

REPORT OF PROCEEDINGS BEFORE

STANDING COMMITTEE ON STATE DEVELOPMENT

**INQUIRY INTO THE ADEQUACY OF WATER STORAGES IN NEW
SOUTH WALES**

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At Sydney on Friday 3 May 2013

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The Committee met at 9.30 a.m.

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PRESENT

The Hon. R. H. Colless (Chair)

The Hon. P. Green

The Hon. Dr P. R. Phelps

The Hon. M. S. Veitch (Deputy Chair)

CHAIR: Welcome to the fifth and final hearing of the State Development Committee's inquiry into the adequacy of water storages in New South Wales. Before I commence, I acknowledge the Gadigal clan of the Eora nation and its elders and thank them for their custodianship of this land. I would also like to pay respect to the elders, past and present, of the Eora nation and extend that respect to other Aboriginal peoples present.

The inquiry's terms of reference require the Committee to inquire into and report on a range of issues, including the capacity of existing water storages and models for determining water requirements for agricultural, urban, industrial and environmental needs. The inquiry will also examine proposals for the construction and/or augmentation of water storages in New South Wales. Today we will be hearing from Mr David Harriss, Commissioner of NSW Office of Water, who is returning to give further evidence, and from Mr Ron Pike and Mr John Ibbotson.

Before we commence I would like to make some comments about certain aspects of the hearing. For any media present, the Committee has previously resolved to authorise the media to broadcast sound and video excerpts of its public proceedings. Copies of guidelines governing broadcast of the proceedings are available from the Committee staff. In accordance with the guidelines, a member of the Committee and witnesses may be filmed or recorded; however, people in the public gallery should not be the primary focus of any filming or photographs. In reporting the proceedings of this Committee the media must take responsibility for what they publish or what interpretation is placed on anything that is said before the Committee.

DAVID ANDREW HARRISS, Commissioner, NSW Office of Water, Department of Primary Industries, on former oath:

CHAIR: Thank you for coming along again to this inquiry. Would you like to start by making a short opening statement or will we get straight into questions?

Mr HARRISS: I am quite happy to go straight into questions.

CHAIR: During your previous appearance here the comment was made that there was no allowance made for environmental flows when existing storages were constructed. Can you confirm that and just explain to the Committee how then you manage the issue of environmental flows when those dams that were constructed did not have any propensity for environmental flows contained in them?

Mr HARRISS: A point of clarification: The dams were constructed particularly within inland New South Wales for water storage and conservation. The environmental flow component would have been the base flows that would have been released to keep the rivers flowing at most times, but there was no specific allowance for environmental water allocations or for environmental flows to be deliberately released from those water storages at the time they were built.

The Hon. Dr PETER PHELPS: When you say "base flows", what sort of percentages of pre-dam flow would we be looking at?

Mr HARRISS: The only one I really know of off the top of my head is the Snowy, of course, which is 1 per cent at Jindabyne. But that actually puts additional water into the Murray Valley, which means the flow at Albury is higher than the original flows. That diminishes, of course, as you go further down the river and water is extracted. If you look at the Murrumbidgee, for example, there are rules now within the water sharing plan which allow for a minimum of 300 megalitres a day passing at Balranald, which has been changed, but that was the original minimum flow.

Similarly, in the Lower Darling we had flows during winter of 50 megalitres a day. That was just to keep the rivers ticking over, if you like, and to make allowance for stock and domestic extractions at all times of the year. But there were no specific provisions for allowing large volumes of environmental flows to be released from those storages.

CHAIR: So in the current situation with the Murray-Darling Basin Agreement that is being talked about or being implemented, the environmental flows that are required to be allocated to that system now are over and above what would have been planned for those base river flows, are they not?

Mr HARRISS: No. What we have done throughout our water sharing plans for recovery of water for the Snowy and recovery of environmental water is to recover from existing entitlements wherever possible or to make infrastructure arrangements or change operational arrangements, which reduce losses. So you are effectively releasing the same volumes of water but they are released for other purposes and they are now being released for environmental purposes.

The Hon. Dr PETER PHELPS: But that is not without cost, is it?

