REPORT ON PROCEEDINGS BEFORE

PORTFOLIO COMMITTEE NO. 7 - PLANNING AND ENVIRONMENT

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

CORRECTED

At Parliament House, Macquarie Room, Sydney on Monday 2 November 2020

The Committee met at 9:15.

PRESENT

Ms Cate Faehrmann (Chair)

The Hon. Mark Buttigieg
The Hon. Ben Franklin
The Hon. Mark Pearson (Deputy Chair)
The Hon. Penny Sharpe

PRESENT VIA VIDEOCONFERENCE

Ms Abigail Boyd
The Hon. Shayne Mallard

CORRECTED

The Hon. MARK PEARSON: Welcome to the second of five hearings to be conducted by Portfolio Committee No. 7 - Planning and Environment into the rationale for and impacts of new dams and other water infrastructure in New South Wales. Before I commence, I acknowledge the Gadigal people, who are the traditional custodians of this land. I also pay respect to the Elders of the Eora nation past, present and emerging and extend that respect to other First Nations people present. Today we will hear from environmental researchers, followed by representatives from conservation groups. We will also hear from the peak farming body and other research groups. Before we commence, I will make some brief comments about the procedures for today's hearing. Today's hearing is being broadcast live via the parliamentary website. A transcript of today's hearing will be placed on the Committee's website when it becomes available.

Parliament House is now open to the public. All visitors, including witnesses, are reminded that they must have their temperature checked and register their attendance in the building via the Service NSW app. All witnesses have a right to procedural fairness, according to the procedural fairness resolution adopted by the House in 2018. I remind everyone here today that Committee hearings are not intended to provide a forum for people to make adverse reflections about others under the protection of parliamentary privilege. I therefore request that witnesses focus on the issues raised by the inquiry's terms of reference and avoid naming individuals unnecessarily. There may be some questions that a witness could answer only if they had more time or with certain documents at hand. In those circumstances witnesses are advised that they can take a question on notice and provide an answer within 21 days.

JAMIE PITTOCK, Professor, Fenner School of Environment & Society, Australian National University, before the Committee via videoconference, affirmed and examined

The Hon. MARK PEARSON: I welcome our first witness, Professor Jamie Pittock. Would you care to make a brief opening statement?

Professor PITTOCK: Thank you. I have researched water management for nearly three decades, particularly in the Murray-Darling Basin. My comments are a combination of bouquets and brickbats for the New South Wales's Government's proposed programs. In relation to the Western Weirs Program on the Darling River, the 29 weirs along that river are in a dilapidated state—in many cases, in need of repair or removal. Sadly, the communities along the river there have not enjoyed adequate potable water supplies. It is in the public interest, in my view, that the people living in any community in western New South Wales have access to adequate domestic water supplies. There is a real opportunity with the New South Wales Government's proposed Western Weirs Program to review those weirs and to provide alternative water sources for those towns to reduce the environmental impact and ensure people have decent drinking water.

In terms of the Wyangala Dam raising project, I am frankly puzzled that WaterNSW has rushed this proposal without any adequate consideration of the [inaudible]. There is virtually no dividend for the people of New South Wales in this project. What the dam raising might give in terms of irrigation water, it takes away in terms of disadvantaging the people downriver who rely on that river for the beneficial inundations for things like groundwater recharge, for pastoralism and, of course, the environment. There is an obvious alternative that provides a triple dividend. My understanding is that investing in refurbishment of the inefficient irrigation schemes in the Lachlan Valley would provide more water for different users at around one-third of the price and have very little environmental impact, nor disadvantage communities further downstream.

Like with most dam proponents globally, the [inaudible] has studied and reported on this. Many dam proponents try to inflate the benefits of their proposals by tacking on every conceivable benefit that often does not exist. In this case, there are unfounded claims that raising Wyangala Dam might improve town water supply and might aid flood mitigation. These, of course, are community service obligations that, under national and New South Wales policy, might receive some public subsidy. Our concern—my concern—is that raising Wyangala Dam would mean that there would not be a true user-pays approach to this very expensive project to provide further irrigation water when there are more beneficial alternatives. I will leave it there, Mr Pearson. Thank you for that opportunity.

Ms ABIGAIL BOYD: Thank you, Professor Pittock, for coming along and giving us the benefit of your wisdom this morning. The Wyangala Dam has been there for some time, has it not? What have you already seen in terms of its environmental impacts downstream?

Professor PITTOCK: Dams in this part of New South Wales are designed to catch and hold small or medium-sized floods and to store that water for later release. Those small or medium-sized floods are beneficial for the ecology and for a number of human uses. They would enable, for example, the retention of wetlands in places like [inaudible] forests when they spill over the riverbanks onto the flood plain. They also enable things like recharge of groundwater and growth of pastures. Every time a dam captures a flood like that, there is a trade-off: It collects water for irrigation, but the pastoralists and others miss out. There has been some shrinking already of the extent of wetlands in the valley because of Wyangala Dam. The proposed increase would greatly accelerate that. The reason is that raising the dam and increasing its capacity by 53 per cent would capture higher flood peaks. Those higher flood peaks fill up the river channel, spill over the riverbanks and sustain around six nationally significant wetlands downriver, as well as the pastoral communities, as well as the native fish that are the backbone of some of the tourism, as well as pastoral communities and Indigenous communities.

Ms ABIGAIL BOYD: I understand that the environmental impact statement [EIS] for the expansion did not include impacts downstream. Is that correct? Is that usual?

Professor PITTOCK: Actually, the dam has been announced by the New South Wales and Federal governments before any draft EIS has been released for public comment. So far the only public documentation of any note is WaterNSW's referral of the proposed project to the Federal Government under the Federal Environment Protection and Biodiversity Conservation Act. That documentation was lacking in all manner of detail that you would anticipate of any sensible project proponent. There was no hydrological modelling to see if the dam would actually fill regularly enough to make the increased capacity worthwhile. In the past 20 years the current dam has only filled twice or three times depending on how you count it.

The referral documentation did not include any details of the potential downstream impact. In fact, it made a rather unsubstantiated statement that because downstream ecology had already been impacted by the

existing dam that there would unlikely be further changes. Now, there are 470,000 hectares of flood plain wetlands downstream from that river. They are sustained largely due to unmanaged spills when the current dam fills up and spills. If those spills are now controlled there would be quite severe impacts on things like native fish populations, on the breeding of colonial waterbirds, or on the habitat of migratory waterbirds that Australia is obliged to protect under treaties with countries like Japan and South Korea and China. [inaudible] mentioned would have negative economic consequences in terms of reducing things like water recharge and the pastoral production.

Ms ABIGAIL BOYD: Could you explain to the Committee what Australia's international obligations are in terms of waterbirds?

Professor PITTOCK: Australia is a member of a number of treaties that are relevant to [inaudible] our flood plains. Australia has signed a number of bilateral treaties with Asian nations to protect shorebirds that are migratory from North Asia to Australia. While they are called shorebirds, a great many of them find their habitat in the flood plain wetlands of the Murray-Darling Basin, and these are birds that fly tens of thousands of kilometres each way to get to Australia and back. Australia has also signed the Ramsar Convention on Wetlands, which obliges all member states to conserve all wetlands. Although there are no specific wetlands designated in the Lachlan Valley at this time as Ramsar wetlands of international importance, the treaty actually obliges us to conserve all wetlands and manage them wisely.

There are some really significant wetlands in the valley that depend directly on inundation from the Lachlan River. They include, for example, the Booligal Wetlands that are very important for colonial waterbird breeding. The terminal wetlands, the Great Cumbung Swamp, which was recently acquired by The Nature Conservancy, Tiverton Agriculture and the Nari Nari nation, is the largest reed swamp and the largest red gum forest in Australia, and so these are very significant places that would be negatively affected were water to be captured by a higher dam.

The Hon. MARK PEARSON: Has there been a situation elsewhere in the world where waterbirds have lost these areas of water which they would migrate to? What actually happens to those animals if they fly to what they expect to be an area where they can feed and water and breed from a long distance? What happens when they cannot find that?

Professor PITTOCK: Sadly, we are already seeing that with the very waterbirds we are talking about. Because of extensive coastal development at [inaudible], many of the wetland mud flats that these migratory birds depend on have been lost and so bird numbers have been declining. So the birds depend on these wetlands to fatten up to get enough energy to fly all the way back up to North Asia and if that habitat is not there then fewer of them will be able to do that.

The Hon. MARK PEARSON: Are you saying that many birds would die from starvation and dehydration?

Professor PITTOCK: That is the risk, yes. We are seeing progressive habitat loss all along the flyway, including in Australia. I hope that you may have the opportunity to hear from Professor Richard Kingsford who has been undertaking annual aerial surveys of these birds for several decades and he can provide detailed evidence of the current state of numbers. My understanding is that they have declined significantly and the waterbird numbers have not significantly improved despite the Murray-Darling Basin Plan and the purported reallocation that is more in drum with the water.

Ms ABIGAIL BOYD: In your submission you state that the New South Wales Government claimed in its referral for Wyangala Dam that it does not consider the impact of migratory species to be significant. Is that correct? It sounds pretty extraordinary.

Professor PITTOCK: Yes, that is correct. I do wonder whether this comes down to an issue under the New South Wales Biodiversity Conservation Act about how the impacts of a development are regarded as direct or indirect. If the impacts are regarded as direct or classified as direct there would be obligations, I believe, under New South Wales regulations for WaterNSW to provide offsets for lost habitat and species. When you are talking about up to 470,000 hectares and many threatened species, that offset cost would be huge, and therefore I wonder if the intention here from WaterNSW is to try and have these impacts regarded as indirect so that they may avoid paying for such offsets.

Ms ABIGAIL BOYD: I am reading your submission again. You say the difference between flood damage from managed and unmanaged flows [technical malfunction], can you explain to us what you are getting at with that?

Professor PITTOCK: Absolutely. At the moment if there is a large rainfall event and a dam fills and spills then legally that is classified as an act of God, and should a landholder happen to have planted a crop on a

low-lying paddock next to the river and it gets flooded and destroyed then that is an act of God and they are not going to benefit from any compensation. The alternative—and the governments have promoted this in the Murray-Darling Basin Plan—is that environmental water is stored in the dam and deliberately released by a State government to mimic natural floods. The drawback is that the New South Wales and Victorian governments have argued that a managed flood release—that is, a release of water that fills up the river channel, spills over onto the banks and is below the Bureau of Meteorology's minor flood level, so only inundating highly flood-prone land—is not an act of God and landholders who suffer any damages may be liable for compensation.

So the alternative approach adopted—agreed to but not implemented—by the New South Wales and Victorian governments for rivers like the Murrumbidgee, Murray and Goulburn is to purchase flood easements or equivalent permissions from landholders to pay landholders for the ability to inundate their flood-prone land once every two to 10 years. That is an expensive approach—necessary but expensive. For the other six rivers, the estimated cost of doing that is $860 million based on State Governments' business cases. I am not seeing the New South Wales Government proposing anything similar in the case of the Lachlan River for Wyangala to enable any environmental impacts from raising the Wyangala Dam to be reduced by releasing managed flows. Plus the cost of purchasing those permissions from landholders would be very high.

Ms ABIGAIL BOYD: So if the Government says that this dam is really about flood mitigation, what are the other ways that we can manage that in the Lachlan Valley?

Professor PITTOCK: Firstly, the Government has made the case that more flood mitigation is needed. I note that there are three existing New South Wales State Government flood plain management plans for the Lachlan Valley dating from 2005, 2011 and 2012. I cannot find any public document where the State Government has assessed the effectiveness of those plans, or even reported on their implementation. So if there is a major problem, it is not in the public record. When you look at those plans, a number of the reasons for severe flood damage that are mentioned are things like the Stockinbingal to Forbes railway embankment, which is part of the Inland Rail route. I cannot find any evidence that the State Government has asked the Australian Rail Track Corporation to build into that upgrade of the rail track any further culverts or so forth to reduce the flood damage.

It had been reported that one of the purported flood damage problems was the inundation of the Newell Highway in 2016. Yet when I go to Transport for NSW's website and look at their 2015 Newell Highway upgrade program, while it does talk about flood mitigation measures it does not do so for the Lachlan Valley. There is also a project cited on that website directed at reducing flood impacts to the Newell Highway, such as raising the highway on an embankment. So really I cannot find any evidence from any New South Wales Government document that provides a case that flooding in the Lachlan Valley is a problem that justifies a $650 million dam.

Ms ABIGAIL BOYD: In addition, on page 5 of your submission you mention that the New South Wales Government may be required to purchase water entitlements for the environment to compensate for the lack of the proposed 21 gigalitre increase for Wyangala. Could you explain that to the Committee, please?

Professor PITTOCK: Like all rivers in the Murray-Darling Basin, under the basin plan the amount of water that can be diverted under water entitlements is capped, so there is a sustainable diversion limit in place for the Lachlan Valley.

The Hon. MARK PEARSON: Excuse me. Ms Boyd, have you got your microphone on mute? There is feedback coming through. Professor Pittock, please continue.

Professor PITTOCK: The purpose of the dam is to store floodwaters to then enable more water to be diverted for irrigation. The idea is to increase diversions by 21 gigalitres per year on average. The current amount of water diverted in the Lachlan is difficult to ascertain precisely and is below the sustainable diversion limit. Should in an average year more water be diverted from the Lachlan and exceed that sustainable diversion limit, then I have correspondence from the Murray-Darling Basin Authority that says that New South Wales would be obliged to purchase water entitlements to reduce the annual take of water below the sustainable diversion limit again.

There are two other elements to this question. As you may know, water in New South Wales Murray- Darling Basin rivers for into two buckets. One is the so-called held environmental water—water that is legally entitled primarily for irrigation, but also for towns and the environment. And there is the so-called planned environmental water—the water that has not been allocated to a specific user and is intended to sustain the river in terms of enabling conveyance of water, improve water quality and for other environmental purposes. Under the National Water Initiative and under the prerequisite policy measures in place in the plan, that planned environmental water is to be legally protected.

It is unclear whether the difference between the amount of water currently diverted on average each year from the Lachlan and the sustainable diversion limit is actually legally planned environmental water. In the subsidiary water resource plan that the New South Wales Government has submitted to the Commonwealth for approval—the Commonwealth is currently assessing it and it is not yet approved—it proposed a change to the definition of "planned environmental water" that may enable it to claim that any gap between current take and sustainable diversion limit is available for further take for irrigation water.

The Hon. MARK PEARSON: You say that WaterNSW has sent in a proposal to the Federal Government for approval under the Environment Protection and Biodiversity Conservation Act, how is that possible if the information and details that you say are lacking at the moment are not provided?

Professor PITTOCK: That is possible because WaterNSW at that point was simply asking for the Minister to decide what manner of environmental impact assessment should be undertaken by the Federal Government, ranging from approval of preliminary documentation through to a full public inquiry. The Federal Government has accepted a minimum amount of information simply to decide the mode of the assessment decision. The Federal Minister decided that the project would be declared a controlled action under the Act, meaning that perhaps it would have to undergo an environmental assessment and the Minister would make an approval decision. She agreed that, under the bilateral assessment decisions of the EPBC Act, the assessment would be led by New South Wales in the form of an environmental impact statement. My understanding is that the New South Wales planning process will take the lead in the EIS assessment, and when that has been undertaken and New South Wales has taken a decision the Federal Minister would take a separate decision based on the same documentation.

The Hon. BEN FRANKLIN: Thank you, Professor Pittock. The Committee really appreciates having your broad expertise in this area to assist us. Both the Commonwealth and the New South Wales water Acts prioritise water for critical human needs, could you define what you consider to be critical human needs?

Professor PITTOCK: Critical human needs have been largely defined by governments as the water needed for domestic water use by people living in these dwellings. So town water supply, domestic take for those not on town water systems and what is often called stock and domestic—the water required to supply farmers to allow them to water their livestock.

The Hon. BEN FRANKLIN: Do you consider that it should or does include water for employment and jobs as well?

Professor PITTOCK: Irrigation water is not classified by the New South Wales and Federal governments as critical human needs. In regular times, when there is ample water available, the priority that both the State and Federal governments assign is first to the environment, then to domestic and stock and lastly for irrigation. In times of water scarcity, a priority is afforded to stock and domestic. In the case of this dam, the point I would make is that there is no issue in terms of making more water available for irrigation because there is an alternative that would provide that. The alternative that the State Government does not appear to have assessed so far is investment in upgrading the irrigation infrastructure in the Lachlan valley.

The Lachlan irrigation systems missed out on the billions of dollars that have been made available to upgrade irrigation systems elsewhere in the Murray-Darling Basin following the adoption of the Federal Water Act. The reason is that there were some initial large environmental water purchases in the Lachlan, so the environmental water targets were achieved earlier than other river valleys in the Murray-Darling Basin. Consequently, the Federal Government decided to [inaudible] irrigation infrastructure upgrade funds available elsewhere in other valley and less so in the Lachlan. The Lachlan has largely missed out.

The Hon. BEN FRANKLIN: Sorry, professor, I was not actually asking about irrigation. I was trying to ask about other industries that basically are important for employment and so forth—abattoirs and things like that. Do you consider those as part of critical human needs?

Professor PITTOCK: Personally, I would in terms of abattoirs being next to things like town water supplies and further agricultural processing industries. Absolutely. They are very important for sustainable jobs.

The Hon. BEN FRANKLIN: And other industries that might be related to town employment and so forth.

Professor PITTOCK: Yes.

The Hon. BEN FRANKLIN: Regional communities like Tamworth are obviously looking at population growth and projection targets. Do you think it is reasonable and realistic for them to have those sorts of projection targets that are being discussed?

Professor PITTOCK: I am not so familiar with the area up around Tamworth. I could not comment on the Dungowan or Mole River proposals—

The Hon. BEN FRANKLIN: Sorry, this is a little bit more challenging because of the virtual nature of it. Nonetheless, just to assist, Tamworth has a plan for a population of 100,000 by 2041.

Proferssor PITTOCK: In general I think it is very important that we as a society support vibrant towns, cities and communities in western New South Wales and in places like Tamworth and provide for adequate domestic water supplies. I would note that, in most of these alleys, the proportion of water required to support that is very small in proportion to the total water available. For example, in the Lachlan valley the water utilities hold 2 per cent of the water entitlements, so the needs for those domestic town utility water supplies can easily be met from the current resources if the total water resource is well managed.

The Hon. BEN FRANKLIN: What about during years of extreme drought? Does that still hold then?

Professor PITTOCK: Well, yes, it does. I would draw your attention—I hope you may have the opportunity to talk to Professor Kingsford about his recent academic paper "The human dimension of water availability" just published in the *Journal of Hydrology*, where he looked at the different water management approaches applied by WaterNSW, comparing river valleys like the Lachlan and Macquarie on the one hand, which operate on a credit water allocation system, versus a valley like Gwydir on the other hand, which operates on a debit system. In the Macquarie and the Lachlan, WaterNSW has decided to release water from storages that comprise the stored water plus their estimate of future inflows so, as you head into a dry year—as we have in the last two or three years—more water has been released from the dam than has flowed into the dam. It is essentially operating the dams like a credit card.

For upper river valleys like the Gwydir, WaterNSW has only released the water that has been stored. Now, WaterNSW calculations have relied on historical low levels of water inflows but, like the levers the New South Wales Parliament has discussed, the New South Wales Government made a change to not include the inflows from the years during the millennium drought, so the very conservative approach that was taken has been diminished. In terms of supplying town water in valleys like the Macquarie and the Lachlan, one way of improving liability of town water supply would be to change from this credit system of issuing water to a debit system, which would keep more water in storage for best reliability for domestic water supply.

The Hon. BEN FRANKLIN: Okay. In terms of the point that you made before about the New South Wales Government, I am not sure that is totally true. We actually removed carryover water from irrigation and used it for towns and running the river. For example, you have got to have 170,000 megalitres, as you know, to run the Lachlan river each year.

Professor PITTOCK: Indeed.

The Hon. BEN FRANKLIN: Can we move to the water infrastructure that is needed to ensure growth in regional cities across the basin? What infrastructure do you think is needed in cities like Orange, Dubbo, Queanbeyan, Albury and Bathurst? How can that be achieved and what needs to be done in your perspective, professor?

Professor PITTOCK: One of the things that I think is very good about what the New South Wales Government is doing are these regional water strategies. The first of those was released for public comment just after submissions closed to your inquiry. In those regional water strategies, a whole lot of different water options are set out in each of the valleys. In the case of the Lachlan, which is the one that I have looked at in great depth, it proposes a whole set of measures to improve reliability of town and city water supply. Many of those are very sensible and have very little environmental impact. They include things like further pipelines to network the water storages and increasing the water recycling rate.

In the Lachlan valley it is currently around 50 per cent and clearly there is a lot more water that could be obtained by extending that. They talk about more conjunctive use of groundwater, so better managing groundwater resources to supply towns during drought. Then they suggest managed aquifer recharge, which would top up these groundwater resources. I think those are all four very positive measures that could come out of these regional water strategies.

The Hon. BEN FRANKLIN: Can we move to what happens when the flow is low and in drought situations and so on? Some citizens, groups and so on in Tamworth have suggested that when Chaffey Dam, for example, hits 20 per cent, all water, including environmental water, should be switched off, the Peel River should be allowed to run dry and then the water to Tamworth supplied via a pipe from the dam. What is your response to a suggestion like that, professor?

Professor PITTOCK: Well, certainly critical human needs would suggest that domestic water supply for towns like Tamworth should come first. I do think there is an urgent need in the Murray-Darling Basin for both State and Federal governments to plan for climate change and further potential reductions in water availability. As you are probably aware, the Murray-Darling Basin Plan currently does not have any direct provisions for adjusting to climate change impacts. There will be tough choices to make in the future with less and less water between water for irrigated agriculture, the environment and for other uses. I think that the sooner that we start as a society to think through those projections and plan and adaptation pathway, the better we can support regional New South Wales.

The Hon. BEN FRANKLIN: You have obviously done an enormous amount of work in this field. To broaden the question slightly, do you have a view on what trigger points should be used as to when rivers should be allowed to run dry?

Professor PITTOCK: No, I have not examined that particular question. I do think, again, that rivers running dry will occur more and more frequently, particularly in the southern part of the Murray-Darling Basin as the climate changes and we do need as a society to have a new generation of water plans that address that very question to try to reach agreement before it happens.

The Hon. BEN FRANKLIN: And when the rivers run dry, with that include cutting wetlands off as well?

Professor PITTOCK: Well, inevitably yes. So, clearly, in severe historical droughts prior to British occupation, rivers occasionally did run dry. The argument has always been that Australia's plants and animals are adapted to such dry times and will bounce back when it rains. The issue that we are now facing is that those dry spells are increasing in length and frequency due to both diversions for human use and likely due to a changing climate.

So, at some point the particular plant and animal species will not be able to survive those increasingly frequent or longer dry periods. As an example, many of the colonial waterbirds need to only live for 10 to 15 years and they only breed when the water inundates under the floodplain forest trees they nest in above a certain depth for a longer period of time. If those conditions become increasingly infrequent and they cannot breed, we will lose those bird species. So, as a society, we will have to decide: Do we value that sufficiently to release more environmental water to keep the species alive, or do we sacrifice those in the name of supporting, for example, agriculture?

The Hon. BEN FRANKLIN: To me, one of the quintessential issues of this inquiry is obviously the value of dams. I would have thought that having dams are actually often prolongs river flows and without them often they would go dry quicker. Do you agree with that?

Professor PITTOCK: Yes. Dams can be used to sustain the flow of a river. That is not necessarily environmentally beneficial. So, for example, in the case of the River Murray, the river naturally would have very high flows of late winter and spring and then low flows in late summer and autumn. The ecology is adapted to those highs and lows. Now, because of the dams, the river is run essentially bank-full much of the year. That is very environmentally damaging. It is leading to things like riverbank erosion. It means that native fish are missing their cues to breed and to spread out and there is a trade-off that means there is water not going onto the floodplain to recharge groundwater to keep red gum floodplain forests alive and so forth. So there is a trade-off if you keep rivers running the same way all the time.

The Hon. BEN FRANKLIN: But I mean we obviously need complementary measures to get, I guess, the best bang for our buck. You are not suggesting we should cut Adelaide off, I assume.

Professor PITTOCK: No. I do have a certain fondness for Adelaide so let us not cut Adelaide off, but there are important measures we can take—

The Hon. BEN FRANKLIN: Yes.

Proferssor PITTOCK: —and that we are not taking that we should. And I think that the $650 million, for example, proposed to raise Wyangala would be much better directed at a range of alternative measures—

The Hon. BEN FRANKLIN: Understood. I just want to pick up an issue about fish breeding that you just raised in the previous answer. We actually heard from some witnesses at the last hearing that one of the main concerns with the western weirs project is the potential to damage fish breeding habitat by interrupting normal water flows. Do you agree with that contention? If so, how can we design the system to avoid that occurring?

Professor PITTOCK: Yes, I do agree with that contention. Fisheries NSW have done exemplary work in auditing all of the infrastructure that crosses rivers in New South Wales and have identified the impacts that

they cause and some potential solutions. There are a number of solutions. A lot of the weirs in rivers, for example, were built to do things like supply the water to steam trains and are redundant or unsafe and could be removed. Most weirs were built before there was the current knowledge that we have to do things like build fish passage devices on them so that fish can—so some of our most iconic fish like Murray cod and trout cod are migratory and we need to be able to enable them to move up the rivers to breed. And then I think that in a dry climate we would be wise to diversify our water resources by looking to do things like better manage our best reservoirs, our groundwater aquifers and looking at things like manage aquifer recharge to improve water supply reliability in a sound fashion.

The Hon. BEN FRANKLIN: I just have a final broad question: Do you think it is feasible to maintain connectivity within rivers during times of drought? If so, how do you do it without infrastructure, or could you do it without infrastructure such as dams and weirs?

Professor PITTOCK: In historical droughts it should be possible to maintain adequate connectivity. In a drying climate, and with the level of water take, it is becoming increasingly difficult. There are trade-offs, as you have mentioned, between having reservoirs that can release base flows to flush rivers, to keep them flowing, to remove salt, to prevent blackwater events versus free-flowing rivers. I have published academic research that I have used that our best way forward is to legally protect our remaining free-flowing rivers, which provide a certain degree of conservation with some of the risks that you have outlined. So, that would mean, for example, legally protecting the rivers in New South Wales like the Talbragar and the Paroo whereas we need to look at our regulated rivers like the Lachlan and ask ourselves: How can we retrofit them to reduce the impacts?

New South Wales has done a great job in leading with cold water pollution mitigation. Bizarrely, the cold water let out of large dams often prevents native fish, for example, from breeding up to 300 kilometres downriver. New South Wales built some of those sorts of devices on dams but there are many more dams that do not have them yet. But New South Wales researchers have led the way in looking at things like how to screen pump uptakes to stop sucking fish up into the pumps. It would be great to see wider adoption across the State of those sorts of measures.

The Hon. MARK PEARSON: We will now move to the Opposition for questions.

The Hon. PENNY SHARPE: Professor Pittock, I was very taken by the comments made in your submission regarding the number of inquiries, plans and assessments being done on the Lachlan Valley that do not seem to feed into this process, which is the dam proposal. I am wondering if you can take us through the time frames and where you understand these things are up to. The first one is the Lachlan Water Resource Plan under the Murray-Darling Basin Plan. I understand it has been submitted to the Commonwealth Government but has yet to be signed off. Is that correct?

Professor PITTOCK: Yes. The Lachlan Water Resource Plan under the Federal Water Act has been submitted to the Murray-Darling Basin Authority for assessment. My understanding is that the authority is looking to advise the Minister on whether to accept it or not, towards the end of this year, and that it has not yet been accepted or adopted.

The Hon. PENNY SHARPE: When you say "accepted", I am not familiar with the ins and outs of the negotiations between the State and Commonwealth in relation to these, is there a bit of toing and froing around acceptance? Do they go back to the State to ask for more clarification about questions, or is it just that it is submitted and the Commonwealth either ticks off or not?

Professor PITTOCK: That process is not detailed in the Federal Water Act. My understanding is that there is some dialogue between New South Wales authorities and the Murray-Darling Basin Authority. I am not aware of what opportunities there are for New South Wales to amend the draft plan that they have submitted. In the Federal Water Act really the Federal Government only has this nuclear option, which would be now formally not to accept a New South Wales plan and to write one themselves, which would be—

The Hon. PENNY SHARPE: Highly unusual?

Professor PITTOCK: Yes.

The Hon. PENNY SHARPE: In relation to the Wyangala Dam raising, the time frame for New South Wales submitting the Lachlan Water Resource Plan, where would it have fitted in the time frame of the Commonwealth announcement about Wyangala Dam and the New South Wales Government announcement about Wyangala Dam? Are we out of step with that plan, or do you think it has been captured in some way?

Professor PITTOCK: I could not answer that with precision. My understanding is that the water resource plan that has been submitted does not include provisions for the Wyangala Dam raising that WaterNSW argue, that is that the higher dam is consistent with the plan.

The Hon. PENNY SHARPE: That is because they maintain the position that the caps remain the same and everything that they do within that falls—that is the essential argument, is it not?

Professor PITTOCK: Yes, exactly.

The Hon. PENNY SHARPE: Then we go to the draft Lachlan Regional Water Strategy. That is a State based strategy. You commented previously that you thought that was something that the Government was doing well. There has been a draft strategy but it has not yet been released for public comment. Does that need to happen before it gets—I am unclear about who signs off on that and where the public commentary is about that?

Proferssor PITTOCK: The draft Lachlan Regional Water Strategy has been released by the New South Wales Department of Primary Industries and Environment. That was released several days after submissions closed for your inquiry. It is available for public comment now for a couple of weeks, along with similar draft water resource strategies for some other valleys in the basin. My understanding is that the New South Wales Government is intending to finalise those draft strategies early in the new year. That strategy includes 48 different water management options for the Lachlan Valley. As I stated in my supplementary submission, some of those options are most commendable and would be a great step forward. I have mentioned some of them, things like screening irrigation offtake pumps to keep fish in the river, managed aquifer recharge for towns. Others of those options would be most environmentally retrograde and I do hope that they are not adopted.

The Hon. PENNY SHARPE: The Wyangala Dam raising is one of the 48 options, is it not?

Professor PITTOCK: That is correct, yes. It is only one of 48 options. I guess I am rather surprised that the State Government, has announced, says it is going ahead with the Wyangala Dam raising, when the broader strategy that sets that context has not yet been finalised.

The Hon. PENNY SHARPE: Which leads me to the third look at what is happening, remembering this is all the same water, the New South Wales Lachlan water sharing plan has not been finalised. Can you tell us where that is up to as far as you know?

Professor PITTOCK: I am not up to date with that, Ms Sharpe, but I understand the State legislation a separate water sharing plan is required and has not yet been finalised.

The Hon. PENNY SHARPE: Do you know when it is due? If you do not know, that is fine.

Professor PITTOCK: I do not know, I am sorry.

The Hon. PENNY SHARPE: Each of these plans is very important, they have quite separate purposes but they are all dealing with the one amount of water going to the same places. The Committee had evidence last week that on some of these there has been some very good public consultation and input, particularly from First Nations people who said they actually had quite a good consultation over some of these issues, but there is a level of frustration that, having participated in all of these that all of a sudden it is like, we have really only got one option and that is Wyangala. Do you think it is possible, understanding that bureaucracy is difficult and water bureaucracy is complicated, there is the ability to bring all these into alignment before the Government finalises just putting out the environmental impact statement [EIS] to include all the input from these processes?

Professor PITTOCK: Certainly my recommendation to the New South Wales Government would be to finalise the regional water strategy first to seek community agreement on what are the reforms the community genuinely wants and makes sense in the Lachlan Valley before making any decision on the Wyangala Dam raising. I advocate that the Wyangala Dam raising project be put on hold. If I could draw your attention to one other report that I believe exists but I have been unable to get a copy of thus far. In 2009 I understand the Commonwealth Government undertook an assessment, commissioned an assessment of the potential for irrigation water efficiency in the Lachlan Valley. I am currently seeking a copy of that report from the Federal Government. If I do obtain that I would forward that on to your Committee. I am sure that the New South Wales Government must hold a copy of that report.

The Hon. PENNY SHARPE: This was 2009, is that right?

Professor PITTOCK: Yes.

The Hon. PENNY SHARPE: And this was the report that basically said that upgrading the irrigation infrastructure in the Lachlan Valley could serve around 25 gigalitres and in 2009 dollars was around $170 million?

Professor PITTOCK: Yes.

The Hon. PENNY SHARPE: It is nowhere to be found, is that the case?

Professor PITTOCK: Yes.

The Hon. PENNY SHARPE: That is something that our Committee could ask for.

Professor PITTOCK: I think that would be useful. I think that would be a great alternative that would provide a triple benefit. If the Committee wants to defend, protect and promote regional New South Wales, then that would mean that the irrigation industry in the Lachlan could be upgraded to become as productive as its competitors in other parts of the Murray-Darling Basin. It would generate work that could be undertaken by businesses more local to the Lachlan Valley, compared to the sorts of big engineering firms in capital cities that would undertake the Wyangala Dam raising project. And, of course, the irrigation efficiency upgrades would be cheaper and leave funds available to pursue some of the more sensible other options for the New South Wales Government's Lachlan regional water sharing plan.

The Hon. PENNY SHARPE: I was fascinated by some of the evidence you gave to the Hon. Ben Franklin about the Murray-Darling Basin Plan. It sounds to me—I am checking that I am understanding this—that the irrigators and others did a lot of work early on in the Murray-Darling Basin Plan and essentially met their targets very early. The perversity of that then meant that their good work was not rewarded and they then missed out on the issues such as the irrigation money that flowed, perhaps to places where they had not done as well. Is that a reasonable way of describing what has happened there?

Professor PITTOCK: Essentially, yes. The Federal Government made some very large purchases from one major agricultural water user in the Lachlan Valley and that dramatically reduced the amount of environmental water recovery required and that has had the perverse impact of reducing further Commonwealth investment in that water catchment in the Lachlan Valley. So there is now this potential for irrigators in the Lachlan to benefit were that to be revisited.

The Hon. PENNY SHARPE: That sounds very sensible to me. Can I just ask you about the Western Weirs Program? I was again interested that there has been work done in 2000—that is 20 years ago now so I accept that it may be a little bit out of date—but there has been work previously done around water supplies for those small towns in the Far West: Pooncarie, Tilpa, et cetera. You said $2.7 million—for between $5 million to $10 million, that is being generous, you could get quite a lot of bang for your buck with those very small towns. I want you to comment on that but I also want you to comment on the basis of what we know now 20 years on about drought and climate change, does that study still stack up or would you have to have another serious look before you could examine it properly?

Professor PITTOCK: That study was commissioned by World Wide Fund Australia and used a water engineering firm PKK to examine alternative water supplies for small rural communities, towns in western New South Wales that would enable the environmental impact of the town weirs to be reduced. I actually think that report is even more valid today for a number of reasons. One is that with the diminished reliability of flows down the Darling River the water supply for towns like Tilpa and Louth has become even more tenuous, both in terms of volume but also in terms of declining water quality. I think it is critical that we diversify the water supply options for those towns.

That study looked at a number of options, including greater use of groundwater, including active managed aquifer recharge opportunities in some of the towns further east, looking at pumped off river storage that is an opportunity to store more water of higher quality for longer. And the cost per town ranged from hundreds of thousands to, as you say, a couple of million dollars in 2000 dollar terms. I think there are some really important opportunities there to improve the lives of people living in small towns in western New South Wales to ensure that they have decent quality drinking water to support the basic economic functioning of those towns and that would be a great investment.

The Hon. PENNY SHARPE: I have got one more question. It is about the NSW Wetlands Policy and how that fits with the Environment Protection and Biodiversity Conservation Act and the oversight through the planning process for these projects. No-one has really been able to answer this question for me. New South Wales is committed under the various treaties around migratory birds, and you have gone through that in detail so I am not going to revisit that. We also have a NSW Wetlands Policy, which I understand falls under the Minister for the environment.

My question is when looking at the projects that the New South Wales Government is currently looking at and the impact on wetlands—which is significant—are you aware whether there is a concurrence power in terms of the environment Minister overseeing this or is there a requirement to consult? I suppose it is really in the architecture of decision-making the NSW Wetlands Policy sits with the Minister for environment but what role does it actually play in being able to get consideration of these matters through the planning process?

Professor PITTOCK: I am not familiar with the answer to that question, Ms Sharpe. I apologise.

The Hon. PENNY SHARPE: That is okay. No-one has been able to answer it. I just thought I would give you an opportunity. You may know as you look at these things in detail. Thanks.

The Hon. MARK PEARSON: Any further questions from the Opposition?

The Hon. MARK BUTTIGIEG: Professor, you touched on this earlier in evidence. I suppose it comes down to the crux of the matter and we did hear about it last week. I suppose at an intuitive level the basic political calculation is that most people can make the logical connection between raising dam walls and therefore capturing more water but that presupposes the same average rainfall perhaps over a longer period of time but more sporadically. You seemed to indicate that is not the case because of climate change. Do we have any data that that is in fact the case because if it is it, I guess, it makes you wonder why we are going down this path?

Professor PITTOCK: Yes, good question. The climate is changing and that means that water infrastructure needs to change as well. You cannot rely on the historical record to look at the future. The risk, for example, of the Lachlan is that reduced precipitation would lead to lower river inflows and a higher dam would fill less often. From the hydrograph in my first submission, on page seven, you can see the current record for Wyangala Dam in terms of how full it is. There is a great deal of evidence that rainfall and inflows in the southern Murray-Darling Basin are declining. There are a number of pieces of evidence from the Southern Tablelands, in the region I live in, where we are already seeing statistically significant declines in rainfall, particularly—not this year—in spring and that is based on Bureau of Meteorology data.

Then unanimity in the academic research that even small declines in rainfall lead to much higher declines in river inflow. That is because of the higher evapotranspiration leading to reduced inflows into the actual rivers. We are already seeing that the yields of various water entitlements are not as high as anticipated, for example, the Commonwealth Environmental Water Office has given evidence that their environmental water entitlements, the yield on those entitlements is not as high as projected. So, I think there is growing reason for concern. A way of spreading that risk, in terms of water supply and water infrastructure, is to diversify the water sources and the water infrastructure used to diversify the risk.

That is one reason why I would say that building more surface water storages, traditional storages is unwise as opposed to complementing the existing water supply with other measures, such as better conjunctive use of groundwater, more water recycling and off river pump storages that are able to retain water for longer. Those sorts of measures are likely to improve our resilience in drought.

The Hon. MARK PEARSON: We have four minutes left so there will be one question each, which will be succinct. If the Professor can keep his answers succinct as well, we will get through the three before time is up. So now we will cross to the crossbench and Ms Boyd.

Ms ABIGAIL BOYD: I think the only thing we have not covered in much detail is in relation to the impacts of the Wyangala Dam proposal on groundwater specifically. Could you just talk us through those impacts, please?

Professor PITTOCK: The groundwater science is not as good as it should be. The mid and lower Lachlan Valley rely a lot on what is known as alluvial aquifers. This is groundwater that sits in the sediments in the upper layers of the geology. Those aquifers recharge in two ways. One is through rainfall directly percolating down through the soil, and the other is when rivers spill onto the floodplains and the groundwater percolates down into the ground in different ways. The precise relationship is not as well documented as it should be, but both WaterNSW and the Murray-Darling Basin Authority in several reports comment on the importance of groundwater recharge from the river. The risk is that if Wyangala Dam is raised, if it spills less often and there are then less inundation events spreading out over onto the floodplain that there is less water then percolating down into the aquifer that supplies the people and the industries in the western portion of the valley.

The Hon. BEN FRANKLIN: Just a bit of a question from left field. Professor, I note that you are from Australian National University. The Cotter Dam, which obviously provides water to Canberra, was rebuilt in 2011 some 20 times larger than the original dam that it replaced. How on earth was that able to happen? How was it able to be built given the Murray-Darling plan was supposed to cap use? Do you have any comments on that?

Professor PITTOCK: Yes. That was rebuilt and raised. My understanding is that Canberra remains within its Murray-Darling Basin cap in terms of water diversions, and in fact that the Australian Capital Territory Government is taking Federal money to reduce water take in the ACT to make efficiencies and return a small amount of water to the river. So the dam—

The Hon. BEN FRANKLIN: They have actually returned some, have they? I did not think they had returned any.

Professor PITTOCK: They have funding to make water use more efficient in the ACT with an intention of returning some of their entitlement to the Basin, yes.

The Hon. BEN FRANKLIN: But they have not yet?

Proferssor PITTOCK: I do not believe that program is complete yet, but I saw a report it was on track.

The Hon. MARK BUTTIGIEG: Professor, in your submission you note that in regards to the Lachlan River valley plans that I think it was $650 million has been allocated to Wyangala with no cost-benefit analysis. I think you have sort of pointed out why that was so important given the other options that may be available for conservation, more efficient use—more bang for buck, in other words. Is it unusual or unprecedented for the Government to go ahead without an adequate cost-benefit analysis to inform the community?

Professor PITTOCK: I find it extremely surprising that there is no public cost-benefit analysis available. I do not know of any other project that would propose to spend this sum of money without some sort of more detailed analysis as to why the benefits outweigh the costs.

The Hon. MARK PEARSON: Thank you very much, Professor Pittock. Your information, your assistance and your contribution have been very helpful. It is much appreciated.

Professor PITTOCK: I appreciate your time.

(The witness withdrew.)

MATTHEW DOYLE, Chairperson, LachLandcare Inc., before the Committee via videoconference, sworn and examined

KEITH HYDE, Deputy Chair, LachLandcare Inc., before the Committee via videoconference, affirmed and examined

JANE PAUL, Conservation Officer, Daroo Landcare, before the Committee via videoconference, sworn and examined

JAMES FITZSIMONS, Director of Conservation and Science, The Nature Conservancy Australia, before the Committee via videoconference, affirmed and examined

ELISABETH DARK, Convenor, Conservation Committee, BirdLife Southern NSW, before the Committee via videoconference, affirmed and examined

The CHAIR: I will now take over the hearing as Chair of this Committee. It is Cate Faehrmann. Thank you so much for joining us. I assume that Ms Paul and Ms Dark are not on mute? The secretariat is trying to call you. Mr Doyle or Mr Hyde, which of you is making an opening statement?