Mr HARRISS: It has come with quite substantial cost. In the recovery of water, infrastructure projects are quite expensive. Just by way of example: with the proposed works at Menindee, the Federal Labor Parliament in its election campaign in 2007 announced \$400 million to set aside to undertake those works. So that shows how seriously expensive infrastructure works can be. The recovery of water for the environment by the purchase or acquisition of entitlements comes at market price, and where the Commonwealth has been in the market, quite clearly there has been a premium paid for those entitlements to be recovered. So it is quite an expensive proposition recovering water.

The Hon. Dr PETER PHELPS: I suppose my more fundamental question is: Is it worth spending literally hundreds of millions of dollars to keep Lake Alexandrina looking pretty?

Mr HARRISS: That has been a decision for the Commonwealth Government. New South Wales has made submissions on that. We believe that the environmental outcomes should be very objective in terms of recovering water both within valleys and the system flows. But I think what has become an issue is that it is one thing to keep the lake levels of the lower lakes constant and reduce the incidence of acidification or high salinity, but quite clearly to get the volumes that were required for the lower reach of the river were quite aspirational and cannot be reached during periods of regulated flow; it would have to be by putting releases on top of and over and above probably flood flows or high river flows in one or more of the tributaries.

CHAIR: You mentioned that a lot of these environmental flows are being acquired from other use water—essentially, irrigation water, the purchase of irrigation entitlements. Do you think that it is appropriate that we should be looking at extra storage capacity in the system to allow for those environmental flows without having such an impact on productive agriculture?

Mr HARRISS: As I said before, we have tried to minimise the impact on agriculture by suggesting that the—

CHAIR: But it has still been quite substantial has it not? The fact that you are taking so much water off productive agriculture has had an impact on towns and economies.

Mr HARRISS: We believe so, and that has been a fundamental component of the New South Wales submission on the Murray Darling Basin Plan, that we did not want to see water taken out of production, not necessarily because it will have an impact on irrigators per se—in fact, any irrigator could sell their water, retire their debt and go to the Gold Coast—but what our concern was for New South Wales was the impact on secondary industries that depend on that production, particularly in water-dependent economies. So we are trying to minimise that effect.

The question you asked though—is it worthwhile looking at investing in infrastructure improvements to provide additional capacity to release those environmental flows—that really is a question of balance: to say how are you going to deliver those environmental flows? Is it worth providing additional storage or providing additional storage and taking the flows away from one part of the year to another? Is it worth that investment? It is quite a complex question and it comes at quite a significant cost.

The Hon. Dr PETER PHELPS: But there is a more fundamental a priori question, is there not, and it is probably more for us to answer: Do we need the level of so-called environmental flows which are currently in place and being planned in the future for these systems in New South Wales or is it simply a case that, for want of a better word, green extremism has taken over to the point where commercial considerations, social considerations for life in inland New South Wales have gone by the wayside in pursuit of this fairly substantial goal of having large volumes of water essentially slide down the rivers for no good purpose?

Mr HARRISS: In New South Wales we went through a process of water reform from the mid nineties right through until now where we recognised that possibly the allocation of water for consumptive purposes had in certain circumstances gone beyond the capacity to keep the rivers themselves healthy and productive to the state where you could continue that economic productivity. Things like increasing the incidence of blue-green algae blooms, increasing salinity, needed to be addressed to maintain production throughout inland New South Wales. So we entered a process of water reform, which included the development of water sharing plans which provided water for the environment and community groups worked out what was necessary to maintain the health and productivity.

Another component of the water sharing plans was we introduced into the National Water Initiative for New South Wales what we called the Risk Assignment Framework, where at the end of each of the 10-year water sharing plans there could be a review of the rules of the pre-existing water sharing plans to see if they had maintained the health and productivity of the river, and we could then seek to recover further water for the environment. Again, it was to maintain the health and productivity of those river systems, not necessarily just an environmental or conservative outcome. But there was a limit: You could take back 3 per cent per decade from the baseline entitlements without compensation. We believe that was enough to follow the progress of recovering rivers to maintain their productivity but not at the expense of industries or regional communities. We believe that was the limit that communities could cope with and we negotiated that with stakeholders, including the NSW Irrigators' Council at the time.