Mr DOYLE: Thank you for the opportunity to meet with you today. Thank you to Mr Hyde for helping me write this opening statement on behalf of LachLandcare Inc. LachLandcare Inc. represents landholders, land carers and Landcare groups in the Lachlan Valley, from Gunning in the east through to Lake Cargelligo in the west, at both the regional and State level. We know that landholders further down the river system are members of Western Landcare. Several of our members have made complementary submissions to you. Our primary focus is on sustainable land use, sound environmental management and the social and economic welfare of our community in the Lachlan basin. We believe WaterNSW and this debate in general has become too focused on raising the dam wall and on providing more water to towns and irrigation communities downstream. Their needs for more water are respected; however, water storage and water extraction from the river is just part of a much bigger picture—a much bigger and more complex environmental and social jigsaw in the Lachlan.

Some of our members will be directly affected and stand to lose their best country and infrastructure to flooding behind the dam wall. This is of concern to us. Many more of our Landcare members are affected by the lack of sound, coordinated environmental management in the catchment above the dam, within the Lachlan tributaries feeding water into the river system, and also downstream on the flood plains. In particular, we are concerned that the health of the catchment as a whole is not considered adequately in either the WaterNSW scoping study for the dam or the recently released draft strategy for water management in the Lachlan. The focus is on the dam wall and the area which is to be flooded behind the raised wall. The environmental impact statement [EIS] is focused only on a 10-kilometre zone around the dam itself. The Lachlan catchment is in poor health. The river is in poor health and many reports on erosion in the catchment, sedimentation of the river and water quality for fish breeding etcetera gather dust. Many of these, including the work of the former Lachlan Catchment Management Authority and current Local Land Services regions, are referenced in submissions to this inquiry. They are not referenced by WaterNSW, albeit now in the same mega-portfolio.

Our Landcare members—with financial help from Local Land Services, the national Landcare program and especially the NSW Environmental Trust—are endeavouring to address the catchment health and sustainable land use challenge, albeit in a small way. The catchment is not getting any bigger. It has more people living in it. There are demands for more water and climate predictions indicate more variable rainfall—possibly less rainfall. Catchment health is one of the few manageable factors in the Lachlan water equation for government. We believe it warrants a $10 million per year investment over the next 10 years. It is a big job and it is an important job. In the experience of the Sydney water catchments and the Snowy, it may take up to 20 years, but a decision needs to be made about caring for our environment and a start needs to be made on catchment health for the long run. It would be a small component of the $650 million investment in an extension of the dam and proposed new pipelines to Orange, Young, Boorowa and other inland towns. Thank you.

The CHAIR: Thank you, Mr Doyle. Dr Fitzsimons, do you have an opening statement to make?

Dr FITZSIMONS: I do, thank you, Chair. In 2019 the Great Cumbung Unit Trust, which is the partnership between The Nature Conservancy and Tiverton-Rothwell Agricultural Impact Fund, purchased Juanbung and Boyong stations, which occur at the terminus of the Lachlan River and contain one of the Murray-Darling Basin's most significant wetlands: the Great Cumbung Swamp. This area is one of the largest reed and river red gum wetlands in New South Wales and one of the most important waterbird breeding sites in the Murray-Darling Basin. It is listed under the *Directory of Important Wetlands in Australia* and from preliminary assessment meets numerous criteria to qualify as a wetland of international significance under the Ramsar

Convention. The Cumbung is significant in its ability to act as a refuge when the surrounding landscape is dry. It is home to nationally threatened species listed under the Environment Protection and Biodiversity Conservation Act, including the Australasian bittern and Australian painted snipe. It has numerous important Aboriginal cultural sites and values.

The Great Cumbung Unit Trust operates as a mixed agricultural enterprise and it relies on the health of the Lachlan River and flows to maintain the health of the Great Cumbung Swamp. Raising the Wyangala Dam wall is highly likely to threaten the health of the lower Lachlan, the Great Cumbung and our business. The parlous state of the lower Lachlan is already recognised under New South Wales legislation. The aquatic community is listed as an endangered ecological community under the Fisheries Management Act. Dams, including Wyangala, and altered flow regimes are cited as one of the main threats to this community by the New South Wales Fisheries Scientific Committee. We are concerned that no business case or cost-benefit analysis has been made publicly available to justify the proposal from an economic perspective, nor have other options been considered. The same is true for justification on flood protection benefits being suggested. Why have no hydrological models been released? In summary, The Nature Conservancy and the Great Cumbung Unit Trust have serious concerns about both the real threat that raising the Wyangala Dam wall has on downstream ecosystems, the farming communities and particularly the Lower Lachlan, and also the lack of information to justify this proposal. Thank you.

The CHAIR: Thank you. Ms Paul, you are the representative of Daroo Landcare. Would you care to make a short opening statement?

Ms PAUL: Yes. Daroo Landcare works to protect, preserve and improve the natural environment. The proposal for a re-regulating weir on the Macquarie River at Gin Gin for improvement to water security in inland regions will not be good for the environment or biodiversity. There are examples from many areas of the world of decreasing biodiversity and impacts of dams, weirs, pumping and diversion of rivers that have been acknowledged as a key threatening process in Australia by the scientific committee. They have substantial impacts on native fish and aquatic systems. Significant impacts will be felt in the internationally important wetlands, the Wilgara and Macquarie Marshes. Both wetlands are listed under the Ramsar Convention as wetlands of significance. As such, our Government is charged with the care of these sites, which puts us under a serious obligation to uphold such commitments. The inquiry must give consideration to this.

We are also committed to other treaties, including JAMBA, which is Japan-Australia Migratory Bird Agreement, and ROKAMBA, which is Republic of Korea-Australia Migratory Bird Agreement. Migratory birds that use the marshes for habitat will be significantly impacted if the proposal goes ahead. Other waterbird species, including some that are threatened or critically endangered, will be placed at risk. Significant impacts are expected on frog and fish species, mammals and flora and will lead to further loss of biodiversity. This inquiry gives witnesses an opportunity to express the importance of these issues and the safeguarding of a healthy river. The tributaries—rivers of the Bell, Talbragar and the Little River, also the Coolbaggie Creek—contribute large and small volumes of water to the river below Burrendong Dam.

These natural flows and freshes are critically important to aquatic animals and an important function for river health. Loss of breeding stimuli and recruitment areas resulting from changes to flow will add to losses of biodiversity and deterioration of the ecosystem function. Of importance will be the loss of a registered Aboriginal cultural site: the Terramungamine Rock Grooves, which will be inundated. Too many Aboriginal cultural sites that should have been preserved have already been lost. Decisions made on the issue of the re-regulating weir are informed at the micro level, but issues of such importance must be considered at the macro level to emphasise the importance of our environment, biodiversity and the world's ecosystems.

The CHAIR: Ms Dark, do you have a short opening statement?

Ms DARK: I do. My interest is mainly looking directly at impacts on bird life, although I am also concerned about the other issues. I will speak primarily about the Wyangala Dam, although I am concerned about the other sites, particularly the Macquarie Marshes, which is also an important site for waterbirds and a declared key biodiversity area [KBA]—I can explain what KBAs are later. Upstream the impacts of the Wyangala Dam will be flooding of box gum woodland—a threatened ecological community—so that more than 1,300 hectares of that will be lost through clearing or inundation. Woodland birds are present in that proposed area. A consultant by the name of Tony Saunders has listed birds present within the footprint of the proposed change to the dam. There are 12 present species listed and also other ones which are in decline, or over, and we know about that because of trends in a long-term study of surveying woodland birds around Cowra. That has been going on for over 20 years.

The site is also in close proximity to the south west slopes KBA, which is an ecological hotspot. There are critically endangered birds that are likely to be affected by this development, specifically the regent honeyeater and the swift parrot—400 regent honeyeaters survive in the wild and 2,000 swift parrots. They are on a race to

extinction unless we do better than we have been. They are nomadic, they move widely through the landscape and they are likely to find the eucalypt species in the Wyangala area an attractive food source when they are flowering. There are other species as well, including the superb parrot and the painted honeyeater; both classified as vulnerable.

I am sure other speakers will be talking about international agreements and obligations which we would be contravening by taking actions that would damage those wetlands downstream. The increased dam capacity by over 50 per cent will further reduce the natural flow of the Lachlan River in our drying climate, with severe impacts downstream, including riparian areas and other vegetation communities that require periodic inundation. We know what the impact of that will be decreased river health, algal blooms, fish deaths, decline in the health of trees along those river systems and then bird species that are dependent on those environments will suffer. There are also endangered bird species in those significant wetlands that the Lachlan flows into.

Just a final word: Offsets are measures that are often given as an option to compensate for development, but it is a myth that they are adequate compensation. They often either offer protection of another similar area or propose a revegetation area, but there is still a net loss of whatever that ecological community is and the fact is that regent honeyeaters require hollows in trees more than 100 years old to breed. Various other species rely on mistletoe for food, and Mistletoe is not found in new revegetation sites. In conclusion, I would just say that we have a responsibility to value and conserve our remaining inland natural areas, whether they are woodland or wetland or flowing rivers, so that they can continue to support viable populations of native plant species, birds and other native wildlife.

The CHAIR: Dr Fitzsimons, WaterNSW talks about Wyangala Dam as being necessary, partly obviously for water security but also for flood mitigation. They talk about managing the flood events in the Lachlan Valley as though the floodwaters are a bad thing and need to be held back. Could you please explain what your view is of that and maybe tell the Committee a little bit about the uniqueness of the floodwaters in the Lachlan Valley and of the multiple benefits that you talk about in your submission?

Dr FITZSIMONS: So much of the Murray-Darling Basin ecology is based on a boom and bust system of floods that spill out of the flood plain. Things like river red gum forests and black box forests regenerate after these big events. Much of our waterbird breeding event, for instance, is driven by these big flow events and so the continuing decline of the health of the Murray-Darling is in large part due to river regulation and, to some extent, over-extraction. That is a really critical part of where we are today. One of the key mechanisms that the State and Federal governments are using is to ensure more water goes to the environment these days than perhaps there was 20 and 30 years ago through environmental flows for that specific purpose. We do need to have the ability for flood events to break the banks, to flow onto the flood plain and not just be maintained in the river channel. We are going to see the health and the maintenance of these really important ecological systems into the long term so whatever amount of infrastructure might get put in, the critical thing is to ensure that the flow regimes are maintained to ensure the health of the systems.

The CHAIR: Would Lachlandcare like to comment on that? Mr Doyle, you are nodding.

Mr HYDE: Flooding is a natural phenomenon in the whole of the Lachlan River system, including in all of the tributaries. We have noted in one of the submissions from our members that there is a 150-kilometre sedimentation silting of the Lachlan River between Wyangala and Forbes as part of a Fisheries NSW study for the Central West Local Land Services. Control of flooding also contributes significantly to the sedimentation within the river system and the poor health of the river. Flooding is a natural phenomenon on those plains. It does not happen very often, but it helps to scour out the river and take the sedimentation out across the top of the river levees and out onto the flood plain. So we see it as a fairly natural phenomenon that happens on my farm quite regularly. It is part of the natural process within the whole of the Lachlan Valley. Control of flooding may be necessary for infrastructure, but as a system it is part of what happens naturally.

The CHAIR: In terms of managing the flood risks for infrastructure and communities downstream, are there particular recommendations that the Committee could look at for those?

Mr HYDE: I suspect so, but I am not a water hydrologist, I am an agronomist by training so that is a bit beyond my capacity. I would not like to make recommendations to you, but it might be worthwhile following up with WaterNSW.

The CHAIR: Ms Paul, in your submission in relation to Gin Gin Weir—the Macquarie re-regulating weir—you mention that the Government promised a fish ladder for the weir in 2011 but that has not yet been installed. Please explain to the Committee the importance of the fish ladder, and why it is one of your key recommendations to install this as opposed to expanding that weir.

Ms PAUL: Without a fish ladder, the fish need to move upstream to breed. They are stopped at the Gin Gin Weir because they cannot swim further upstream. This really puts into jeopardy the fish breeding event. So the number of fish that are bred and produced becomes less and less, and it is more difficult—the only recruitment will come from some of the deep pools that harbour the Murray cod. Moving upstream into other waters is a very important part of the fish breeding cycle. Following the temperature, I think, is how it happens, because the temperature needs to be a certain degree for fish breeding to occur. So it really lessens all these breeding events. The yellowbelly, the Murray cod and the silver perches are critically endangered because they cannot breed as they are meant to. In some of the upstream creeks, fish ladders have been installed. But it is a very serious omission that there has not been one installed at the Gin Gin Weir for close to 10 years, when it should have been installed. It is having a very detrimental effect primarily on our native fish in the river.

The CHAIR: Your submission mentions the importance of the lower Lachlan wetlands and flood plains for two of Australia's rarest woodland bird species—which you also mentioned in your opening statement—the regent honeyeater and the swift parrot. Could you please explain to the Committee a little further why these wetlands are so important for those two species, and what the risk is to those species if the wetlands dry up as a result of the wall—or what risk raising the dam wall poses to those two bird species?

Ms DARK: Those two species, the swift parrot and the regent honeyeater, are actually woodland species, not wetland species. Sorry if I made that sound a bit confusing. Different birds have different habitat requirements, and those are woodland species. It is well known in birding circles that woodland species are declining nationally because of habitat loss and the fragmentation and degradation of what habitat is remaining. So everything that is remaining is pretty critical, especially for those two birds that are classified as critically endangered federally under the Environment Protection and Biodiversity Conservation Act, which means that they are also classified as such under State legislation.

I think that I might have mentioned that there are only 400 individual regent honeyeaters remaining in the wild. The impact of the raising of the dam wall will destroy 1,319 hectares of box gum woodland, and that is the entire amount of that woodland within the footprint of the increased dam wall area. That might not seem like a huge amount of land nationally, but it can be critical when we get down to 400 animals of a species remaining. Those birds used to be present, from memory, in large flocks. They were healthy, they were strong and they could hold their own in competition with other bird species. They now find it really hard to do that because there are so few of them. They are specialist rather than generalist in what they like to eat. They can only use what is left in the landscape that is suitable for them, so when conditions are bad in one area they will move on to another area where the conditions are better.

When the eucalypt species in the Wyangala area are having a good season, and they are in flower, that is when the regent honeyeaters would go there. They are nectar feeders, so they go to eucalypts that are in flower. The other food source they use is mistletoe flowers. Mistletoe is a parasite that grows on a variety of species of trees, but those trees need to be mature to get mistletoe on them. I do not know if you know, so I will explain a little bit about mistletoe. There is a tiny bird called a mistletoebird that feeds on mistletoe and spreads the berries onto the branches of eucalypts and other trees. So that is how mistletoe is spread. That only happens on large trees. For instance, it does not happen in new revegetation areas—you just do not find mistletoe there. That is another reason why their food sources are precious.

The other thing that relates to their use of the landscape—and this is not confined to them, other bird species do this as well—is that they need hollows in large trees to breed. Eucalypts are slow growing as a whole. To get a hollow you have to have a tree limb drop off. Then a hollow gradually forms in the trunk or the part of the limb that is still there. That takes decades to happen. People say a minimum of 100 years. For a tree to provide a nesting hollow for a regent honeyeater or other hollow-nesting birds, it has to be 100 to 200 years old. We are talking long time frames here. Every time, for instance, a tree is lost in a paddock, that potential nesting hollow is gone and irreplaceable. Does that answer the question adequately?

The CHAIR: Yes, that is great.

The Hon. BEN FRANKLIN: I appreciate that you are focusing on some very specific, often environmental impacts. I appreciate the evidence that you have given today and, of course, the submissions that you have made. I would just like to pull out and discuss on a slightly more macro level a bit about your views on some of the broader issues of this Committee and inquiry. I will mainly focus questions towards Lachlandcare but, if anybody would like to jump in, please do. I have only got a few. We will start with Mr Doyle or Mr Hyde and then broaden if necessary. How did your local community or communities go in terms of the drought? What was the impact in your community?

Mr DOYLE: That is one of the points that I actually made in my submission. No towns in the Lachlan were listed under schedule 2, requiring critical human needs to be addressed—referring to the Water Supply

(Critical Needs) Act. No towns in the Lachlan entered level 4 drought measures during the summer of 2019-2020. Whilst our communities were seriously affected—the people involved with dryland farming and irrigation allocations were cut back—the town water supplies were not impacted. The fact that the project has been listed in the critical needs Act under schedule 3 is actually unnecessary because the towns did not reach those water levels. There was still water in the dam.

The Hon. BEN FRANKLIN: You just mentioned "critical needs". Do you think that that definition should include water for jobs? I am not talking about irrigation here. I am talking about abattoirs or cement plants and things like that.

Mr DOYLE: Look, it probably should but I would have to read the definitions in the Act.

The Hon. BEN FRANKLIN: It was more your opinion.

Mr DOYLE: My opinion would be that, if the towns can continue to function, then that water would be critical to those towns.

The Hon. BEN FRANKLIN: What would the impact have been in your region if there was not the sort of infrastructure we are talking about, like dams, weirs, pipelines and so forth?

Mr DOYLE: Well, the dam is already there. So if the dam was not there at all, there would not be any water. But there was enough water in the dam to sustain those communities through that very dry period.

Mr HYDE: If I could come in—because I live very close to Cowra. You would have to ask the Mayor of Cowra whether Cowra suffered either economically or environmentally during that drought period.

The Hon. BEN FRANKLIN: We will be getting Cowra Council in, I suspect.

Mr HYDE: As a local, I did not notice any change in water use in Cowra. The football field and the cricket pitch remained very green during the entire drought period, whereas the surrounding countryside was really quite bare. I think the drought had—this is a personal opinion—more impact on the irrigators, particularly as their general water allocations were cut back significantly, and on the surrounding grain growing and pastoral community. During the drought our pastoral community managed very well and in a very technologically advanced way. They managed the drought by destocking, by supplementary feeding and by transporting animals in and out, so regional infrastructure, transport networks and communications have been particularly important during the last drought period and are likely to be even more important in future drought periods.

The Hon. BEN FRANKLIN: I would like to ask one question to each of you that is part of the crux of this inquiry. What are your views on what the Government should do to improve water supplies, noting that we have obviously already got extreme weather events in Australia and that is likely to increase with the impacts of climate change? What do we need to do to ensure that we have appropriate levels of water security?

Mr HYDE: We have given this a lot of thought. One issue that we believe that is absolutely critical for government to deal with is the health of the catchment. We know on our individual farms that have healthy catchments that we do not have those peak water flows into the dams. We have clean water flowing into our dams. We do not have all the debris. There have been many reports on the health of the Lachlan catchment. I refer you particularly to this document from the old catchment management authorities. This is the support chapter for the Lachlan tablelands. That identifies the longstanding problems with erosion and peak water flows in the upper Lachlan catchment, which all contribute to debris and siltation within the dam and downstream.

We believe that any work on the dam—really any work on the catchment—needs to include a refocus on the health of the catchment. That is why we have, since we have been able to read the water strategy for the Lachlan—we did not get that before submissions were due for this inquiry. But we have really focused in our submission today to really ask you to look significantly at the health of the catchment and doing something on the health of the catchment to increase water flows into the dam and for those downstream users. This may or may not mean an enlargement of the current dam. But, even with the current dam, the health of the catchment may—it has potential to yield more water.

The Hon. BEN FRANKLIN: Mr Doyle, did you want to add anything?

Mr DOYLE: I think Keith said everything that we have to say. I think the impact of improved environmental management up in the catchment—and I live right up the top of the Boorowa River, where our Landcare efforts are trying to encourage landholders to improve ground cover on the land to reduce evaporation. There has been a lot of work fencing off creeks and rivers to limit stock access and limit the amount of sediment coming out of the rivers in the upper reaches. I think all that work needs to continue. That contributes further down to the health of the river.

Dr FITZSIMONS: There are many ways to think about this. The Great Cumbung Swamp, which we own, could be viewed as a small part of the big challenges of the Murray-Darling Basin in terms of an end system, which is the Cumbung basically being potentially impacted by upstream activities. Look, there are plenty of ways. Obviously the Murray-Darling Basin Authority and the Federal Government have been thinking about water efficiency for a long time here. Water efficiency on farms is a way we can think about, rather than just dams, how we might save water in the system. There is no doubt about it: Many millions of dollars have been spent on this right now so I guess our issue is that we have not seen the cost-benefit analysis. All we are seeing is the proposal to raise the dam wall for a whole range of reasons but the comparison with other alternatives we are not being presented with.

The Hon. BEN FRANKLIN: I think the business case is being finalised now, so hopefully we will all see that soon.

Dr FITZSIMONS: Yes, indeed—so that we can make some important decisions and have a big robust discussion around that. But until that happens and until we sort of see the hydrological modelling of flows, there are many questions that remain as to what the real benefits are.

The Hon. BEN FRANKLIN: Thank you, Dr Fitzsimons.

The CHAIR: Ms Dark, I think you are wishing to comment?

Ms DARK: I would like to comment too, if I could.

The Hon. BEN FRANKLIN: Please. Absolutely.