The Hon. Dr PETER PHELPS: It does appear to be a one-way ratchet. Maybe you can help me. I am not aware of any instance where environmental flows have been reduced in that period of time.

Mr HARRISS: During the drought, the provisions within the water sharing plans for environmental flows were reduced.

The Hon. Dr PETER PHELPS: As an exigency measure but not for a long-term measure.

Mr HARRISS: Not for a long-term measure. Not at this stage, no. We are still in the process of water recovery. The point I am trying to make is New South Wales was in a process that had been agreed with industry groups to recover water for the environment to maintain the health and productivity of the river systems. Quite frankly, the basin plan came along and swamped the New South Wales approach. And, yes, there has been a significant investment of Commonwealth funds in the recovery of water, and New South Wales remains concerned that the volume of water taken out of production over such a short period of time will have adverse economic impacts on regional communities.

The Hon. MICK VEITCH: David, welcome back.

Mr HARRISS: Thank you.

The Hon. MICK VEITCH: As you are aware, we have travelled around the State. No doubt there have been a number of issues raised that you would appreciate the opportunity to address at some stage, or at least have the right of reply. I want to talk to you about the Tumut River. Since our site visit to the Tumut River, there have been a series of stakeholder meetings to discuss further increasing the releases for the Blowering Dam down the Tumut River, particularly around Mundarlo Bridge. Has your office been involved in those stakeholder consultations?

Mr HARRISS: We were observers as the Office of Water. This program is one of eight projects funded by the Commonwealth to undertake feasibility studies for contributing to the basin plan, whether it be looking at further water savings projects or restrictions to maximise the benefits of environmental flows. The inquiry into raising the Mundarlo Bridge at Gundagai was a project that was taken on by the Office of Environment and Heritage. They were responsible for running that program and, yes, they did have stakeholder meetings down the river, of which NSW Office of Water was not an active participant. We were certainly aware of it and my understanding is that we were present.

The Hon. MICK VEITCH: Are there any observations that you can convey to the Committee?

Mr HARRISS: There was a fair bit of negative press about that.

The Hon. Dr PETER PHELPS: I think that is a fairly accurate comment.

The Hon. MICK VEITCH: That is a fair comment.

Mr HARRISS: It goes back to the submission of the New South Wales Government to the basin plan that, in recovering water for the environment, there should be no compulsory acquisition, and there should be no compulsory acquisition of land to facilitate the passage of environmental flows. The third party impact should always be considered. We are sticking to that position.

CHAIR: What has been the Commonwealth's response to that?

Mr HARRISS: The Commonwealth's response has recognised that. It is a complex issue. It is undertaking trials at present. All of those trials of releases are within existing channel capacity constraints that the NSW Office of Water and the State Water Corporation would normally abide with. There is an issue of liability. My understanding is that the liability comes back to the operator of the infrastructure. We are very concerned then that if we are asked to deliver environmental flows that the State is not liable for any potential impacts and it should be the person requesting those flows.

The Hon. Dr PETER PHELPS: Where does liability lie?

Mr HARRISS: My privileged advice is that liability currently rests with the operator of the infrastructure.

The Hon. Dr PETER PHELPS: So you are stuck with the—

Mr HARRISS: Between ourselves and the State Water Corporation, but certainly the New South Wales Government would—

The Hon. Dr PETER PHELPS: For a Federal request.

Mr HARRISS: Bearing in mind the legal advice can change, as you know. We are very concerned that in the delivery of environmental flows well and truly over and above the levels that we currently deliver them that the liability is not borne by New South Wales.

The Hon. MICK VEITCH: I know you have had a chance to read the transcripts. It would be fair to say that the Dams Safety Committee has come under criticism in our travels. I will give you the example of Copeton Dam. Tens of millions of dollars has been spent to make that dam safe in a one in one million-year flood event. It has been put to us that that \$60 million-odd could have been better spent for water savings and things such as that rather than being spent on the dam. What involvement does your office have with the Dams Safety Committee and implementation of its recommendations?

Mr HARRISS: The Dams Safety Committee actually reports through the NSW Office of Water to the Minister, but mostly for administrative purposes. However, on reasonably significant issues we have a lot of interaction with the Dams Safety Committee. For example, currently we are doing reparation work at a dam near Mudgee where we have worked co-operatively with a lot of stakeholders and the Dams Safety Committee to bring it up to contemporary standards where it is no longer a threat. We are familiar with the Dams Safety Committee's risk procedures that they now apply to determining dam safety requirements, but we recognise that Australia, particularly New South Wales, is proud of running the most secure dam safety provisions anywhere.

I recognise the point that you are making: what degree of safety is required? The Dams Safety Committee now applies a risk strategy process but does not compromise public safety at all. Currently we are having a review of the legislation that applies to the Dams Safety Committee and we are having a review of the operations of the Dams Safety Committee. Consistent with the point you are trying to raise is that you can have that level of security, but you do not go for that in absence of saying, "Well, is the investment of \$100 million here more important there, or should we be investing it in health, or education, or water recovery?" So we are having a review to say—and I am paraphrasing—what is the best risk management strategy that can be applied so as not to compromise the most contemporary dam safety standards, but to recognise that there are a lot of competing interests for limited resources, and that any decision to upgrade dam safety to a certain level should be undertaken in consideration of some of the other demands on those resources.

The Hon. MICK VEITCH: What is the timetable for that review?

Mr HARRISS: It is currently being undertaken. I do not know what the timetable is.

The Hon. MICK VEITCH: Can you take that on notice?

Mr HARRISS: I will take that on notice.

The Hon. MICK VEITCH: It would be fair to say that most communities that we have visited are not happy about the Dams Safety Committee's processes. There is a serious lack of understanding about how the Dams Safety Committee operates. I do not think we found anyone anywhere who supports what it is doing.

The Hon. Dr PETER PHELPS: The argument put forward was basically it is a bunch of engineers who are seeking to re-engineer to an over-engineered standard. Considering that China is the longest known civilisation that we have a record for—some 6,000 years—to have a dam safety requirement of one in 100,000 or one in a million years is probably a little over-engineered.

Mr HARRISS: If you look at it in terms of absolutes, it goes without saying. What the Dams Safety Committee is now applying is a risk-based approach: what is an appropriate contemporary standard for dam

safety so as you do not compromise public health, but so that you can make decisions in respect of the available resources and the competing demands for those available resources.

The Hon. Dr PETER PHELPS: The trouble is the argument then leaves a whole lot of dams nominally on the books as being risky with no definitions as to what the risk entails. A risk of one in ten years is quite substantially different from a risk of one in 100,000 years. The dams are still the same but the optics are very bad if you have 20 dams that are nominally listed as risky without a clear definition that the risk means one in a million years.

Mr HARRISS: I understand. What is apparent is the need for the standards for the Dams Safety Committee to be adequately defined. As I said, it is now taking a risk-based approach rather than absolute.

The Hon. MICK VEITCH: Criticism of the Integrated Quantity and Quality Model [IQQM] has also come up in our travels and how river system behaviours are simulated. Does your office use any other model?

Mr HARRISS: Yes, we do. The Integrated Quantity and Quality Model was developed by the Office of Water. It was most contemporary at the time. We in fact sold that model into the Mekong Valley. We have previously sold it into Queensland, and it was the IQQM that formed the basis of the CSIRO models that are being used now. We have moved on in some areas, but basically we use the IQQM model. Other States use different models, but nationally we are also looking at going to a national modelling platform, which is currently being developed by eWater

The Hon. MICK VEITCH: You have obviously read the Committee transcripts. Do you think the criticisms are valid or is it more a misunderstanding of how it is utilised and applied?

Mr HARRISS: We are always challenged on our models because models are numeric models and if you change an algorithm within a model you get a completely different answer. It is almost like unless you can work through that model with a pencil and paper people will not have absolute confidence. What we have tried to give is confidence over the 20 to 25 years that we have been using that to say that this is the best model we have got and we recognise that it is only a model, but we do use those for planning and operational purposes. But there is always talk about moving to more contemporary models. State Water are currently investigating or looking at a model called CARM, Computer Assisted River Management. We always look at better contemporary standards and upgrading our models to include a better description of how the river is operated. But at the end of the day they are numeric models that make representations of the system. I think it is fair to say that in the Office of Water we tend to use them as a supporting mechanism and have them supporting us and not us supporting the model so much. We do not want the modelling to be wagging the dog.