Ms DARK: Yes. I mean, I live in Sydney. I am not west of the Divide but I have links there. I go there on trips. We go birdwatching. I mentioned the Cowra Woodland Birds project where surveys have been done for 20 years, actually, coming up. I travel to that area regularly. I have seen the drought out there. I think raising a dam wall should be a last resort after other strategies have been put in place. I think we need to use money wisely. Raising a dam wall, quite apart from all these other issues that we have spoken about, it seems rather an old-fashioned solution.

I think we need to be cleverer in looking at how to manage water security in a drying climate. I am sure that others with expertise in infrastructure technologies will be making valuable suggestions. I did read The Nature Conservancy's submission and I know that it has listed four alternatives to raising the dam wall. I find that upgrading outdated irrigation infrastructure, improving how the current water allocations are used, to me, sound pretty compelling. I note the comments in The Nature Conservancy's submission:

> Efficiency would only need to be increased by 13% of the sustainable diversion limit to cancel out any benefits from raising the dam wall.

It seems to me that dam wall raising and putting in more barriers to water flows should be a last resort rather than the initial idea that we go with.

The Hon. BEN FRANKLIN: Thank you very much, Ms Dark.

The CHAIR: Thank you so much. We are now moving to questions from the Opposition.

The Hon. PENNY SHARPE: Dr Fitzsimons, I want to ask about the Great Cumbung and where you are at in the process or if you are down the track of actually getting Ramsar listing.

Dr FITZSIMONS: Thank you, Ms Sharpe. We have done a very preliminary analysis and we are looking at how that process might work. We are going through just an informal process of talking to consultants without going through that process of the study. It is certainly based on the nine-or-so criteria. We think it meets about five of those that will qualify at this stage. Acknowledging the Great Cumbung is at the end of the Lachlan, but just next door indeed, the Lachlan used to flow into the Murrumbidgee in big flow events. One of our other big interests here, of course, is the property just across the other side of the Lachlan, which is the Gayini-Nimmie-Caira, on which the New South Wales Government and the Australian Government have spent $180 million on buying back both the land and water rights there for large-scale restoration.

I guess the other big challenge and I guess the big opportunity we see is that we want to see flows restored to both the Lachlan, to the Cumbung, which also ultimately benefit this huge investment that New South Wales and Australian governments have put into Gayini-Nimmie-Caira next door as well. Collectively, that wetland system in the Caira, Cumbung and Yanga is about 180,000 hectares. This will be a premier site for a potential future Ramsar listing in New South Wales.

The Hon. PENNY SHARPE: Thank you for that. I wanted to ask you how the endangered ecological community is dealt with. I understand that it is done through the Environment Protection and Biodiversity

Conservation Act, but I am wondering whether you can comment on the New South Wales wetlands policy. I have asked all of the different people who have given evidence to this Committee and no-one seems to be able to answer the question, so no pressure. But really I just wanted to understand this: The New South Wales Wetlands Policy has various requirements we have signed up internationally around migratory birds. Whether it is Ramsar listed or not, we are basically required to follow. I am trying to work out whether you are aware what the process is for the New South Wales environment Minister going through this process with some oversight or some concurrence around the impact on the wetland through the planning process.

Dr FITZSIMONS: I will not comment specifically on the New South Wales environmental policy regarding wetlands, but I will though under the endangered ecological communities, especially under the Fisheries Management Act.

The Hon. PENNY SHARPE: Yes.

Dr FITZSIMONS: So it is a different system to what the usual ecological community listing is in New South Wales, but that also highlights how both important that system is but also how under pressure. If you look at the key reason for listing in the first place, it was around new infrastructure in the river and Wyangala Dam was listed there. In terms of broader policies around wetlands to get Ramsar listing, obviously you need both agreement of the State and also the Federal Government to have that nomination in the first place. We would certainly be seeking that. Again I guess with the investment that the New South Wales Government has already put in with the Australian Government to buy the property next door, Gayini-Nimmie-Caira and indeed Yanga way back 10, 12 or 20 years ago, highlights the value that the State and Federal Government have placed on the system in the past. It is a significant investment they have put in there. To me, those water flows are going to be critical to make sure that that investment was well spent.

The Hon. PENNY SHARPE: Great. Are you saying to us that you think there is a danger that the impact on Nimmie-Caira and the others would be significantly impacted around the tributary flows if they dry up? That is obvious, but I suppose with the raising of the Wyangala Dam, is it of heightened risk? That is what I am asking.

Dr FITZSIMONS: Certainly for the Great Cumbung itself where it is the terminal system of the Lachlan. Again, the Lachlan would have flowed into the Murrumbidgee in previous times. That is an important ecological connection between two important rivers in the system. A raising of the dam wall at Wyangala will make the likelihood of that event occurring much less, let us be honest.

The Hon. PENNY SHARPE: Yes.

Dr FITZSIMONS: It is going to prevent those flood events and will prevent that connection between the two rivers.

The Hon. PENNY SHARPE: Great. Thank you. I have a question for Ms Paul. Thank you for your submission. I was very concerned about the point that you raise which has not really seemed to be picked up anywhere else and which is the impact on the Gin Gin weir and the possible impact on the Terramungamine Rock Grooves. Could you outline to the Committee your concerns about this?

Ms PAUL: If you see a photograph of the rock grooves you can see that they have been used over a long period of time for sharpening of Aboriginal tools. They are a registered site and they are cared for by the Wongaibon—it is pronounced not quite exactly like that—clan, who care for it according to how you should care for things that are of special significance to you. They believe and I believe that there are also other such grooves down along the river and when you go down as far as the Macquarie Marshes, there are special places there that the clan from down there also look after those sites according to the way they are to be cared for, as anybody does with things that are very special. So it brings to mind what happened with Rio Tinto very particularly. They are particularly valuable to—I am trying to think of the word.

The Hon. PENNY SHARPE: It is very important for the First Nation people there and they are sacred sites, essentially.

Ms PAUL: Yes. It is a very, very special site. It is an amazing sight. There are a whole lot of photographs available on the site links.

The Hon. PENNY SHARPE: I have seen photos of them. They are quite amazing, but they are also featured very heavily in relation to tourism. People are encouraged to go and visit them.

Ms PAUL: Yes. And so many of these things that are special are involving tourism. All along the river there are other special sites that people know they are there, they do not have to advertise them, but people come specially to wonder and realise how important all previous history is to Australia, to us and to these sites and to

these rivers. They are not just there for exploitation, for a small number of people to benefit from. The health of the river is extremely important because without that water will not be provided in any shape or form that can be useable because of things like blue-green algae, as we have seen other drastic things over on the Darling River with fish kills. There have been similar fish kills in the lower weir on the Macquarie River. They have suffered in a similar manner.

All of these specific sites and areas along the river must be preserved, cared for. But just by damming something up and hope there might be enough water to fill them up, that destroys a lot of the value of a river because they will drown the vegetation on the river, they will do the same thing to vegetation that keeps the banks stable. And another thing that can happen also is that areas that have never been flooded can break out behind that weir, so that all the floodwater that should be going down to benefit the rest of the length of the river, will go out above where the dam is and flood areas that nobody wants to be flooded.

The Hon. PENNY SHARPE: Thank you, Ms Paul—

Ms PAUL: The same thing can happen to the rehydration of the floodplain as well. Without those effects that provide water back into the river, if they are going to be taken away for—

The CHAIR: Thank you, Ms Paul. We will move to another question from the Hon. Penny Sharpe.

The Hon. PENNY SHARPE: No, thank you for that. I have a question for Mr Doyle or perhaps Mr Hyde. We have had evidence that the New South Wales Government and Federal Government have been through a variety of different planning processes in recent times around water allocation in the Lachlan, there are the regional water plans, the plan that had to be submitted for the Murray-Darling Basin Authority, and there are the water sharing plans. Are you able to comment on whether you have been consulted in that process, and how heavily the raising of the Wyangala Dam project featured in any of those consultations?

Mr DOYLE: We have not been consulted directly with WaterNSW. I have actually had some discussions—one of our board members is on the board of the Lachlan water sharing plan committee and he reports to us on their activities. We also had discussions with Hugh McLean from Booligal Wetlands, who has similar concerns to Dr Fitzsimons.

The Hon. PENNY SHARPE: Yes. We heard from him last week.

Mr DOYLE: Yes, okay. Whilst we are not directly involved with the water sharing plan, we do know what is going on with the water sharing plan through a shared board member and through my discussions with Hugh in relation to our proposals for this Committee.

The Hon. PENNY SHARPE: Mr Hyde?

Mr HYDE: Ms Sharpe, if I could just follow up on that. Our land care group basically encompasses most of the perimeter of the Wyangala Dam and our counterpart, Upper Lachlan Landcare, almost takes in the rest of it. We have not been consulted on either by the water sharing plans. That is a bit outside our territory, it is more for the irrigation and townspeople and other users and environmental aspects downstream. But we have not had any direct consultation from WaterNSW until the last round of community information sessions.

Following on those community information sessions we have been talking with people within WaterNSW and their GHD consultants on the environmental issues from around the dam, and we have been working with the Cowra Woodland bird group for the last 20 years. We have also been working with the former New South Wales Office of Environment and Heritage, I think it is now a part of the Department of Planning, Industry and Environment, which have done a lot of environmental work in our work.

And also I reference you to the conservation and landscape ecology group at the Australian National University who are doing a lot of herpetofauna, reptiles and frog work in our area. These are some pretty rare and endangered species that have trouble getting out of the way of floodwaters. While the frogs can swim, a lot of the lizards have difficulty. So they have been doing a lot of rare and endangered species work in this area for the last, at least the last five years they have been working with us. Most of our properties come within that 10 kilometre environmental impact footprint of this current dam.

The CHAIR: We are at the end of this session. I thank you all very much again for participating in this inquiry, for your submissions and making the time to appear today.

(The witnesses withdrew.)

(Short adjournment)

ROBYN ALDERS, Chair, Upper Lachlan Branch of the NSW Farmers Association, before the Committee via videoconference, affirmed and examined

IAN WEBSTER, Member, Upper Lachlan Branch of the NSW Farmers Association, before the Committee via videoconference, sworn and examined

THOMAS GREEN, Chair, Lachlan Valley Water Inc., before the Committee via videoconference, affirmed and examined

MARY EWING, Executive Officer, Lachlan Valley Water Inc., before the Committee via videoconference, affirmed and examined

The CHAIR: Welcome everybody to the next session of the hearing today. All of the witnesses in this session are joining via videoconference. I want to check, we have Dr Alders and you can hear us okay?

Dr ALDERS: Yes. I can hear you just fine, thank you.

The CHAIR: In case there are any difficulties, we will check with everybody. Mr Ian Webster, you can hear us okay?

Mr WEBSTER: Yes, I can hear you.

The CHAIR: Mr Tom Green?

Mr GREEN: Yes, I can hear you.

The CHAIR: And Ms Mary Ewing?

Ms EWING: Yes, I can hear you.

The CHAIR: Thank you very much. I assume some of you have prepared short opening statements.

Dr ALDERS: Yes, we have a short statement that I will make.

The CHAIR: Please proceed.

Dr ALDERS: Good morning and thank you so much for inviting our branch to participate in this important hearing. We would like to thank the New South Wales Government for their commitment to improving water security in the State, including for farmers and other water users. The proposed investment is significant especially considering that compared to the majority of other OECD countries, public sector investment in agriculture in Australia is extremely low. It is this background of low public sector support and increasing challenges to sustainable family farming that underpins our submission to this inquiry.

Given the scarcity of public sector support for agriculture, we would like to increase probability that the projected funding, that is $650 million in the case of the proposed increase for the height of the Wyangala Dam wall, we would like to see that this investment yield a greater return on taxpayer funds committed. Our submission outlines three key concerns. We worry that the proposal to raise the Wyangala Dam wall, firstly, will not yield significant increases in the available water downstream. Secondly, it does not address problems with siltation of the current dam, which has reduced and continues to reduce its useful life, and thirdly, appears to have been made without access to robust hydrological data, benefit cost analysis, environmental studies and engagement with local communities.

Our recommendations regarding these three concerns are, firstly, if the State Government really wants to increase the stored water capacity along the Lachlan River, there are other tributaries downstream such as the Boorowa and Belubula River that may capture more water if dammed. Additionally, subject to support from hydrological flow data, there may be an opportunity to increase Upper Lachlan capacity by construction of a smaller dam upstream on the Abercrombie River in steeper topography that would inundate much less prime agricultural land and existing perimeter infrastructure.

This solution would greatly reduce the negative impacts of potential water level rise from raising the Wyangala Dam wall itself. Secondly, enable landowners in the Wyangala Dam catchment area to improve their land management practices for a cost efficient investment that improves soil and landscape health, that would reduce the loss of precious topsoil and improve the quality of water entering the dam. Likewise, enabling downstream water users to improve water use efficiency, will help futureproof their operations. Thirdly, engage with us—the local communities including farmers—who have intimate knowledge of the area where we live and work. In conclusion, we ask that the Government adopt inclusive participatory methodologies when conducting assessments and involve locals to co-design proposals that will contribute to the sustainable land management,

sound biosecurity, improved human and animal welfare, improved agrodiversity and biodiversity and support enduring production of high-quality food and fibre—something our Shire is very proud of. Thank you.

The CHAIR: I assume that statement was on behalf of the Upper Lachlan Branch of the NSW Farmers Association and so, Mr Webster, you do not have an additional statement. Is the same true for Lachlan Valley Water? Who is making the statement?

Ms EWING: I am speaking on behalf of both of us at Lachlan Valley Water.

The CHAIR: Thank you.

Ms EWING: Thank you for the opportunity to speak to the Committee today. Lachlan Valley Water is an industry organisation representing both groundwater and surface water users in the Belubula and Lachlan catchments. Membership of our organisation is voluntary. We have represented more than 500 water users in this catchment and what we have heard from our members is that the majority of them do support the project to raise the Wyangala Dam wall and increase security and reliability. We will need to get on the front foot and prepare for a change in climate and the increased variability that we have seen, particularly over the last 20 years.

In 2014 the State Infrastructure Strategy rated the Lachlan low for both drought security and flood management. There have been several investigations since then into projects to improve security and reliability and raising the wall of Wyangala Dam was identified as a project that offers a step change. One of the issues of the Lachlan is a very high essential flow requirement. It takes 180,000 gigalitres a year to run the river and meet basic needs and another 53,000 for high priority needs. So under the highly variable conditions we have had in recent years, we could change very quickly from flood to drought and this makes it tough for everyone, particularly those who need constant supply, including the towns, stock and domestic intensive producers and industries.

A common question that has been raised by our members is that, yes, everyone wants to see the hydrological modelling to understand what the 21,000 megalitres a year average increase in reliability means. It might be nothing in 2017-18 but 60,000 megalitres in 2019-20, which would have made a huge difference to the region in that year given that droughts set in very quickly and very savagely. We fully agree that the business case must be available and it must incorporate the impact that raising the dam wall would have on flood impact as well. We expect this would be significant given that the Wyangala only has 4 per cent airspace currently.

Community consultation has clearly been limited by the COVID-19 restrictions but Lachlan Valley Water did have WaterNSW as our keynote speakers at our recent annual general meeting because there was a high level of interest in the project. Generally the feedback we had was that it was good to hear from WaterNSW directly so we agree that it is essential that community engagement happens as soon and as informatively as possible. The NSW Planning Portal makes it clear that very detailed environmental investigations are required and that the actual construction on the project cannot start until all the environmental and other approvals have been finalised. From our point of view, it is important that the Government continues not only with this work but with all of the necessary investigations to enable the project to progress. Thank you.

The CHAIR: Thank you very much for both of your opening statements. We will now proceed to questions. I have a couple of questions to begin with. This is for either organisation, what consultations have you had with WaterNSW in relation to options in addition to the raising of the Wyangala Dam wall? One of the things this Committee has been tasked with is to look at what alternatives there are there. Can I start with the NSW Farmers Association? Have you been involved in discussions around alternative options or heard of any in the area?

Dr ALDERS: We have not been directly involved in discussions around those options. We also had a speaker, a consultant working for WaterNSW, at our recent AGM. They were certainly keen to hear about suggestions that we had but there has been no further follow-up on that and that was our first engagement. I have to say the first time I heard about the proposal to raise the dam wall was when the local newspaper contacted me. Moving forward, we are here and we would love to talk about these options that we presented today—while they were mentioned in passing during our AGM—have not been formally discussed. Would you like to add to that, Mr Webster?

The CHAIR: I think Mr Webster is on mute.

Mr WEBSTER: How is that?

The CHAIR: That is better.

Mr WEBSTER: Yes, I would agree with Dr Alders' comments there and add that from an engineering perspective—I should advise that I am also a qualified engineer as well as a grazier—the differences to the project in terms of a range of different wall heights are really significant. The level of inundation and the amount of

obviously potential carrying capacity is huge, and the constructional cost in every respect, including the surrounding areas and all the other related facilities and infrastructure, is enormous. To consider a range of wall heights, there are all sorts of detailed implications.

The CHAIR: We might explore that a little bit later. I will go to Lachlan Valley Water, if it has any response to my question.

Mr GREEN: In relation to WaterNSW, since 2014 when investigations started in phase one—initially looking at the Belubula catchment for a dam—we participated in consultation around that. That progressed in 2016 to phase two. There was a customer reference group and a community reference group set up, and it further investigated potential dam sites. From memory there were four flagged in that phase two study—two within the Lachlan catchment and two within the Belubula catchment. From that, the preliminary business case and the modelling at that stage indicated the best option was raising Wyangala. Yes, there has been consultation through that and also through the WaterNSW customer advisory group for the Lachlan.

The CHAIR: When you mentioned the options paper identifying Wyangala as the preferred option, which options paper was that?

Mr GREEN: I would have to take that on notice. It was in phase two of the water security investigation project at 2016-17.

Ms EWING: Also, I think that led to WaterNSW publishing its *20 Year Infrastructure Options Study: Rural Valleys* in 2018, which also identified by then the Wyangala Dam project as one that would deliver outcomes.

The CHAIR: Just to probe that a bit more, it did say—I am aware that that was put up, I think, in the 2018 infrastructure strategy as one of the options. But I am curious as to the reasoning or information behind the Wyangala Dam wall raising project being identified as the best option and what underpinned that, considering so many witnesses have talked about not being able to see the business case, cost-benefit analysis, hydrological modelling and so forth. Mr Green, have you been a part of some discussions or meetings where potentially confidential documents have been discussed with certain stakeholders to come to—which is fine, because that is what happens. Is that what you have seen?

Mr GREEN: No. I am referring to the water security investigation project—it was phase two—and information that was provided to the community reference group during that period, which fed into a preliminary business case.

The CHAIR: Can you recall then what the reasons were behind the Wyangala Dam wall raising being the preferred option?

Mr GREEN: From memory, my understanding was the hydrological modelling, larger catchment, cost, issues regarding Cranky Rock and limestone areas and also that Wyangala was already flagged for a significant safety upgrade of over $200 million.

The CHAIR: I believe we did hear from witnesses at Thursday's hearing suggesting that no hydrological modelling has been undertaken. Mr Green or Ms Ewing, have either of you seen that hydrological modelling for the Wyangala Dam wall raising?

Mr GREEN: No, I have not seen that—only what was provided during the community reference group. There were no papers detailing the hydrological modelling.

The CHAIR: I just ask the other witnesses whether they have heard of or seen any hydrological modelling. Dr Alders or Mr Webster, from NSW Farmers Association?

Dr ALDERS: No, I have not seen such data.

Mr WEBSTER: No, neither have I. I would add that that is a common theme throughout the local community and our particular branch in the catchment.

The CHAIR: Thank you. I was wondering—because this is important for what has occurred so far in relation to the Wyangala Dam wall raising proposal—whether it was possible to table on notice, Mr Green, some of the documentation you are referring to in relation to those options?

Mr GREEN: Yes, I have got customer and community reference group meeting slides from that project that I am happy to table.

The CHAIR: Thank you. That would be very useful. Mr Green, you have also said that you may have seen a preliminary business case. Is that correct?

Mr GREEN: This document that I have is an overview of the preliminaries. It is dated October 2017. I have not seen a full preliminary business case. This is simply what was relayed back to the reference groups.

The CHAIR: Does it have a costing on there of $650 million?

Mr GREEN: Let me just check. I do not think that it has the exact costings raised on it. Ms Ewing?

Ms EWING: If I could add, I think by the time the *20 Year Infrastructure Options Study: Rural Valleys* came out in 2018 that is when the $650 million figure was stated.

The CHAIR: Thank you.

Ms EWING: But we do not have any detailed work behind that.

The CHAIR: This question is for both organisations to answer, if you would like to. In relation to mines in the area, we have heard from some witnesses and in a number of submissions that some of the increase in storage that Wyangala Dam wall raising will give is for the increased need for certain gold mines in the area and potentially other mines. I will start with NSW Farmers Association: Have you heard anything to that effect or do you wish to comment on that?

Dr ALDERS: We have heard anecdotal suggestions that this is the case. We have seen nothing in writing and nothing has been formally communicated. Mr Webster, you have been around the traps. What have you heard?

Mr WEBSTER: I have nothing to add to that comment, Dr Alders. It has been anecdotally only; I have nothing concrete to add to that.

Ms EWING: Yes, I will take this question. Mines have licences to use water. Looking at the information that is publicly available, Cowal Gold Mine used about 3,500 megalitres of surface water last year. North Parkes has licences for 4,760 megalitres of surface water. They are the two major operating mines that take water from the Lachlan at this stage. Their usage is relatively low compared to the overall usage. Usage over the past 20 years has averaged about 180,000 megalitres a year—obviously being very affected by the millennium drought—so that the mines' actual usage of water is a low percentage of that. Our position also is that any industry looking to acquire water should buy a licence. There should not be any new licences issued as a result of this project.

The Hon. BEN FRANKLIN: Ms Ewing, it also sounds as though it is pretty low compared to the economic positivity and the contribution that those mines make to our State and nation.

Ms EWING: Yes. They also aim to reuse as much water as possible. But, yes, they are significant contributors to our local economies here. Certainly in Forbes, Parkes, West Wyalong, it is a significant benefit to the community to have those mines—well, to have people working in jobs like that and to have them operating in the area.

The Hon. BEN FRANKLIN: Absolutely. I will start with Lachlan Valley Water Inc., if I may. Thank you for your excellent submission. I will go to a couple of points in it. The first was your comments regarding flood management and particularly talking about what had happened in 2016-17 and what happened once the inflows came in—for obvious reasons—when the Newell Highway was closed for 42 days and so on. Could you speak to what the broader impacts of that flooding were?

Ms EWING: Certainly in the Cowra to Condobolin region, there was significant flooding and loss of crops. I do not have a figure on the costs.

The Hon. BEN FRANKLIN: If you have any further information, you are welcome to take it on notice. My point is that one of the major positive reasons for raising the dam wall at Wyangala would be flood mitigation. I am looking for what the impacts of flooding have been on your community. If you would like to take that on notice, you are welcome to do so.

Ms EWING: We will take it on notice.

Mr GREEN: I could just add that as a local farmer, the flooding of the system was devastating. A number of farmers lost 80 per cent to 100 per cent of their crops. Obviously, the highway was shut for around 42 days and I know there is anecdotal evidence from local businesses that were heavily impacted by that on passing traffic.

The Hon. BEN FRANKLIN: I will throw quickly to the NSW Farmers Association. What was the impact of those floods on the farms that you are associated with or that you know of?

Dr ALDERS: To give you a dollar figure, we would need to take that on notice. Certainly, flooding and the increasing frequency of severe storms has impacts on infrastructure, such as fencing and dams. But to give you a number, we would need to take that on notice.

The Hon. BEN FRANKLIN: That would be wonderful. Going back to Lachlan Valley Water Inc., I noticed in your submission that you are quite firm in saying that you want to ensure that all appropriate processes, particularly environmental processes, are followed before such a process was enacted—i.e. raising the wall. You talked about complementary measures to improve environmental outcomes. You mentioned a couple of those. Would you like to speak further to that? That is obviously at the heart of what some of those opposing this project are talking about, which is the impact on the environment. I am interested to hear the view from the other side.

Ms EWING: Certainly, we understand from the planning portal that there is no way the project can proceed until all the environmental impact assessment is completed.

The Hon. BEN FRANKLIN: We took evidence of that on Friday from the Government, which said that every single process was going to be progressed as normal. So there were not going to be any corners cut in that way.

Ms EWING: In terms of other water infrastructure technologies to promote environmental outcomes, which was one of your questions, we agree that there are other options that can help improve environmental outcomes anyway through the valley. That might be installation of pumps at different environmental sites down the river to help improve delivery of water to flood plains, lakes etcetera, to make more use of water that is available; and also things like fish passage, fish screens etcetera. There are other, lower-cost options that will help improve overall environmental outcomes. We think they should be considered alongside all the other management options.

The Hon. BEN FRANKLIN: On Friday WaterNSW, as part of its evidence, spoke to a community sentiment report which showed quite substantial and, in fact, overwhelming local support—I think 84 per cent was the number—for the benefits that would accrue to the local community from raising the dam wall at Wyangala. Do you have any comments on that? Is that in line with the sort of community sentiment feedback that you have been experiencing?

Mr GREEN: Certainly, on the ground level, the conversations that I am having with people just in town or with members is an excitement that there is potentially a large investment coming to the valley. I guess they want to see the project proceed. Certainly around the Forbes area, I have not come across too many that are against the project. Following that, I suppose a lot of people—the feedback I receive is their biggest fear is that minority interests will derail the project, so they are quite keen to see the process continue and the Government push ahead and get the processes done so the construction can start.

The Hon. BEN FRANKLIN: What do you mean by minority interests?

Mr GREEN: That is more that without information, people can make assertions of issues within the valley, whether it be on flooding or lowering of flows. Until we see that information, that is only hearsay. But people are concerned; I suppose they see it in walks of life where interests are able to slow or derail projects because they are diametrically opposed regardless of whether the business case stacks up.

The Hon. BEN FRANKLIN: I would be interested in the comments of both groups on a final issue that I have raised with some of the previous witnesses: The Commonwealth and the New South Wales water Acts both prioritise water for critical human needs. Can you speak to what you think critical human needs are, and if you think that should include water for jobs? I am not specifically talking about irrigation; I am talking about jobs like cement factories, abattoirs and mines—things like that. Should that be considered part of critical human needs?

Mr GREEN: I guess from Lachlan Valley Water's point of view, that is a decision for government under the Water Management Act. In terms of whether that should be, yes, at particular times there should. But there should not be winners picking winners. The market, while able to operate, should operate. If you hit the point where the market can no longer operate, then that is a decision for government to provide that under the critical human needs. But we do not think that you should pick winners—some businesses, just because they are on a town line, should get preferential treatment over someone who has done their own. But we do not think that you should pick winners and that some businesses just because they are on a town line should get preferential treatment over someone who has done their own.

The Hon. BEN FRANKLIN: But as a general statement you would support the idea that employment and preserving employment would be considered a critical human need.

Mr GREEN: I would accept that statement.

The Hon. BEN FRANKLIN: Dr Alders, would you like to make any comments about that?

Dr ALDERS: If I could, I would just return to your earlier statement regarding the survey that was done within the community. We have not seen the calculations or the power calculations around how the 800 people

who responded to that survey were selected. I think from our area the percentages would have looked quite different. You have spoken to a number of people involved with Landcare groups and certainly within our membership there are serious concerns, and so I think if there had been representative samples from our area, the percentage in favour of the project would have come down. Without having seen how the survey was designed and implemented we cannot comment but certainly in terms of probability that figure certainly could occur.

In terms of critical human needs this is where I think our country really needs to work together very closely. It is not just a State issue. Without water there is no life. Without water there is no agriculture; so understanding how decisions are made and what is decided as a critical use of water in a land mass that is quite dry. While I think we would all acknowledge "no water, no life" and "no water, no jobs" as a possibility, there are options. I think we need to take those options very seriously and to look at how water is best used, where it is found, and certainly market will play a role where irrigation is concerned but we cannot separate managing water and managing our land from an agricultural perspective—if you are doing terrestrial production. We have to look at both of those and so we would love to see a much more holistic approach to that.

Mr WEBSTER: I can add that from the community which is of course upstream of the dam in the catchment area the overwhelming sentiment is negative. That is simply a reflection of what one hears as one attends the meetings and speaks to those who have attended. The commentary in the press is very negative because people in our area cannot see the advantages of the proposed project. The second question, I would add: Absolutely. All of those uses of water are extremely important. They are vital human functions and should be catered for. The question is: Will the raising of this dam wall meet those needs? That is the question and I have a bit more to add to that if I have the opportunity later.

The Hon. PENNY SHARPE: Mr Webster, do you want to finish what you were saying?

The Hon. BEN FRANKLIN: I thought he did.

Mr WEBSTER: Yes, thank you. Just a brief word about the structure of the dam that we have. It is an absolutely massive dam. It ranks really highly in the size of dams in New South Wales. In its existing state it holds, at full capacity, two Sydney Harbours and the proposal to raise the wall by 10 metres increases that capacity by 53 per cent, effectively adding another Sydney Harbour. So it is a huge structure already and it has been a very effective structure. However, that increase—and this is simple engineering and simple mechanics and physics—will increase the perimeter of that dam enormously. The dam water will flow up valleys and river flats in all directions really significantly. That water will be relatively shallow because it is flat and hence will be warmer. That has environmental impacts and it also has impacts for the effect on the water area that is covered. So it will be a relatively shallow warmer additional capture.

The other significant effect is biosecurity. As that water flows up through the valleys and through the river flats—in those instances where the dam does fill—it will tend to kill off the cropping, the grasslands and very significantly thousands and thousands of red river gums up the Lachlan towards Reids Flat. These are enormous trees and they will certainly die if they are inundated for any length of time. The other aspect of biosecurity is that as this perimeter increases, the amount of agricultural land or private land and crown land that can be accessed by visitors, tourists, people and campers is enormous—they bring dogs—so there is a real biosecurity risk increase as a result of a very significant dam wall height raising.

There is a really key point here, too, and I am certainly not against dams per se, and I do not believe that our branch of the NSW Farmers Association is against dams per se, but this dam has only filled twice in the last 10 years. That was in 2011 and certainly we have heard about 2016 when it certainly filled and that filled dam was used for all sorts of purposes quite promptly after that. In the 10 years prior it never filled; it was the Millennium drought. So in 20 years the dam has been filled twice. In the 10 years prior to that only an additional handfuls of times. So one cannot help but wonder, against the backdrop of things like warming temperatures and perhaps climate change effects and a raft of other things, whether the massive construction and cost will achieve the desired result from the economic and production point of view.

The Hon. BEN FRANKLIN: It filled at least 15 times in the 20 years prior to that.

The CHAIR: Order! Time is precious. Ms Sharpe.

The Hon. BEN FRANKLIN: I am just making a point. Statistics are easy to present.

The Hon. PENNY SHARPE: Mr Green and Ms Ewing, we had evidence this morning that around 2009 there were estimates made regarding investment in on-farm efficiencies and that at a cost of around $170 million you could get 25 gigalitres per year in savings. What access have Lachlan Valley water users had to Federal funding to improve on-farm efficiency?

Ms EWING: That funding first came out as a result of the basin plan. The Lachlan only participated in, I think, rounds one and two of that Federal funding for farm efficiency programs and then they were stopped from participating after that because the Federal Government had already purchased enough water in the Lachlan. It purchased quite large volumes in 2009. My understanding is that Jemalong Irrigation put bids in to the Private Irrigation Infrastructure Operators Program but we were unsuccessful in getting funding.

The Hon. PENNY SHARPE: The Jemalong plan obviously has a lot of opportunities for people to really deal with the efficiency issues. Whether the dam wall went ahead or not, this would be an improvement, would it not?

Ms EWING: I will take that on notice. I think Jemalong Irrigation Limited should respond to that.

The Hon. PENNY SHARPE: Mr Green, you were on the community consultation group. Is that right?

Mr GREEN: Yes, in the phase two water security project investigation.

The Hon. PENNY SHARPE: Are you able to provide some information on the issues around the willingness to pay study? It is in your submission on page 4. What are you able to tell us about that?

Mr GREEN: Yes. From memory, in that we were provided with updates on that during the meeting. From memory, the willingness to pay survey was conducted by an independent third party and it ranked quite high that there was a strong willingness to pay in that.

The Hon. PENNY SHARPE: Is it your expectation that the raising of the dam wall will be funded through grants, and there will be no ongoing charges to water users as a result of the building of the wall beyond the current arrangements?

Mr GREEN: On top of the current arrangements?

The Hon. PENNY SHARPE: Yes.

Mr GREEN: Recently the Federal Government has announced half of it is agreed and the State Government initially flagged that this would be funded through the Snowy Hydro Legacy Fund. The expectation of irrigators is that potentially we will have new operational costs added to that to operate the new dam.

The Hon. PENNY SHARPE: Do you expect the payment for the new operational costs will be by the users? You have any sense of how much that is going to be?

Mr GREEN: The expectation is that that will go through the water pricing Independent Pricing and Regulatory Tribunal determination process in terms of the level that users pay. We are unsure of what that funding cost will be, or what level of contribution from us is expected to be.

The Hon. PENNY SHARPE: The willingness to pay did not provide any information on how much that might be?

Mr GREEN: No, it did not.

The Hon. MARK BUTTIGIEG: Lachlan Valley Water Inc. mentioned the fact that there is a bit of a dichotomy in the argument, where you have got environmental concerns superficially on one side and on the other the need for potable water, and the need for water for industry and jobs and whatnot. Given the evidence that we have heard to date, it does not seem to me to be that simple—particularly given the fact that we are not in possession of a detailed cost-benefit analysis. We have heard all sorts of evidence regarding how important it is for natural aquifers to be recharged and how important efficient use is, as well as how, on the surface, it looks like the cost of this will be somewhat disproportionate in terms of the return you get. I think that you mentioned in your evidence the implication that the flows are so low that you need more capacity. Is it fair enough to say that until we get that cost benefit analysis it is a bit premature to be rushing ahead with these sorts of projects?

Ms EWING: I am not sure that it is premature to be rushing ahead with the project, because a lot of work has to be done to decide the inundation level, which WaterNSW on their website said that they expected to be at that point by about now, which would then give some information which then allows other studies to be undertaken with a better understanding. But you are correct in that it is important that we get all this information so that we understand how the benefits will be distributed, and what the timing and extent of additional availability of water is, which will then enable a more accurate calculation of what the benefits are. We see a benefit in this work continuing to enable the project to proceed rather than simply having work done and making no progress. It has been six years since the first State Infrastructure Strategy came out and identified that the Lachlan had problems and no projects have been delivered.

The CHAIR: Thank you very much for making time to appear at the hearing today.

(The witnesses withdrew.)

DAVID SHERLEY, General Manager, Bathurst Regional Council, before the Committee via videoconference, sworn and examined

DARREN STURGISS, Director, Engineering Services, Bathurst Regional Council, before the Committee via videoconference, sworn and examined

GARRY STYLES, Manager, Water Security, Bathurst Regional Council, before the Committee via videoconference, sworn and examined

BRUCE LOGAN, Director, Water & Waste, Tamworth Regional Council, before the Committee via videoconference, affirmed and examined

The CHAIR: Welcome to our next witnesses for today's hearing. It is Cate Faehrmann. I am the Chair of Portfolio Committee No. 7. I will just check that you can hear me okay.

Mr DAVID SHERLEY: Yes, we can hear you quite well.

The CHAIR: Mr Logan, representing Tamworth Regional Council?

Mr BRUCE LOGAN: Yes, I am here.

The CHAIR: When you are not speaking I ask you to mute as the feedback is not great. Do any witnesses from Bathurst Regional Council have a short opening statement?

Mr STURGISS: In terms of our current situation that has now been resolved by way of having a dam at 100 per cent, but 12 months ago we were looking at having a water security issue of a day zero of approaching six months. Speaking as a water authority for a local community, that is a situation that we do not want to be approaching again. We are of the opinion that there is no better time than now to look to resolve water security matters in the Central West.

We are certainly working on a number of projects in Bathurst by way of the $22 million of funding we have gratefully received from the State Government. We are very keen to get that money expended so that we have additional water security. By way of example, we got to level four restrictions and were close to level five, which is where real economic losses start to occur. Level five would mean $160 million of economic loss to the local community per annum, with close to 800 jobs lost out of the best part of 10,000. Level 6 ends up being close to $650 million of economic loss to the community, and the best part of 4,000 jobs lost. As we progressed to system failure, that just gets worse. So we are very keen to resolve those matters as they [inaudible]. That is essentially our opening statement.

The CHAIR: Mr Logan, do you have a short opening statement as well?

Mr LOGAN: Tamworth, like Bathurst, has been in a severe water security crisis for the last 18 months to two years. Tamworth city has been on level 5 restrictions for almost 18 months. Level 5, so no outdoor water use and looking at limiting individual water use to 150 litres per person per day—thankfully it has rained, but our storage, Chaffey Dam, has not recovered as well as we might like. It is sitting in the low-thirties. We are still on level 3 restrictions here in Tamworth. Our view, obviously, is that there are two ways to improve water security. One is to change the way the existing water supply is available so more water is shared. The other way is to provide more raw water. The Government to date has been reluctant to agree to some of the suggestions made by council in relation to changing the way raw water is shared. On that basis the announcement of Dungowan Dam is a welcome announcement. The council supports the reconstruction of the Dungowan Dam and its associated pipeline.

The CHAIR: Can I just explore the issue of Dungowan Dam firstly? I understand that the council is currently the owner of the existing Dungowan Dam. What is your understanding of the new dam and who will ultimately be the owner of that dam, Mr Logan?

Mr LOGAN: You are correct. Dungowan Dam is 6,300 megalitres of storage capacity. It is owned and operated by Tamworth Regional Council. The ownership of the new dam has not been resolved as yet. We as council are assuming—well, we have petitioned government that we would like to own the new dam and certainly operate it. But we are probably assuming, given that it is a significant investment by the State, that they may own that dam. That obviously raises some issues with the ownership and operation of the old dam, but we are working through those issues with WaterNSW at the moment.

The CHAIR: If you could explain to the Committee a little bit about what those issues are. I would think that a parliamentary inquiry is in fact a very good forum to air those issues to make sure that we can get some of them resolved potentially. Could you elaborate on that?

Mr LOGAN: Obviously I do not think it is tenable to have—if the old dam remains in place, which has not been finalised, then you are going to have an old dam that is owned by Tamworth Regional Council in front of or upstream of a new dam that is owned potentially by the Government. That will create some issues in relation to the ongoing management of the old storage or whatever is outside of or to do with the old storage. Other issues—obviously we would hope that we can provide the service that the Government may provide in running the new storage. We would hope that, given that we have been doing that for 50-odd years, we could do that with the new supply. It is about cost and how you share the costs with the people who are going to benefit. One of the parties who are going to benefit are the downstream irrigators on Dungowan Creek. At the moment, it is an unregulated stream and the council imagines that it will become a regulated stream. One of the issues with that, we then cannot operate a storage and provide water to those customers. WaterNSW traditionally does that. So there are a number of issues that are still unresolved.

The CHAIR: Picking through those issues a little bit in relation to the costing—well, firstly, the increase in terms of gigalitres that you are expecting with the new dam and specifically Dungowan. What are you expecting that to be?

Mr LOGAN: When the concept was released, the idea was that the dam would be 22,500 megalitres. The existing one is 6,300.

The CHAIR: How much of the 22,500 megalitres do you expect to be allocated to Tamworth council as opposed to other users on the system? Has that been clarified?

Mr LOGAN: It has not been finalised yet. It is one of the questions the council has spoken to the Government about. On the early documentation released by the Government, it would appear that about seven gigalitres or 7,000 megalitres would be council's share of that water.

The CHAIR: So the remaining 14 or whatever gigalitres goes to—who are the other users in the system? Do you know?

Mr LOGAN: I imagine that obviously, as I mentioned before, there are downstream customers who will now be on a regulated stream. Before they were on an unregulated stream. Then there is the environment. The dam at the moment with the council, which has the ownership, does not have to make environmental releases per se. We are required to release certain levels of inflow. If inflow is less than 10 megalitres a day, we are required to release that inflow. But there is no environment contingency allowance or anything like that in the existing dam. That may well be introduced into the new dam. We are not aware of that at this stage.

The CHAIR: Just to be clear, I think I have always been of the assumption with the new Dungowan Dam that the existing Dungowan Dam would be decommissioned. But that is unclear, is it?

Mr LOGAN: That is certainly an option. There are some issues with the existing Dungowan Dam that, if it were to stay, there would have to be some changes to—storage would have to be reduced to address some safety concerns. But the council is keen to explore those options. At this stage, my understanding is that WaterNSW and the Government's preference is to decommission the old dam.

The CHAIR: Is there a financial risk? So there are two things that you would potentially lose as a council: the dam being under your ownership and therefore being able to sell that water as a profit to council, but also WaterNSW confirmed last week that the user-pays model will apply for funding water infrastructure or will most likely apply, I should say. That is a concern financially—a kind of double whammy, if you like.

Mr LOGAN: Yes, absolutely. We are concerned about the financial impact. At the moment the Dungowan Dam water is relatively—well, it is almost free for the council. We pay the Government some fees per megalitre, but other than operational costs there are very little other costs passed on to our community. We are concerned that, with the new dam operated by WaterNSW and owned by government, if the same charges apply that we pay from Chaffey Dam, there would be an incredible increase in the cost of water for Tamworth residents.

The CHAIR: Do you have any idea what that "incredible increase" looks like?

Mr LOGAN: We pay around $45 a megalitre for water out of Chaffey Dam and we pay about $3 a megalitre for water out of Dungowan Dam in terms of government charges.

The CHAIR: So that is at the moment?

Mr LOGAN: That is at the moment, yes.

The CHAIR: Sorry. Do you have any idea of what the expected cost is, based on the costs that you have seen? Has the council done any back of the envelope calculations or more sophisticated ones than that in terms of what the predicted cost on ratepayers and council would be?

Mr LOGAN: No. We have not done anything further on that. Our hope is that we will be able to get a better understanding of how the ownership and the operation of the dam in the pipeline will be—what the Government's proposals are—and then we would be able to have a look at costing once we get that sorted out.