CHAIR: Have you done any comparison between the IQQM and the CARM models applied to the same section of river?

Mr HARRISS: No, we have not done that. CARM is being trialled in the Murrumbidgee Valley, and that was being undertaken by Water for Rivers together with State Water. Our hydrologists and our modellers have been very close to that and we are looking at that. Currently State Water is investigating how best to use CARM, how best to simulate river management and see if we can generate water savings as a consequence. The Office of Water modellers and hydrologists are very closely associated with that so that we can determine whether there are in fact water savings that can be realised for the basin plan so we do not have to bridge the gap by water purchase any further and just, by the very nature, running the rivers better.

The Hon. MICK VEITCH: What are the initial responses to CARM? I know that it is in its very early stages.

Mr HARRISS: The Office of Water's response is, "Can you prepare a business case which goes into sufficient detail to enable us to make the analysis?"

The Hon. MICK VEITCH: Because in the Northern Rivers there was reticence—

The Hon. Dr PETER PHELPS: Scepticism, I would say.

The Hon. MICK VEITCH: Yes, scepticism about CARM.

Mr HARRISS: I think there is scepticism about all models because it is almost like you put in the numbers and out comes the number and unless you can prosecute that back to how it affects you there is always going to be some sort of challenge. But they are just numeric models and they are a very good tool for assisting in planning and operating.

The Hon. Dr PETER PHELPS: I think their argument was more based on the fact that the regularity of flow down the Murrumbidgee made CARM a more applicable model than what they had in the Northern Rivers.

Mr HARRISS: My understanding is that State Water has trialled CARM in the Murrumbidgee and I think it is fair to say they have probably got more information regarding the Murrumbidgee. But it is incumbent on them to go out and look and effectively sell it, if you like, or to investigate it appropriately as to its applicability in the northern valleys.

The Hon. MICK VEITCH: Coming back to the criticisms of IQQM, clearly there is some work to be done to allay people's concerns about its use or implementation. What is your office doing to address those issues?

Mr HARRISS: On many occasions we have made information about the modelling available to those stakeholder groups who have provided that criticism. At the same time we still use it and it is still a very valuable model. For example, in the southern valleys we are using our IQQM to forecast the minimum inflows to say what is going to be the starting allocations for general security in all those valleys based on our conservative approach. We use that model then to say if it is not the driest of inflow sequence, say it is in the 30 per cent tercile or the next tercile, we can provide users with information that if it is a bit wetter than average, this is how much water you are going to get. If it is a bit drier than average, this is how much water you are going to get. In the worst drought sequence we have had so far in 120 years, this is the amount of water you are going to get.

Progressively over the last couple of decades we are providing more and more information to users to enable them to make business decisions. That is not for us to forecast how much water is going to be available by the end of the year but to give the users an appreciation of under different circumstances how much water is likely to become available. Then they can make their appropriate business decisions. Whether they carry over water, whether they sell water, whether they use water, how much land they plant for a particular crop, they can make that as a business decision. I think that is fundamental. We use that modelling information and the information that the Office of Water provides to users so that they can make their own business decisions.

The Hon. PAUL GREEN: I will pick up on what the Hon. Peter Phelps was talking about—that is, the over-engineering from the Dams Safety Committee recommendations and how dams are designed. For example, it cost \$80 million to build the safety trigger point at Copeton Dam. We asked about that when we were out in the field. People did not say that it was not needed for the sake of safety and risk management, but many stakeholders felt that they would have used that money differently in terms of productive land uses and probably for better outcomes. I note you have made the comment about it being a lot of resource, where do you put it and that you are short on resource. But I also note the point some people made that it was a lot of money and it could have been far better used to distribute water resources throughout the communities. Do you have a comment on that?