The CHAIR: Okay, thank you. I might just go to the Bathurst council room now just to check whether anybody there has any comments on the line of questioning I have just asked Tamworth.

Mr STYLES: Just to pick up on the costs of management security?

The CHAIR: Yes, please.

Mr STYLES: Just to pick up on the line of costs for water from the State Government we are aware that Oberon Dam, the charges per megalitre there are $1,050 per megalitre, which highlights a very large discrepancy, given what we have heard from Tamworth. Even in Bathurst with our various systems of supply raw water costs us probably about $330 per megalitre.

The CHAIR: Did you say "bore water"?

Mr STYLES: No, raw—R-A-W.

The CHAIR: Okay, sorry. It is a little bit difficult to hear sometimes. Thank you. I will stick with Bathurst. Your submission essentially argues that that irrigators are able to take what should be town water supply released from Chifley Dam before it reaches the water filtration plant for town water users. Is that essentially what you are arguing? If you could explain what the issues are there?

Mr STURGISS: Sure. Chifley Dam is a dam that is owned by the Bathurst Regional Council. It was built in the 1960s and it was enlarged in 2000 with a total capacity of 30,000 megalitres, so 30 gigalitres. Between the dam and the Bathurst Regional Council's water filtration plant, there is approximately 4,700 megalitres of general allocation irrigation licences. So, for us to receive water at the water filtration plant, we essentially open a valve at the dam. It runs down the Campbells River into the Macquarie River where it is then pumped out from the river to our new water filtration plant. But we also need to let out enough water in these pump periods during irrigation to allow the irrigators to take what they are pumping. So we used to [inaudible].

The CHAIR: Sorry, just to interrupt, Mr Sturgiss. We missed your last sentence. I am not sure whether you could potentially move slightly closer to the microphone because we are missing a little bit. Just repeat your last sentence and maybe move around slightly closer to what you are speaking into. We did find that that helped with our session the other day. When people are quite far away from the microphone it becomes a bit tricky. Sorry: If you could, repeat your last sentence.

Mr STURGISS: Okay. I will talk up a little bit more.

The CHAIR: Thank you.

Mr STURGISS: So there are 4,700 megalitres of the licences through general allocation for irrigation between the dam and our filtration plant. We essentially need to let enough water out of the dam to have the irrigators take their share first and so that is of concern to us, given that we are not aware of what their consumption is going to be on a daily basis; nor do we have, I suppose, any involvement with allocations. The major concern we had in the 2019-20 water year was that a 100 per cent allocation to irrigation was provided during a time when Bathurst was on level 3 restrictions. So what we would like would be some increased communication between council and the State Government so we both have a better understanding of each other's needs during times of potential drought. Following on from that period where 100 per cent was granted, we sought and after five months were able to have a section 324 instrument in place to reduce the allocations available to the irrigators. That is where we would like some better clarity as to how the State provides allocations, given that we are on an unregulated river.

The CHAIR: Thank you. Just to confirm what you have said in terms of section 324 for Committee members, that is asking irrigators to not take that water that goes through. Is that correct? Then I will call Government members for questions.

Mr STURGISS: That is correct, and so essentially it is an irrigation restriction that the State Government put in place. That was put in place to a 20 per cent allocation rather than 100. So by way of comparison, unrestricted, the Bathurst Regional Council's water supply uses 6,700 megalitres per annum. At our level 3, we were certainly far reduced from that and we were very comparable with 4,700 in place for irrigation. So, yes: You are right. That 324 is a restriction on irrigation set in place by the State Government.

The Hon. BEN FRANKLIN: Thank you. I will stay with Bathurst just for a couple of questions at the beginning. At the last hearing of this Committee, the Inland Rivers Network claimed that with the recent rainfall

the need to build urgent water infrastructure has abated. You made some sort of allusion to that in your opening statement. I wonder if you would like to clarify your views around that sort of contention.

Mr STYLES: Certainly for Bathurst, the need for infrastructure has not abated. The experience we had during the last major drought highlighted quite a number of issues and potentially very significant gains through some sensible [inaudible] infrastructure. Given that we are trying to provide water security, we would like to get off with that quickly for whenever the next [inaudible] variation might arise.

The Hon. BEN FRANKLIN: What are the key pieces of infrastructure that you would like to see built for Bathurst? I appreciate your comment about the $22 million earlier. Feel free to speak to that, if you wish, as well.

Mr STYLES: We have got a planned stormwater harvesting and large efficiency program to be built which, during the last drought would have delivered about 4,700 megalitres of extra security over the three-year period. Given that our restricted take is around 3,600, that provided an enormous amount of security to see us into the future. [inaudible] we are seeking to replace the pipeline to Winburndale Dam [inaudible]. The increased yield we would gain works out [inaudible].

The CHAIR: Sorry. I am afraid I have to do this again. We just missed your last sentence, Mr Styles. Are you able to shuffle around to speak? Every time I get bad looks from Hansard. No, I do not. They are very polite.

The Hon. BEN FRANKLIN: If you could go back to the pipeline as well? I saw a particular quizzical expression on Hansard then.

Mr STYLES: All right. So, the project we have got is a new water pipeline picking up multi-source supplies, including stormwater harvesting, and taking that through treatment to the water filtration plant. As well as the replacement and upgrade of the pipeline, there is a storage dam called Winburndale Dam. Between those two, during the last drought—the three particularly difficult years—the additional yield we would have gained was around 4,700 megalitres. Our restricted take at that time was around 3,600 megalitres per annum. It provides quite a significant uplift, given the period of that drought. And given the fact that it was probably the worst drought on record, it is a pretty good example to look at. So they are the projects we are looking to get underway to provide Bathurst with a much higher level of droughtproofing during the next phase of dry conditions.

The Hon. BEN FRANKLIN: Terrific.

Mr STYLES: On top of that, a lot of great things in terms of demand management, getting everyone to be efficient, efficient showerheads, everything under the sun, so that they are sort of co-invested from two sides on the amplifying supply and managing demand.

The Hon. BEN FRANKLIN: Thank you very much. I might move to Mr Logan and start with that very question. Do you think that both of those things are important from Tamworth's point of view, that you have to obviously amplify supply but also manage demand?

Mr LOGAN: Yes, we do. We do obviously consider they are both important. As an example, there was a 2007, 2009 drought when we—sorry, 2006-07 drought when Chaffey Dam got down to 12.9 per cent, which is lower than it got during this most recent drought. As a result of that council engaged a sustainability officer and over the ensuing 12 years we have done a lot of work in relation to education of the community. I put in my submission graphs indicating population increase in Tamworth but showing that water consumption has actually fallen over that period of time. So we are certainly aware of that. However, we are also concerned that while Tamworth continues to grow there needs to be more concentration on improving water security because extended periods of drought and the city being on severe water restrictions is obviously having an impact on our ability to grow and our ability to attract new businesses and to maintain the existing businesses and population that we have.

The Hon. BEN FRANKLIN: Can I go to that? The restrictions, when the community is on level 5 restrictions, it has been said by a number of people in the Tamworth area, that allowing environmental water to be released from Chaffey Dam while people are on level 5 restrictions does not pass the pub test. My question to you is what level do you think the dam should be at when all environmental releases from the dam should cease, except obviously water for Tamworth via the pipeline?

Mr LOGAN: That is a good question. At the moment my view is that I am not sure that all environmental flows should cease. What we have been petitioning the Government to do is to store the environmental flows. Instead of releasing three megalitres of water a day every day, regardless of what the downstream conditions are, our view is that the Government should save that water, bank it in the storage and only use it when there is an actual need for it to be used. In relation to when we get into an extended drought, like we have just come out of, you expect that would be a period where we should not release any environmental water. My suggestion would

be that 20 per cent or 30 per cent would be about when that should stop. Our understanding of what dams do is supposed to mimic capturing water and then the environmental releases are supposed to mimic the flows that would have occurred in the downstream valley if the dam was not there. It is obvious that during periods of extended drought the downstream valley would have got no water, it would have been dry and if that is our purpose in environmental releases, is to mimic those flows, then there are times when they should not be released at all.

The Hon. BEN FRANKLIN: You mentioned that they should be turned off at around 20 per cent or 30 per cent, do you think that should be written into the water sharing plans?

Mr LOGAN: At the moment in our water sharing plan, no. The only thing that is—no, there is no rules about policing releases from—

The Hon. BEN FRANKLIN: Sorry, do you think it should be?

Mr LOGAN: Absolutely.

The Hon. BEN FRANKLIN: Do you think the pipeline should be used all the time?

Mr LOGAN: You are talking about the new Chaffey Dam pipeline?

The Hon. BEN FRANKLIN: Yes.

Mr LOGAN: That is certainly council's position. Again, we petitioned the Government that we feel that there are definite benefits in making use of the pipeline all the time and actually storing the water that might have been lost from in-stream losses in the dam when they are using the pipeline, as opposed to releasing it into the Peel River. We think that the Government should store that water and again release it when downstream conditions dictate to. We would save an incredible amount of water in terms of in-stream losses if we did that.

The Hon. BEN FRANKLIN: You have spoken earlier about WaterNSW engaging with Tamworth Regional Council on Dungowan Dam, obviously, as works progress. My question is, do you have any suggestions as to how that engagement could be improved?

Mr LOGAN: No, look, I think WaterNSW has done a great job, in my view, of engaging with the council and keeping us informed about where various issues are at. At the end of the day we obviously want the issues to be resolved and preferably in our favour, but at this stage WaterNSW is certainly keeping us informed and engaging us at all opportunity.

The Hon. BEN FRANKLIN: Do you think there are any ways for the Tamworth council to facilitate community engagement on the new Dungowan Dam in terms of both getting the community and businesses involved in the project and hearing their level of feedback? We have heard recently that, WaterNSW told us of a community sentiment report saying there was overwhelming support locally for the project. I am asking if you have any ideas of better or more ways to facilitate that sort of engagement?

Mr LOGAN: My view would probably be that the community thinks it is a good idea at this stage, but until we have actually seen how much additional water security we are going to get from Dungowan Dam and at what cost it is going to be to the community, it is probably a bit difficult for them to be fully informed. That is when we really will hear what the community thinks, once we get answers to those two questions.

The Hon. BEN FRANKLIN: Which I suspect will come with the business case. Thank you, Mr Logan.

The Hon. PENNY SHARPE: My first questions are to Bathurst Regional Council. You talked about your stormwater harvesting project and your replacement pipeline projects, how are they being funded?

Mr STYLES: A large chunk of it is being funded by the State Government and the rest from council. We have got $20 million in grants for the capital side of it. We have $2 million in grants for the concept and design side of it.

The Hon. PENNY SHARPE: What is the balance that council is funding?

Mr STYLES: It could be up to about $6 million we think.

The Hon. PENNY SHARPE: The funding from New South Wales, do you know where that money is coming from? Do you know which grants program?

Mr STYLES: We understand it is from Safe and Secure. There is also a [inaudible] project that was underway when we got [inaudible] drought projects. There is an upgrade to Winburndale Dam, which is the early settlement dam I mentioned earlier, it is around $11 million or $12 million, as I understand it, which council's share is $10 million.

The Hon. PENNY SHARPE: I am very interested in the issue of as it gets drier the views about people, who uses water when, become very strong. You have talked about the issue of trying to deal with people on water restrictions, then the water going down for irrigation. I am quite disturbed that there seems to be such a lack of coordination and discussion between yourselves and WaterNSW in relation to the management of that water. I want to understand how is that issue to be resolved, in your view?

Mr STYLES: We believe that we need to get to some sort of memorandum of understanding with WaterNSW on their decisions around irrigation allocation. The two uses need to coexist as it sits now. During times of predicted water shortage the system that currently sits does not serve us well. We have made quite some lobbying in that regard and we are hopeful that we will get to that memorandum of understanding position reasonably soon. We have not got there yet, but in our view it cannot continue to exist the way it has in the past because unscripted 100 per cent allocations during a very bad drought does not work for anyone.

The Hon. PENNY SHARPE: No, that is right.

Mr STURGISS: If I can add to that?

The Hon. PENNY SHARPE: Yes.

Mr STURGISS: Compounding that situation is currently the lack of metering on irrigation pumps—

The Hon. PENNY SHARPE: That was my very next question.

Mr STURGISS: So we are aware that there is requirements to have metering installed into the future but that will not necessarily reflect every single size pump that is taking water from the river. So having access to that data once metering is in place in terms of real time and also having all metres installed on all pumps would be certainly of great benefit to us.

Mr STYLES: We need to get to a point where we can manage it as efficiently as possible so that we can gain the water security we need and that includes all the different users from the water pie.

The Hon. PENNY SHARPE: Can I ask who would be a party to the memorandum of understanding?

Mr STYLES: We believe it would be council and the Department of Planning, Industry and Environment that do the allocations.

The Hon. PENNY SHARPE: So DPIE. But it would be under the water Minister?

Mr STYLES: Yes.

The Hon. PENNY SHARPE: Thank you.

Mr STYLES: We also did quite a bit of work with the irrigators when the situation got quite difficult and they were very responsive and helped a great deal with managing their use, but still and all the same we ended up with a 100 per cent allocation during a desperately dry time and we need an enduring system that allows us to manage the take of water as efficiently as possible so we can achieve water security.

The Hon. PENNY SHARPE: If I can quickly just go to Tamworth. Mr Logan, you said in your opening remarks—is he there?

The CHAIR: Mr Logan, are you still on the call?

Mr LOGAN: Yes, I can hear you.

The Hon. PENNY SHARPE: Thank you. My apologies, we just cannot see you. We can hear you. In your opening remarks you made the obvious point that you either increase the amount of raw water you have got to use or you change the existing rules. What changes has Tamworth made to the Government around the way in which the existing rules operate?

Mr LOGAN: So we have asked the Government to consider a number of changes to the water sharing plan. One of those is that at the moment we get 70 per cent or 100 per cent—when they do the allocations each year we or the local water utility gets 100 per cent of our entitlement reserved in the dam in the first year and 70 per cent in the second year. We have asked the Government to make that 100 per cent in the second year. We have asked the Government to look at the way that the allocations are undertaken and to increase under the water sharing plan when they do the annual allocation for general security uses, we want them to change. They look at historical flow up to 2010. We want the Government to change that to go until 2020, so that it includes the most recent drought—which was the worst drought on record. We have asked for more transparency in the way that allocations are made to other customers so that we can see how that is done. The water sharing plan is supposed

to be the rules by which water is shared and it does appear there is a good deal of interpretation in the water sharing plan rules—

The Hon. PENNY SHARPE: Sorry, can I just stop you. I am very interested in that because there is a lot of negotiation that goes into these plans. When you say it is supposed to be the rules and then there is interpretation, who is making those interpretations? Is there a clear line of sight around that and transparency around those decisions?

Mr LOGAN: So the Department of Planning, Industry and Environment set the allocations. Just before the start of the water year they make an assessment of the water that is available in the storage and then apply some rules and evaluate what the allocation will be for customers downstream of the particular storage. It is that application of those rules that council has asked to be more transparent in the water sharing plan and details are documented in the water sharing plan.

The Hon. PENNY SHARPE: Thank you for that. Bathurst, would that alleviate some of the concerns you were talking about in terms of the MoU? Are you captured by that or is that a way forward, the way that Tamworth has described that?

Mr STYLES: I believe the Peel River is probably regulated. Well, ours certainly is not regulated. It tends to get caught up in the decision about the unregulated rivers as a group in New South Wales, in terms of getting our 100 per cent allocation. You will see that some of the allocations for some of the major controlled State dams are much more granular and more closely thought out then just lumping the unregulated rivers together. We do not believe we are getting caught properly in the system now and that is why we think we need an MoU to deal with our specific issue because I do not imagine there are a lot of towns that control their own dam, that have an irrigation stretch—

The Hon. PENNY SHARPE: Yes, it is quite an unusual situation by the sound of it.

Mr STYLES: Yes.

The Hon. PENNY SHARPE: That is it from me.

The Hon. MARK BUTTIGIEG: Have we got time?

The CHAIR: No, we are out of time. Thank you for joining us for today's hearing and for your submissions and interest in this inquiry. That is the end of this session.

Mr STYLES: Thank you for your interest. We appreciate it.

(The witnesses withdrew.)

(Luncheon adjournment)

ROBERT BARTROP, Head of Global Business Development, Zero Mass Water, before the Committee via videoconference, sworn and examined

The Hon. MARK PEARSON: I now welcome our next witness, Mr Robert Bartrop. Would you like to make a brief opening statement to the Committee?

Mr BARTROP: Thank you, Chair, and members of the Committee for the opportunity to serve as a witness. Our technology, Source, produces clean drinking water from sunlight and air to provide an off-grid, completely renewable, non-extractive drinking water solution to homes, schools, businesses and communities. Our submission largely deals with items (d) and (e) in the terms of reference—that is, the impacts of climate change in ensuring security of water supply for social, economic and environmental outcomes, and water technologies that may promote or enhance environmental outcomes.

I would like to recap three core points that were pretty central to our submission. The first is that all of water regulation, water funding, water policy is really driven around Roman-era technology that has proven really successful for providing high-quality water to urban areas—that is, large bodies of clean water, storage, treatment and distribution in pipe networks. We recognise that that is very effective. However, in more rural and remote parts of the State that has proven ineffective, with tens of thousands of homes not actually getting any service from a water provider. We submit that policy development considers outcomes for those who are not served by water service providers and not just those who have a piped connection.

The second point is around drinkability. Water in Australia is essentially viewed as treated or untreated. However, much of that treated water, by the time it gets to the consumer, may not be drinkable, and qualities such as taste, odour, colour and a whole range of contaminants are not actually included in that consideration. We advocate a fitness for purpose approach that considers the different types of value attributed to water, such as the drinking water being much higher value and bottled water being an alternative, and then recycled or bore or untreated water being something that is perfectly suitable for many other uses like irrigation and household toilets and showers and things like that. I think we have seen a lot of examples in that bucket of places like Walgett and Menindee, where we have done projects in the last couple of years, which have far higher proportions of population drinking bottled water and drinking high-sugar drinks, and the environmental, economic and societal outcomes that drives.

The third and final core area of our submission is really that there is not a lot of contemplation for the production of water outside of ground and surface water. As our water supply looks to become more drought resilient and more climate-proof, we submit that the contemplation of technologies such as ours that look to harvest water from the atmosphere and can be done on a localised basis—producing water at the point of consumption—can have a similar impact to what we have seen renewable energy do with the decentralisation of the energy grid and what we seen cellular telephones do to the decentralisation of mobile telephone and communications networks. We submit that the role of technology and innovation should be contemplated as we look at a climate-proof water supply system in the future.

The Hon. MARK PEARSON: Thank you very much for that helpful initial statement. We will go to the crossbench. Ms Boyd from The Greens will ask you some questions now.

Ms ABIGAIL BOYD: Thank you, Mr Bartrop, for your very interesting submission and for coming to speak to us this afternoon. In your submission you talk about the hydropanels that were installed at remote Aboriginal communities in New South Wales and, as you mentioned in your opening statement, providing some high-quality drinking water and reducing community reliance on bottled water. I understand that project was funded not by Government but by philanthropists. Is that correct, and what sort of funding have you received? Is it from the Australian Renewable Energy Agency [ARENA]? What have you got?

Mr BARTROP: To your first point, you are correct: That was funded in a philanthropic way. I think that highlights the point I made that the abundance of funding to drought-related causes flows from Federal, State, local government and typically to a water service provider. Thereby—I think unintentionally—the homes that fall outside of serviced areas are excluded from those funding pools. I guess that is the case for a carve-out or an eligibility for different types of applicants that do not have a service provider. Part of the reason that is understandable is because our technology and others like it are fairly recent, so the toolkit is an age-old one, so to speak.

To your second point, yes, we did receive support from the Australian Renewable Energy Agency in 2017-18. We installed a number of sites across the country—I think 28 sites—and really demonstrated the viability

of the technology across a range of climates and applications, from hospitality to household, to community at places like Gundy in the upper Hunter Valley, which has no service. It really enabled us to set a business and train a set of installers around the country.

Ms ABIGAIL BOYD: What discussions have you had with government since? Have you been attempting to get funding from either the Federal Government or the New South Wales Government?

Mr BARTROP: We have. Actually, one of the projects we did as part of the ARENA program was at a restaurant called The Farm or Three Blue Ducks in Byron Bay, which some Committee members may be aware of. They sell our water as an alternative to plastic bottles. They have gone off plastic, but they replace bottled water with this. They use the proceeds to fund community projects. One of the projects that they funded was at Murrurundi Public School during the drought when Murrurundi, you are probably aware, was completely without water. That actually was a great project. Although it was donor funded, it gave us a chance to work with the Department of Education and NSW Health, which have both qualified the technology as eligible, which is a big step. But it has not yet found its way into water policy directly.

Ms ABIGAIL BOYD: What about the Federal level? Have you been discussing further funding opportunities with them?

Mr BARTROP: We have, yes. Obviously the water funding is very much Federal to local, which has been one of the challenges, because it is a much larger set of stakeholders. There are obvious applications for the technology in some of the Department of Foreign Affairs and Trade and foreign policy work, as you can imagine. I think the Pacific Islands are the highest per capita for water shortage in the world and in the region. That is the type of discussion we have had.

Ms ABIGAIL BOYD: Have you had much interest from local government?

Mr BARTROP: We have. I would say that local government are acutely aware of the challenges to their communities. Places like I mentioned—Walgett and Menindee, those types of places—have been very interested. A lot of the funding programs have I think fast-tracked planned projects versus incentivised incremental projects in some contexts, so your progression—we have done four or five local government projects in New South Wales, but we would like to be eligible to do far more and help those local governments which, in a western New South Wales sense, probably half of their ratepayers are actually outside the service area. Those inside the service area have a much higher proportion of bottled water and sugar drinks consumption. We would like to be eligible to participate in partnership with those governments to provide more outcomes.

Ms ABIGAIL BOYD: Are there other companies offering similar services or similar technologies to yours?

Mr BARTROP: Effectively, no, which is one of the challenges. What I would say is there is a lot of exciting technology. There is a lot of technology in the bulk water space that is a great complement. I would submit that an ideal off-grid living scenario is a rainwater tank plus Source Hydropanels, so you use the rainwater for general household uses and our product for drinking water. We have done a lot of that type of work with Indigenous groups around the world. I also think that complements a smart-grid approach in water where whole communities can be a lot more efficient with recycled water without having the constraint of drinking. We saw in Toowoomba a decade or two ago that the community resisted a more holistic recycled water approach because of the concerns on drinking it. An independent, fit-for-purpose drinking water supply can help remove that constraint in some ways.

Ms ABIGAIL BOYD: Can you give us an idea of the relative cost of this technology compared to other sources of drinking water?

Mr BARTROP: Absolutely. The conditional answer to that is we do not compete in places like Sydney. The best thing to do in Sydney is to drink Sydney water. We are very supportive of utility supply. In places where there is not utility supply or that utility supply is not drinkable, the alternative is bottled water. We are less than 10 per cent of the cost of bottled water, so we sit between tap water, which is regarded often as essentially free—but a lot closer to that than bottled water or other forms of bulk water hauling. We note that tap water is also constrained by the water that needs to flow through the tap, so the pipe is not helpful if there is no water to flow through it. Obviously, when you get to the fringe and the very extent and the end of the grid, that becomes a much more real concern in a drought scenario.

Ms ABIGAIL BOYD: The cost is less than 10 per cent of the cost of bottled water?

Mr BARTROP: Yes.

Ms ABIGAIL BOYD: What would bring the cost down?

Mr BARTROP: There are three primary drivers to that. One is scale, which is why this discussion is important for us. To get from a philanthropic into more of a policy environment, we see the chance to get very close to where bulk water supply is in remote areas. Two is local demonstration: the ability to then train labour forces around the State to install and maintain. One of the benefits to being off grid is that you do not need to be an electrician or a plumber. It is a very low skill set, which is attractive for regional areas where that type of handyman skill set is prevalent. The third thing is technology. Our technology is probably where solar photovoltaics was in the year 2000. We have got a pretty aggressive road map for more production and lower cost per unit, which is rapidly coming down the cost curve.

Ms ABIGAIL BOYD: When you talk about the numbers of jobs—as everybody knows, at the moment jobs are incredibly important to policy makers—what sort of jobs and how many jobs are we talking for each town?

Mr BARTROP: It is really limited by the amount of people. There are tens of thousands of households in New South Wales where straightaway this would be an improvement because they do not have supply. The estimate we have is around 50,000, and probably the same again of places where people do not necessarily drink the water for various reasons. That is definitely a job production potential of many thousands. I would say it is the type of job, as I mentioned, which has a low barrier to entry for regional communities, which is important. It is also a chance for those communities to participate in innovative technology versus really low labour like a more traditional labour role. It is actually a very entrepreneurial and innovative opportunity, which we think has some socio-economic benefits as well.

Ms ABIGAIL BOYD: Thank you. It sounds very interesting.

The Hon. MARK PEARSON: I have one or two questions. Let us look at a town like Tamworth, which is probably one of the towns facing the most serious likelihood that it will run out of water. How many of these panels would be required just to give assurance to a town of that size that drinking water will not run out? Would it be done in each individual house and backyard, or could it be done on a larger scale, pumping the water through to households?

Mr BARTROP: I will probably give you an unexpected answer to that. I would say for a town the size of Tamworth, some of the existing policy initiatives like building new pipelines and dams and things are probably the best approach for that security. I would say for every regional and remote town in Australia, there is another town or a village outside of that which has an even more severe problem: towns like Goodooga in the north of the State; towns like Gingie Reserve, which is outside of Walgett. I would say for a town-level solution, it is probably the towns that are under a couple of hundred people where we are the best fit. For a town like Tamworth—

The Hon. MARK PEARSON: Sorry, can I just ask you a question there? If we are talking about X number of litres per person in the town to be absolutely certain that there will not be a shortage of drinking water, why can it not be multiplied to be suitable for a larger town?

Mr BARTROP: It very much can, and those numbers can be calculated. I think the point I am making is the business case for more traditional solutions like pipelines is far greater when there is high density, like a town of Tamworth's size. The same cannot be said for a smaller town, where the business case for a long pipeline upgrade will never make sense. The opportunity that we see is more on the household level and on the smaller town or village—if you wanted to use that word—level. I would say that even in an upgrade scenario at Tamworth, there is still very robust bottled water sales at the local IGA or the local Woolworths. I can assure you that not only would we be able to provide that same quality of water, potentially in a circular fashion, from one of those outlets at a dramatically lower cost to reduce the cost of living, but also far more sustainably and from a source actually local to or within that community, not something that is hauled in from the Northern Rivers of New South Wales. When you talk about resilience and health, we would complement the bulk water solutions somewhere like Tamworth, but be more of a household or community solution for a more remote location.

The Hon. MARK PEARSON: Thank you, that gives a lot of clarification.

The Hon. BEN FRANKLIN: Mr Bartrop, thank you for being here today. I have to say that I find this idea and what you have done really impressive. I am the Parliamentary Secretary for energy in the Government. When you started, I wrote down that this is exactly like energy at the end of a transmission line—how you try to make those communities self-sustaining. You used exactly the same analogy, and I think it is terrific. Did I hear correctly that you are the only provider of this technology in the country?

Mr BARTROP: We are—actually in the world. We are the only producer of what we call a hydropanel, which is off grid. I am happy to go into the detail of the technology but, yes, we are unique.

The Hon. BEN FRANKLIN: I presume the partial answer to the question that the Hon. Mark Pearson asked before about why you do not do this in Tamworth is because the cost would just be prohibitive compared to other solutions—or that would be one reason?

Mr BARTROP: The question that was asked was about a full bulk water solution. We essentially segregate the water into the higher-value portion, which people drink. We could definitely do a Tamworth-level solution for drinking water that would complement other sources.

The Hon. BEN FRANKLIN: You focus on, as you say, the highest quality and would look to other solutions for the other water needs in a community. Can you give us an idea of the time that these things take? For a household, how much time would it take to provide the daily need? Will you be able to get the daily need for a family of four, or do you need storage as well? I am trying to get my head around how this actually works.

Mr BARTROP: I will give you a personal example which is always the best one. I am actually in the States currently in Arizona where our headquarters is. My family of four has two panels on the roof and that is all of the water we drink. We use city water for all of the other household uses. That is what we do and this is 10 per cent relative humidity; it is kind of the equivalent of living in Alice Springs. We can add more panels, so for a multi-family home you can add more panels and each panel will store about a weeks worth of production. Given your energy interest, the one thing that is different with energy is that storing it is really difficult and expensive. With water, it is a lot simpler and so we have actually got tanks inside the panels, which are called reservoirs, and on community solutions we use a shipping container for a 20,000 litre solution.

The Hon. BEN FRANKLIN: We are getting there on the energy storage; it is just not quite as easy as it is with water. You showed in your submission a number of different installations at the Gundy Soldiers' Memorial Hall and some remote Aboriginal communities, which is great. Can you give me an idea of the quantum of locations that you are currently providing water for and the number of people?

Mr BARTROP: Sure. In Australia we have probably done 100 sites. Then globally, many times more than that. I think we are in 48 countries.

The Hon. BEN FRANKLIN: So in Australia, in the 100 sites, how many people would that be providing drinking water for?

Mr BARTROP: It is definitely in the thousands. I have not got a real-time point of data on that, but definitely in the thousands and I would say, predominantly in rural and remote communities. As you are aware, Australia is the highest and lowest densely inhabited continent on earth and so it is a really good proof point for these type of end-of-grid technologies outside of the urban areas.

The Hon. BEN FRANKLIN: Yes, which is great for solar panels but not so great for drinking water.

Mr BARTROP: Correct.

The Hon. BEN FRANKLIN: This is a great idea.

Mr BARTROP: Yes.

The Hon. BEN FRANKLIN: This solves a specific problem really effectively and innovatively. To me it would appear that we need to connect people like you and your organisation. There is no doubt another range of ideas out there that are going to be valuable in this space. What has your experience been when connecting and interacting with local water utilities and councils? I would have though that a range of councils in western New South Wales would be the perfect people to partner with potentially. What can we do better to ensure that those connections and links are made for organisations and individuals like you?

Mr BARTROP: Thank you for the offer. I would say in water, relative to energy and telecommunications, decentralised technology and innovation is a less common feature, so I think at some level I would observe that the stakeholders are more used to a particular type of solution versus the rapid innovation that has occurred in other segments. I think an example of that is incremental help. It is a little bit or nothing in water; you either get boundless amounts of perfect water or you do not get served. If you look at mobile telephones, it is a huge thing for a farmhouse to get one or two bars of reception. It may not mean that you are streaming Netflix as affordably as you would if you had broadband but you are able to communicate. So the incremental improvement, even though it is higher per minute, makes your life better effectively and I would say energy is very similar.

What I think would be helpful as it relates to local governments is I think it is a big burden on local governments, which are often under-resourced and the water experts are often a much smaller team. It is a big burden for them to take a risk on a new technology or to get to know a new technology and, as I said, a lot of their water planning is already kind of thought through, so funding packages tend to fast-track their existing plans.

What would be a helpful State Government initiative would be something that potentially earmarked incremental funding or carved out funding for more outcomes-focused things—like we are talking about in this instance,—so some funding packages which would be incremental opportunity for those local governments to offer a rebate or provide a solution to an unserved area in their population. Our role in connecting local governments with existing State programs would obviously be a lot easier than trying to navigate multiple tiers of government at the same time.

The Hon. BEN FRANKLIN: That is very helpful. When was your business established?

Mr BARTROP: A company in 2015 incorporated; Australian entity in 2017.

The Hon. BEN FRANKLIN: So basically it is in the last five years that you have established these hundreds of sites across the world.

Mr BARTROP: Exactly.

The Hon. BEN FRANKLIN: In 48 countries.

Mr BARTROP: Yes, exactly. A lot in the past two or three years.

The Hon. BEN FRANKLIN: In terms of the cost, is it just a one-off cost to get the panels put on the roof or is there a licensing fee that continues after that with support and maintenance? How does it work cost-wise?

Mr BARTROP: For programs in Australia we can do up-front costs and include a long-term—like five years—warranty and service agreement with that, after which there would be a nominal annual fee for replacing a filter. For larger projects, with communities and people in the private sector like hospitality and mining who are large consumers of bottled water, we also offer a service agreement which is very similar to a power purchase agreement. We call it a water purchase agreement which nails customers to buy per litre over time. So, again, for people who consume large amounts of bottled water, it is a switch and save which has proved popular in commercial and industrial applications. We would like to do the same in community applications, so you could imagine somewhere like Walgett where people could at least come and refill a reusable 15-litre container for a dollar instead of spending $8 or $10 or more at Woolworths or Neverfail. That kind of local circular approach is enabled and that could potentially be self-funding but would involve some collaboration with local and State governments.

The Hon. BEN FRANKLIN: I think this is terrific. Thank you for being here.

The Hon. MARK PEARSON: Are there any weather conditions in which the apparatus does not work or works very minimally?

Mr BARTROP: Surprisingly, it is unique in that it worked really well across a range of weather conditions. As I said, humidity is the most common question we get and where I am is even less than 10 per cent humidity and we get really good results. So I would say New South Wales is an ideal location statewide. The storing and dispensing of water gets more challenging when you get a really deep freeze, so we probably will not be rushing to do a snow-based installation on Mount Kosciuszko anytime soon, but other than that even frosts and things are fine. It is more just if you get multiple days below zero where it is harder to dispense the water. It still produces the water but effectively New South Wales and Australia are a really good location. Sunlight is the most important input.

The Hon. PENNY SHARPE: I wanted to ask you about the quality of the water in the use for things like renal dialysis. The reason being that if you are working in Aboriginal communities there are real issues around people accessing clean water so they can then do renal dialysis at home. Are you aware that you are able to use that as an application?

Mr BARTROP: Absolutely. We do not target that specifically, but we do have a number of customers who spend a lot of money getting high quality water for medical uses like that as well as other scientific uses. Some customers even opt for things like hydrogen in the energy space, where they are looking for an off-grid water solution. So there is a broader range of needs for clean water, and that is absolutely a part of our business.

The Hon. PENNY SHARPE: I just noticed that you do mineral work with the high quality water, but it is at a standard that is higher than normal Sydney tap water, for example, which is fine. So are you aware of a problem with the renal dialysis issue?

Mr BARTROP: I have not looked at that issue because I am not a medical expert in that specific area. We create our water from the air, so we effectively produce distilled water. That makes it different from other water technologies in that we are not cleaning dirty water as much as we are mineralising distilled water. We are

adding calcium and magnesium, which increases the pH and makes it more palatable, creating more of a Mount Franklin taste, versus distilled water, which is quite acidic. Obviously if you did not add the minerals, there are fairly niche applications, like the one that you discussed, on which we work with service providers to determine whether it is a good fit or not. One of the things we notice is the prevalence of health issues in remote communities, like obesity, diabetes and heart disease, has a fairly tangible link to the amount of sugar consumed by its members. If you look at some of the reports, like the one done by The Australian National University that link the consumption of high-sugar beverages and the trust in drinking water in regional areas compared to urban areas, there is a preventative element as well as a treatment opportunity.

The Hon. PENNY SHARPE: Places like Broken Hill cannot use tanks because of the lead poisoning in relation to the dust and those kinds of things, does your technology alleviate the problems around places like Broken Hill?

Mr BARTROP: It would not alleviate the problems in a tank. Our technology is well proven, both scientifically and in the field, not to absorb any trace contaminants. We have had the same types of questions in places like Muswellbrook, where there is coal ash in the air. Rainwater tanks and surface water generally have that risk. Our technology is actually material-based, so we use an absorbent material to extract the water from the air in a similar way to the way that sugar will clump when you leave the lid off a sugar bowl. We then condense the water from that material using heat from the sun in the same way that steam in a shower will condense not because the wall is cold but because the steam is hot. Because there is that two-step process, we remove the risk that there are contaminants in the air that flow through to the water. So that really solves that problem. The issue that you mentioned of the ageing infrastructure, and the PFAS/PFOS issues—any place where there is water that people do not want to drink, we provide an alternative that people can drink.

The Hon. PENNY SHARPE: The one thing that I was not sure about—I was looking at some of your case studies and it was unclear to me how much two panels gives you per day, and under what circumstances?

Mr BARTROP: For a broad, typical New South Wales installation, two panels will give you about 300 litres per month capacity. That is the equivalent of a 20-pack of Mount Franklin on a daily basis at a household level. That complements the existing water supply, and it also stores seven times that much in a reservoir. That means that the two panels will have about 60 litres of storage capacity that is renewably popping up. When you do a school or something like that, you get to use that reservoir and store the water on weekends and then address higher demand in the warmer months.

The Hon. MARK BUTTIGIEG: It is fascinating technology, obviously. In terms of the economics of it, which you touched on before, we are at the point where—and we have heard this from previous evidence—the marginal cost of water infrastructure is going through the roof as a function of drought and climate change. So I suppose that makes these technologies more and more attractive as each year goes by. How much more upward slope on the technological curve is there? Is there room for a lot more efficiency improvements on your technology, or has it plateaued to the point where you have pretty much squeezed as much out of that lemon as you can? I am trying to get a feel for where the pinch point is to the point where people say that they should be doing this at scale.

Mr BARTROP: We are definitely not at the pinch point. We have got a fairly aggressive future-looking road map. We think that this is definitely a case for the structural barriers to be more considerate of technology playing a role in the mix. I think it is now definitely the case where we have a view of long-term sustainability on a subsidised basis. So there is significant room for improvement. Going back to some of the value comments I made, I will make a quick comment on the marginal cost issue that you mentioned. A lot of water infrastructure will appear to have a low marginal cost if you look at it on an unsubsidised basis—five cents a litre, two cents a litre, one cent a litre—but it is reliant on very high volumes of water to justify that. So the absolute cost may be very high and the marginal cost will look low.

Our technology will have a much lower absolute cost and a slightly higher—it might be by 10 cents a litre—marginal cost, which can often cause some confusion with stakeholders. The example I will give is if you have one million litres in one place a day, we can offer that million litres in a million different places effectively. The ability to not have a single point of delivery but to deliver water to where people are and where people need it offers a marginal cost benefit but it also carries significant distribution costs which often are not factored in. I do not know if that is confusing or helpful, but there is definitely a different set of conclusions if you look at total cost versus marginal cost on some of these projects.

The Hon. MARK BUTTIGIEG: This is somewhat unfortunate but like a lot of these things, do you get the feeling that until the market looks at this in the cold, hard light of reality and says, "Well, this stuff is working on a cost basis, let's go there"—are you getting the feeling that the Government is being proactive with

this and saying that this is probably something it should be looking at investing heavily in to increase that transition? Or is it a case of eventually it is going to happen because the economics will just be overwhelming.

Mr BARTROP: The private sector—our submission was not really looking at our private-sector business, but definitely mining companies, hospitality entities and people who consume a lot of bottled water can definitely make that decision themselves. When you look at the more underserved elements and the households that are outside of the water service areas in New South Wales, they are actually restricted from participating in the existing funding streams because of the policy mandates and the regulations. As I said, I do not think that is an intentional thing but I think the Government—if policy were to look at outcomes, in this case climate resilience and the environmental, economic and social outcomes, and look at the people who live in these remote towns and areas not served by these water utilities then opening up those groups of people towards funding streams and technologies that can solve a problem they have is definitely an opportunity for the Government.

The Hon. MARK PEARSON: That concludes our questions. Thank you very much. Your information has been very helpful. What you are doing is a fascinating innovation.

Mr BARTROP: Thank you very much for the opportunity.

(The witness withdrew.)

JOHN RICHARDS, Vice President, Peel Valley Water Users Association Inc., before the Committee via videoconference, affirmed and examined

DAVID GOWING, Committee Member, Peel Valley Water Users Association Inc., before the Committee via teleconference, sworn and examined

ILDU MONTICONE, Committee Member, Peel Valley Water Users Association Inc., before the Committee via teleconference, affirmed and examined

The Hon. MARK PEARSON: Mr Richards, I invite you to make a short opening statement.

Mr RICHARDS: I certainly would like to state that we are fundamentally in favour of [inaudible].

The Hon. MARK PEARSON: Excuse me, Mr Richards. Could you move whatever you are reading directly in front of you? When you are looking directly at us, we seem to capture your voice much better for Hansard and for us.

Mr RICHARDS: As I said, I am fundamentally in favour of the construction of new water infrastructure in the Peel valley for the twin purposes of increasing the volume and reliability of supply to Tamworth Regional Council and improving the reliability and available water determination for the general security water licence holders in the Peel regulated system. As a water users association, we represent about 182 licence holders in the Peel regulated system and 184 licence holders in the Peel Alluvium water system. Those allocations are considerably important to the regional agricultural area.

I can go into some more detail about how that agricultural production is important, but I think that the main thing that we want to put forward is that, although many of the general security licence holders are also only part-time irrigators while they or other family members hold down other jobs, they are an important underpinning for the [inaudible] supporting and being supported by many local businesses who sell rural produce or irrigation equipment. They supply an important part of the total produce coming from the water plan area. These irrigation farmers have been badly impacted by the drought, as it has been shown, and have shown the insecurity of the supply from Chaffey Dam under the current management regime. As an example, the irrigators had zero allocation last year and zero allocation this year to date. I have some further comments that are specifically about the terms of reference, Chair, but I am happy to leave those for questions and let the others have a chance to make their statement.

The Hon. MARK PEARSON: Mr Gowing, do you have an opening statement?

Mr GOWING: I do not generally have an opening statement except to state that we are in favour of increased water being available throughout the State. I was of the understanding that Mr Monticone was going to make the opening statement on our behalf.

The Hon. MARK PEARSON: Thank you. Mr Monticone?

Mr MONTICONE: Good afternoon and thank you very much for this opportunity to discuss our views with the members of the Committee at this hearing. We reiterate that we support the construction of a new dam at Dungowan because we support any action that conserves water in the inland regions of New South Wales. We also acknowledge that the principal purpose of the new Dungowan Dam is to improve water availability for Tamworth Regional Council; however, we remain concerned that there is a lack of information about the implications of the new dam on the irrigation industry in the Peel valley. Our main concerns are in the two following areas: first, possible changes to accessing water for irrigation in the Peel valley and, second, possible increases in charges for water in the Peel valley. But in summary we are in favour of the construction of Dungowan Dam and the sooner that the unknown factors can be resolved, the better.