Mr HARRISS: Firstly, the issue of the investment in dam safety is separate to having that water available for water for production or whatever. The issue is you have got to make that investment based on that risk assessment approach. The review of the Dam Safety Committee's legislation will hopefully articulate that and how we have moved from an absolute to that risk-based approach. Is the issue more about if you upgrade a dam where is the water? Is that what we are getting to?

The Hon. Dr PETER PHELPS: One of the things that was put to us was that you could retire a lot of inefficient on-farm water storage if you could build deeper and more efficient on-farm storages, which of course is a capital cost, and that for the cost of the upgrade to Copeton you could have built sufficient on-farm water storages to have made massive savings to water.

Mr HARRISS: I now understand what you are getting at. There are two arguments to that. One is would it be better to have a whole lot of on-farm storages separately around a whole lot of properties or is it better invest in one major public-owned capital bit of infrastructure.

The Hon. Dr PETER PHELPS: No, there is no argument on that. They do like that. In fact, they like the idea of more dams so that they can have water on demand and not need on-farm storage. The argument was that we will still need some on-farm storage. If we had one efficient one and three inefficient ones it would be better to retire the efficient ones and make the efficient one even deeper. In the normal course of events you could have water on demand and you would have the minimum required for on-farm storage. The argument was that that would be a better arrangement.

Mr HARRISS: At the moment people can do that. We assess that, if it is private investment, based on the normal environmental considerations plus operating within the current constraints we have got. Those constraints are plan limits on diversions from rivers within New South Wales, the Murray-Darling Basin cap on diversions, which is through the basin, and what are the proposed sustainable diversion limits under the plan.

The Hon. PAUL GREEN: My point is that you potentially have an over-engineered construction that perhaps could have cost less and the money saved could have gone into other areas of water usage. A one in one million flood is just crazy, in my view. It is a crazy summation based on statistical data.

Mr HARRISS: We are reviewing the Dam Safety Committee and they have moved to a risk-based approach rather than an absolute. I think it is probably important that that be articulated a bit more. But I take your point. One of the reasons that prompted the review of the Dam Safety Committee was for that investment are there better outcomes for the community general, but not just in different ways of managing water.

The Hon. PAUL GREEN: Staying with the Copeton Dam, we noted that back when they built these dams there was no allocation for extra environmental issues. I think about 20 per cent of the water is allocated to those things now, but the dam was never built for that. The dam was built for production purposes and for the environmental flows that keep that going. It was not built to have 20 per cent of its capacity allocated to environmental issues.

Mr HARRISS: No. Clearly those dams in inland New South Wales were constructed for water storage and conservation. Whilst they provide base flows, which provide some base environmental outcomes—and we have to be able to provide for stock and domestic use—similarly they were not built for flood mitigation. They are subsequent benefits, but they certainly were not built for flood mitigation. We have had to consider changing the releases from the dams to provide for the health and productivity of the river and the environmental outcomes that are now sought. They certainly were not built to provide that level of environmental flows. They were built to provide flows but mainly for consumptive purposes. All we are doing is changing the purpose of the release of those flows.

CHAIR: When you are releasing water from Copeton Dam for irrigation that doubles as an environmental flow. We are talking about large amounts of allocated water going through the system into the—

Mr HARRISS: Releasing water from any dam during the peak of summer when the flow would naturally have been low is not providing an environmental outcome. It is probably contrary; it is providing high flows at the wrong time of year. When you release the water you do it when it is suitable for Australia's native environment. The flows should coincide with what would have been a high flow period. In the south of the State that is typically in August, September and October and in the north of the State it might be more summer orientated. Obviously irrigators need the water delivered when it is hot and dry, which is typically not when the natural environment gets those flows. The whole point of dams is not to create water but to regulate the time and volume of releases.

The Hon. PAUL GREEN: It would appear that there is not enough water to go around. However, there is because life goes on and we make do. Many participants in this inquiry have proposed the construction of new water storages. You have probably read the evidence that has been presented to the inquiry. Do you have any comments about new water storages and perhaps bringing us into the twenty-first century with purpose-driven dams given that we have taken those other issues on board and changed the way we allocate water?