Ms ABIGAIL BOYD: I note that I was having difficulty hearing Mr Monticone, but I think I did hear so hopefully he can hear me as well. We will see how we go. Your submission is, as I understand it, in favour of a new Dungowan Dam. Do you view that as being the best value for money for shoring up the water supply for Tamworth?

Mr MONTICONE: On behalf of the group, I do not know that it is within our capability to answer that question. I do not know that we have any relevant facts. I do not think that we have the relevant information to answer the question properly because we do not really know what the cost of the other options are and what the benefits and how much water would be available from other options.

Ms ABIGAIL BOYD: Fair enough.

Mr GOWING: I would reiterate that statement. I suspect that is possibly not the best value for money, but it is probably the only option available within the resources that are probably available. The need for water in the Tamworth area in the future will far exceed the capacity of the proposed Dungowan Dam in my opinion. I really wonder whether some other form of supplying water such as the Clarence scheme—and I am not saying that that should be—I think we need a much greater source of water than will be available in the Dungowan Dam and that is the problem. As to saying whether it is the best value for money, I have absolutely no information.

Mr RICHARDS: Obviously, Tamworth Regional Council has done quite a lot of work on this issue about what the alternative water supplies are, including looking to establish something at Keepit Dam or Split Rock Dam. They, as I understand, involve Hunter Water to help provide them with [inaudible]. I do feel that all of the potential solutions had problems and, although Dungowan Dam may still have some questions, it does seem as though it is the most immediately able to be constructed and most obvious solution to the current issues in front of the Tamworth district. As both my colleagues have suggested, it may not be the total answer but the current Dungowan Dam is six gigalitres. The proposed dam is 23 gigalitres. The increase in average available water per year for Tamworth would be something like seven gigalitres, according to WaterNSW, and that is nearly three-quarters of what it uses at the moment. So it is a pretty significant increase in supply for Tamworth. The dam size sounds reasonable. Although we do not know whether it is the best value for money it is certainly, we think, the most likely candidate that is out there on the market at the moment

Ms ABIGAIL BOYD: Thank you. I understand that the upgrade of Chaffey Dam did not end up improving Tamworth's water security in the most recent drought because of the water allocation policy in the Peel Valley, which was based on the drought record prior to 2010. What would be needed in order for the Dungowan upgrade to actually result in improving Tamworth's water security, do you think?

Mr MONTICONE: I think one of the problems since the upgrade of Chaffey Dam has been the lack of rain so the shortage of water in Tamworth is not so much a result of the operations of Chaffey Dam. It is more to do with the lack of rainfall. I think if the same situation occurred after the new Dungowan Dam is built if there is a lack of rainfall similar to what had occurred since the construction of Chaffey Dam, then I think you will find that Tamworth again will be running short of water—maybe not as desperately short of water as they have been on this occasion, but certainly if there is no rain the dam cannot store the water.

The Hon. MARK PEARSON: Is what you are saying essentially that dams actually do not make more water, but they just hold the water. If it does not rain, we are not going to get more water anywhere. You are kind of dispelling a bit the myth that somehow there is this view that dams give a guarantee of water. Is that what you are saying?

Mr MONTICONE: What I am saying is that if you have got more water storage capacity, you are less likely to run short of water. But just having another dam it does not automatically guarantee that you will never run short of water.

The Hon. MARK PEARSON: Thank you.

Ms ABIGAIL BOYD: Mr Gowing, do you have a comment on that?

Mr GOWING: I am agreeing with Ildu Monticone—that the more storage have, the longer you can last. If you store it so that every time you get more storage, the Tamworth area will last longer, as Ildu Monticone has stated. But I am also saying that I believe that the total capacity even now is inadequate for the future needs of the Tamworth city, especially if the population increases to a hundred thousand, which is predicted by the council.

Ms ABIGAIL BOYD: And Mr Richards?

Mr RICHARDS: Look, I know the Tamworth council has been suggesting that their problems would have been over if they had been able to take the last 10 years and add that into the sort of drought record. I do not necessarily agree that that is the case. I think, you know, perhaps we do not see how the available water [inaudible] has to be applied. There is not a lot of transparency and I do not—

The Hon. MARK PEARSON: I am sorry, Mr Richards. We just had a bit of a problem there hearing the last two sentences. Could you say them again?

Mr RICHARDS: Well, I am just suggesting that the available water determinations are not always completely transparent how they are arrived at. The judgements that are used involve some expectation of what is going to flow into the system and dictates what is going to be used from the system. I think that there is room within those available water determinations to have managed the water over the last 22 years in a way that would have helped provide Tamworth with a little more secure water supply, although it still obviously would not have improved things when it does not rain in the way it did rain over the past couple of years. So I do not think changing the rainfall record is going to do anything except cause a whole lot of [inaudible] who are in the water

plan—the Murray-Darling Basin Plan—to have to be completely revised. I do not think that that would necessarily give the Tamworth council any great [inaudible].

Ms ABIGAIL BOYD: I am just trying to understand this. Even if we have the expansion of the Dungowan Dam, assuming that we have enough water being stored in there, the argument then is that, as a result of the Tamworth Regional Council being able to store more water, the available water determination at the start of the season would need to be increased as well. If that is correct, how does that then sit with WaterNSW and the Department of Planning, Industry and Environment having confirmed that the dams are not intended to increase the STL and therefore not increase the amount of water available to licence holders? If that overall amount cannot be increased, is your submission based on the idea that nevertheless there would be an increased amount available to the irrigators?

Mr MONTICONE: Our submission indicated that there are a lot of grey areas. We do not know what the licensing arrangement is for the proposed Dungowan Dam and therefore we do not know what impact any of that is going to have on the Peel water-sharing plan. If Tamworth council is the owner and the operator of the new Dungowan Dam, then the existing water-sharing plan probably will remain—I do not know; I cannot say probably. It may remain unchanged in terms of calculating the available water determination. I guess our submission was trying to point out that there are so many things that are unknown about the dam that we have concerns that people simply do not know and cannot plan any business decisions because there is a lack of knowledge. We would like that lack of knowledge to be overcome as soon as possible.

Ms ABIGAIL BOYD: Do either of the others want to comment on that?

Mr GOWING: I had a lot of difficulty of hearing that question, I am sorry, with the phone connection.

The Hon. MARK PEARSON: Ms Boyd, could you repeat the question, please?

Ms ABIGAIL BOYD: I am running out of time. Perhaps we could check with Mr Richards if he has a response and then I will pass over to my colleagues.

The Hon. MARK PEARSON: Okay, sure. It was a spontaneous question.

Mr RICHARDS: If I can just make a quick comment. We do believe that if the Tamworth Regional Council is given a significant allocation out of Dungowan Dam that that would be the most obvious place for them to use most of their water. As a result, they hold a six gigalitre allocation in Chaffey Dam. [Inaudible].

The Hon. MARK PEARSON: I am sorry, Mr Richards. Could you just have your piece of paper with that information directly in front of you? I ask because when you look directly ahead at us, we hear you very clearly. As soon as you move your head to the left or right, it becomes difficult. Sorry to be so restrictive.

Mr RICHARDS: My apologies. Can you hear me?

The Hon. MARK PEARSON: You do not have to apologise. Yes, perfectly, thank you.

Mr RICHARDS: We believe that if Tamworth Regional Council are granted the allocation out of Dungowan Dam it may take the pressure off the level of usage that they have in Chaffey Dam and as a result, although there will be no more allocation issued for the irrigation industry, we may get a slightly better average available water [inaudible]. When I looked at the numbers over the last 10 years, we only started out with 33 per cent of our allocation as an available water determination on average, and then at the end of the year we finished up with 43 per cent. So it is a pretty low percentage of the water that you are purchasing or using as an allocation. I think that is our belief, that the Dungowan Dam will provide more security for Tamworth, but because it takes some of the pressure off Chaffey Dam it will also supply more security for both the general security holders and the environmental [inaudible] managed under the same condition.

The Hon. BEN FRANKLIN: Thanks for the three of you being here with us today. Obviously, the situation that Tamworth and the broader community has gone through over the last few years has been extraordinary and incredibly challenging and we appreciate your engagement in this process in trying to work out how we do not have to face at least the severity of this sort of situation again, if it can be avoided. To that issue, obviously the Peel Valley Water Users Association is a critical group and organisation in this space in the New England. I would like to start by asking whoever, or indeed all three of you, has a view on this, how can the New South Wales Government, of which I am a proudly a part, improve our engagement with your group moving forward?

Mr MONTICONE: I accept we have a reasonable level of communication with WaterNSW and DPI Water at the moment. However, I do not think that it has been quite as far as the decisions that are relevant to us regarding Dungowan Dam. I think in most other circumstances the level of communication with our water group

is adequate. I mean there is always room for improvement, but it is adequate. The thing that is missing is information that could impact on the irrigation industry regarding the new Dungowan Dam.

The Hon. BEN FRANKLIN: To reaffirm, you are supportive of the concept of the dam but you want more information on the logistics of how it is actually going to work and the potential cost impacts on your members?

Mr MONTICONE: That is correct.

The Hon. BEN FRANKLIN: Mr Richards, did you want to add anything?

Mr RICHARDS: Look, I think that summed it up pretty well. We do have reasonable engagement with WaterNSW big time, but in this case I do not think that many of the issues that we are interested in have yet been resolved and certainly it appears that there is a fair bit of work to do to sort out the fine detail on how the new dam is going to be constructed, who is going to be the owner, what the allocations out of the new dam going to be and what then are the implications for the existing users both cost-wise and reliability-wise. So we understand that that is a difficult basket but would encourage the Government to engage regularly and share with us what you do know.

The Hon. BEN FRANKLIN: Thank you, that is helpful. Can I move to the issue of water sharing plans and ask if your organisation thinks it is fair to say that water sharing plans cannot be made under a one size fits all model? They have to be tailored and bespoke for each area.

Mr MONTICONE: I would agree with that statement. There are very, very different conditions for irrigating between just the Peel and the Namoi, and the Peel and the Namoi adjoining valleys, but in the Namoi there is a lot of on-farm storage, whereas there is none in the Peel. The crops that are grown in the two valleys are quite different. So that is just comparing our valley to that valley, but I think that it is essential that the water sharing plans are done at a valley basis. However, we have looked at combining the Peel and the Namoi for extraction purposes because that would solve a few problems. However, that is another issue and probably outside the domain of this inquiry.

The Hon. BEN FRANKLIN: Mr Gowing, would you agree with what Mr Monticone just said?

Mr GOWING: Yes. I just have a comment going back to the previous question. I am not suggesting that our information that we receive from DPI Water and WaterNSW is quite as good as being suggested. Speaking generally, we often have to wait a long time and at times never get a reply to some of our questions. As for the particular aspects of the Dungowan Dam, I think that a lot of the information is—no decision has yet been made and that is part of the difficulty that we have in getting the information back and I am wondering whether we should be given greater input in the decisions before they are made.

The Hon. BEN FRANKLIN: Back on the water sharing plans and whether you agree that they need to be bespoke for each area and you cannot have a one size fits all model?

Mr GOWING: I think they do need to remain in the valley. I do not believe that we have ever had adequate input into the Peel's water sharing plan. In the early days before I was anything to do with this organisation, my understanding was that they were using computer modelling that has been replaced by more up to date things and some of those issues have never been sorted out.

The Hon. BEN FRANKLIN: How do you think the existing water sharing plan for the Peel Valley should be changed then?

Mr GOWING: Well, the amount of water that irrigator's are entitled to is in the order of 33,000 megalitres and they are capped at around 6,000 megalitres, which is way out of whack in my opinion. The environment in actual fact gets more water than the irrigators do, and yet the irrigators use less than 5 per cent of the flow of the Peel River. So I am thinking that a lot of work needs to go to source some more equitable use in that respect.

The Hon. BEN FRANKLIN: Mr Richards, would you like to add anything about how you think the existing water sharing plan for the valley should be changed?

Mr RICHARDS: I think Mr Gowing has made a good point there about the way the modelling was done for the long term average annual extraction limit and I would encourage the water sharing plan to have a look at that average and see whether they think it is appropriate. Certainly our history is the best [inaudible] it was not particularly appropriate. The question about whether—I know that Natural Resources Commission has recommended that the alluvial water in the Peel area be capped with the Namoi alluvial water sharing plan, the unregulated water sharing plan now be included with all the other regulated streams in the Namoi. But it looks as though the Peel area is going to have four unregulated, four water sharing plans, which does seem a little crazy to

me without understanding the environment [inaudible]. I am a bit of a recent arrival into the field and I do not quite understand what the logic was for doing that. In the Peel we have a quick flowing river, we have no water storages, we do not have people growing cotton, we do not have large access to unregulated flows as they do in the Lower Namoi and I think it is a very different beast and should certainly have that recognised in producing water sharing plan forums.

The Hon. BEN FRANKLIN: Thanks Mr Richards.

Mr RICHARDS: There are lots of different things that—

The Hon. BEN FRANKLIN: Thank you, Mr Monticone, did you want to add anything to that?

Mr MONTICONE: No, I am happy with that thank you.

The Hon. BEN FRANKLIN: My final question is a broad one, I guess, just pulling out and looking at the full issue and just asking for your comments on basically this. How do we ensure that into the future, obviously with climate change and all of the subsequent impacts of that, we can manage our water to allow for critical town water supply, the environment and an active agriculture and irrigation sector? How do we get the balance between the three of them right? If you have some general comments that you would like to share with us, that would be appreciated?

Mr MONTICONE: There are a couple of issues there. In any policy decisions it would be good to involve all stakeholders and that does not appear to be the case at the moment. The second thing is in regard to the environmental water, in the Peel Valley more water goes to the environment than goes to agricultural production even though the dam was originally constructed for irrigation purposes. Mr Gowing is right, 95 per cent of the water in the Peel River flows out into the Namoi—the long-term average flow—and on that basis both council and the irrigators use less then 5 per cent out of the Peel annually.

The question really ought to be looked at as to whether there is a genuine need for the level of environmental water at the moment. We would really like to see what measurable benefits are produced from that excessive amount of water—given all the circumstances it seems an excessive amount of water and an unbalanced amount of water. We would like to see that looked at. With regards to meeting the critical water needs, I think there is a need to look very carefully at what sized towns can be sustained in inland New South Wales. It is not appropriate—not appropriate—to go ahead and plan for cities of 100,000 people and industry supporting 100,000 people if there is no way of providing the relevant amount of water because what happens is more and more water is taken for council use and the only place to take it is from the irrigators. We do not believe that is appropriate. The dam was originally built for irrigation purposes and what needs to be done is Tamworth's growth projections really need to be assessed by somebody who can tell us whether they are relevant.

The Hon. MARK PEARSON: Thank you very much for that evidence. We will now move over to the Opposition for questions.

The Hon. MARK BUTTIGIEG: My question follows on from that point you were making in terms of that population growth projection. Is that based on what is happening at the moment and projecting into the future based on migration to Tamworth or has anything been put in place—or any caveats in place—to say that as long as we get an increase in water supply we can sustain the population? It seems as though from what you are saying that the two are divorced.

Mr MONTICONE: Yes, it certainly does seem that the two are divorced and it seems that the cart has been placed in front of the horse because Tamworth Regional Council has a Blueprint 100, which is a call to reach a 100,000 population, doubling the existing 50,000 up to 100,000—and they want to achieve it by about 2040. Somebody somewhere ought to look at whether that is a realistic goal.

The Hon. MARK BUTTIGIEG: We have heard evidence over the last few days' hearings of obvious supply constraints. I think it is uncontroversial of me to say these are undeniable in terms of average rainfall appears to be declining hand over fist as a result of climate change. Even if it is not, your ability to capture it over a longer period of time is becoming more and more expensive by virtue of the cost of building these dams and raising the dam walls. You have touched on some of this before but given the fact there has been no cost benefit analysis to date, is it fair to say we are not in a position to judge whether or not this is a viable project until we get that hard analysis? If there are water-saving measures available and more efficient technologies, we actually need an objective analysis of both options before we can decide whether or not this is worth doing. Would that be a fair— I know the predisposition is that it seems like a worthwhile project and we should push ahead but would that be a fair enough comment?

Mr MONTICONE: I can only say that I am not aware of any cost benefit analysis that may have been done. It could have been done—I am just not aware of it.

Mr GOWING: Can I just jump in and try and be more positive? Work should be done. There are definitely areas to make better use of water, by recycling areas available in letting less water to the environment and in its natural state, the rivers went dry up here before there were any dams it used to go dry and the environment would recover. There are options of possibly bringing water over the range. There are a whole lot of options that could be examined. I believe that we should not be holding the area back. We should be looking at these things and seeing what possibilities are available and if they are proven to be sustainable, moving forward for the good of Australia and the good of the area.

The Hon. MARK BUTTIGIEG: So notwithstanding how good those alternatives may be—technology, efficiency saving methods—it is the submission of the group that this should go ahead regardless.

Mr RICHARDS: I think also what we are really saying is that it is not one or the other, it is really both. We look at what happened in the last couple of years and fundamentally it would not have mattered what technologies you had to save water, Tamworth council would have struggled with a supply issue. That does not mean that there is not a really sound argument to continue to find ways to manage their water more effectively. I think a pipeline from Chaffey to Dungowan and then upgrading the pipeline from Dungowan to Tamworth is a wonderful idea.

I think looking at recycling in the waste water treatment area of Tamworth is another wonderful idea. There are lots of ways that they can make marginal improvements in their water usage. At the moment Tamworth was facing situations last year where people were only able to put a bucket in the shower and take that outside to water the garden. To me, that is a fundamental supply issue. They need to be able to access better water supply and I do not think technology is going to do that.

The Hon. MARK PEARSON: Just a broad question to end with. We have had considerable evidence put before us that this is probably not the best way to go, to build dams to try to resolve this problem. Of course, that is one of the reasons why this Committee was established and we have this inquiry, to grapple with those questions. They quote world's best practice; a lot of research has gone into this. The question that will always be there that we have to grapple with is how we got ourselves into this situation. We have established these towns, such as Tamworth, and we have come into a crisis with sourcing water for them. The notion or the project of building dams is seriously in question as well, as to whether this mechanism is actually the answer, and whether we should not be really looking at all the factors that have actually brought us to this point of there being a serious water-source issue. They talk about environmental concerns, and that really we need to be a bit more visionary as to how we are going to tackle this problem, rather than just storing more water that is not actually giving us more water. Do any of you have any comments on that evidence that we are having to consider?

Mr MONTICONE: I think there is a current problem. The current problem is that if we do nothing Tamworth is at risk of running out of water regardless of any population growth. Somebody has to do something, otherwise there will inevitably be a problem. I cannot tell you what year, but there will be a problem. There will simply be insufficient water for Tamworth council, regardless of any other stakeholders. Something has to be done. It is a question of what can be done quickly. Maybe it is only a temporary stopgap, but something has to be done. It is all very well to look at world's best practice and everything else, but Tamworth is in a completely different climatic zone from the coast of New South Wales, a completely different climatic zone from places in Europe. I think what is required here is a local solution to a local problem. Thank you.

The Hon. MARK PEARSON: Mr Richards or Mr Gowing? We have two minutes left—a minute each.

Mr GOWING: I will have to come in and say we have to look forward. The future Australia depends on water. Okay, building dams, as suggested by Mr Monticone, may be a stopgap method. But we need to keep our population—Australia's population is increasing. We need to keep the prosperity of Australia, so we need to build dams. We need to look at whatever other method of supplying water or re-using water is available to us. If we do not do that, the country will go backwards. If the country does not go backwards, the environment will not be looked after, at the end of the day. We have just got to move forward. I see building dams as probably the most immediate stopgap measure, but in the long term we have to look at more measures—it may be bringing water over the range, as I said earlier. I am not going to try and give you the solution to that, but Australia as a country needs to move forward. If we do not do that, we sign our death warrant.

The Hon. MARK PEARSON: Mr Richards, you would like to have the final statement?

Mr RICHARDS: I think my two cohorts have summed up my views as well—that is, I do not think that there is one silver bullet for water supply within Australia. But I do think that the more we concentrate on trying to provide solutions that are suitable in each of the different areas, the more likely we are to come up with things that work. In Tamworth's particular case, we do not have things like a desalination plant as an option. We

do not necessarily have being able to recharge the groundwater aquifer as an option, because I do not think it is quite big enough.

Our options are limited to a couple of those which involve trying to do more with the water that we have got, stopping the losses in transmission from the source to the site, and to perhaps try and increase the storage of water in the high reaches of the valley so that we can spread that water consumption and that water flow over the longer term and supply water for the region and Tamworth irrigators along the way. In summary, I just think that is the case of every area: We have to find a local solution. In this area, I think the local solution increasingly looks like accessing more water supply through building another dam, with the other option of accessing other dams seeming to have fallen by the wayside.

The Hon. MARK PEARSON: Thank you very much everybody for your evidence. It has been extremely helpful for our deliberations. I do not anybody has taken a question on notice so I do not need to go to that question. We will now close this particular episode of the inquiry.

(The witnesses withdrew.)

The Committee adjourned at 15:46.