Mr HARRISS: I refer back to my submission. We have picked the ideal locations throughout New South Wales for storage—we have picked the low hanging fruit. They are quite expensive to build and to operate and maintain. The question for government is whether that expense will deliver a true cost benefit. Our argument has been that we should look at maximising the benefits provided by the existing infrastructure and augmenting existing infrastructure before we build new infrastructure. One of the arguments I put in the original

submission related to the millennium drought. The dams in inland New South Wales filled and spilled in 2000 and the next time that happened was 2010. That meant the existing storages captured every bit of inflow during those 10 years. A new piece of infrastructure would have been of no value or consequence because it would not have captured any further inflows. That meant we would have invested the capital cost and the ongoing operations and maintenance costs of that infrastructure with no perceivable gain.

The Hon. Dr PETER PHELPS: Presumably the only viable funding model for a large-scale storage would be 100 per cent government funding. Are you aware of any public-private partnership option available for the construction of a new dam?

Mr HARRISS: I am not aware of any specific public-private partnership. However, I do know that the National Water Initiative requires that cost of water management be borne by the users and that users should pay wherever possible. Where that is not possible, cross-subsidisation from other sectors should be transparent. In our view that effectively means that the beneficiaries—that is largely the water users—should bear the costs, particularly of the operation and maintenance of that infrastructure, and that can be quite substantial.

The Hon. Dr PETER PHELPS: But the capital cost would have to be provided entirely by government.

Mr HARRISS: It does not have to be, but I am not aware of any public-private partnership.

CHAIR: Can you explain the arrangements with the Pindari Dam augmentation? That was privately assisted if not funded, was it not?

Mr HARRISS: I will take that question on notice. That is an issue for State Water. I do not know the answer off the top of my head.

The Hon. Dr PETER PHELPS: Has Water for Rivers ended or is it ending?

Mr HARRISS: I believe it has ended.

The Hon. Dr PETER PHELPS: What has happened to the personnel and the knowledge base built up during that process? Has it been incorporated into any State entity?

Mr HARRISS: I stand to be corrected, but I believe that a number of the people working for Water for Rivers are or will be employed by State Water. They are particularly looking at the benefits that CALM might provide to the operations of State Water.

The Hon. Dr PETER PHELPS: I am thinking more of the capital infrastructure and skills that Water for Rivers developed through those sorts of initiatives.

Mr HARRISS: Water for Rivers did not have a lot of those skills in house—they were contracted in. It was a small organisation that did a lot of outsourcing.

The Hon. Dr PETER PHELPS: You mentioned investment in efficiency and existing infrastructure. Do you have a comprehensive plan for the State for the improvement of the existing infrastructure?

Mr HARRISS: No, not for the infrastructure. Again that is the domain of State Water—it is the infrastructure manager. We are looking at operational benefits that can be gained. We do have issues. For example, the Office of Water is responsible for working out the best release patterns for the Menindee Lakes. We have investigated potential efficiency options at the lakes for probably up to 20 years. We are finally getting a bit of traction with the Commonwealth in regard to funding some of those efficiency improvements.

The Hon. Dr PETER PHELPS: Does that include new regulators?

Mr HARRISS: Yes. Extensive investigations have been undertaken. Some of that involved the Darling Rivers Studies, which are on our website. The most recent part B study identified six options for the best management. The baseline option was to retire two of the larger lakes in the system. That established the bottom line from our perspective. It was never going to happen, but it was a point against which we could base our analysis of other options. The Commonwealth preferred that option because it was simply effectively

decommissioning two of the lakes. The New South Wales Office of Water did not agree with that option because we believed it reduced the reliability of water supply to downstream users. It also compromised the environmental values of the Menindee Lakes themselves, which in their own right are large economic drawcards for that part of the world.

CHAIR: Which lakes were to be decommissioned?

Mr HARRISS: Menindee and Cawndilla—the two lower lakes. The water would be held in the upper lakes for a long period and the rest of the water would just pass through the lakes. New South Wales did not agree with that because it reduced reliability of supply to downstream users, particularly in dry sequences. It is alright to say there would be no average reduction, but we do not work on averages in the Office of Water. It would have compromised the environmental values of the lakes themselves, which again come with economic and social benefits. It would also have required an alternative water supply for Broken Hill.

The Hon. Dr PETER PHELPS: It draws from Menindee.

Mr HARRISS: That is correct. What was proposed by the Commonwealth, which was managed aquifer recharge, was, we believe, prohibitively expensive and not acceptable to the community. We are now looking at preferred options by New South Wales, which is option six in the Darling Rivers Part B study. It includes a regulated block bank between Lake Menindee and Cawndilla. During any dry period, you get smaller inflows. It is not all or nothing. But those small inflows then would be stored in Lake Menindee and the two upper lakes, and not be spread out across Lake Cawndilla, so you would reduce the evaporation savings there. We would also propose that we would enlarge the outlet capacity of Lake Menindee, or put in another regulator. That would mean that you would draw harder on that lake as well, again reducing the surface area and reducing evaporation. They are the two major points of infrastructure. Then you would change the operations to keep the smaller inflows in the upstream lakes without reducing the reliability to downstream use to users.

CHAIR: Does that include an outlet regulator on Cawndilla as well?

Mr HARRISS: No. We have found through our modelling and through our investigations that that is not necessarily required to increase resources. The water would be used from Cawndilla to meet the demands of Tandou downstream, as it does now, or to meet some of the natural flows, which are now offset, in the great anabranch. The modelling shows that you do not get much of a benefit by doing that. The really issue, Chair, is that if you keep the water in the upstream lakes, you have more flexibility.

CHAIR: Correct.

Mr HARRISS: That is what we are proposing. We can then change some of the triggers that we have in Menindee lakes to allow water to go back into the control of the Commonwealth at different stages, but again without reducing the reliability of supply to New South Wales and other users. As a matter of fact yesterday I met with the Commonwealth, who suggested they want to start more seriously the investigations that are required. Bear in mind that the lakes were surcharged last year. We have drawn down quickly, but they have had inflows come into them now. The best time to do works is when the lakes are dry, and that will not be for a couple of years yet, so we have some time in which to do those investigations.

The Hon. Dr PETER PHELPS: Do you have any role in the possible decommissioning of the dams that are currently located at Toorale Station?

Mr HARRISS: No. That is really an issue between the Office of Environment and Heritage and the Commonwealth department because it was part of the arrangements for the purchase of Toorale Station.

The Hon. MICK VEITCH: We know from our merry travels around the State that there has been a lot of comment around whether there is a flood mitigation role for our water storages. I want to give you an opportunity to respond to some of the comments and suggestions around whether those capacities or those facilities do have a role in mitigating floodwaters, or how we better release water at times of significant flow.

Mr HARRISS: Getting back to the original point, they were not built for flood mitigation.

The Hon. MICK VEITCH: I know.

Mr HARRISS: But if any dam is there and has any capacity, it will provide some form of flood mitigation capacity just by its very nature; it fills up. Even if a dam is full, it can attenuate the flows to a certain degree, so by default they provide some flood mitigation. Two of the lakes in inland New South Wales at Burrendong can be surcharged to 160 per cent. Similarly, the Menindee lakes can be surcharged to 118 per cent, but they have pretty stringent rules about getting them down to full operating supply levels thereafter. All lakes provide some flood mitigation capacity. The dams are operated with some capacity for flood mitigation, depending on the time of the season. State Water, the Murray-Darling Basin Authority and ourselves keep a very close eye on weather forecasts to adjust releases, particularly over an eight-day period.

But it is another thing to move it to a broader time horizon and say something like, "We should be providing 20, 30 or 40 per cent capacity for any storage to provide for flood mitigation." The way that the New South Wales Office of Water and most water managers work is that tomorrow is the start of the next drought in Australia. We are subject to extremes in dry conditions. Those dams were built for water conservation purposes. I think it is important to maintain the integrity of that initial purpose.

The Hon. MICK VEITCH: This next question flows from that question and from stakeholder consultations that I spoke about a bit earlier in relation to the Tumut River. How do we engage stakeholders in the development of strategies to assist in balancing those competing demands of our water systems? Our inspection at Wagga Wagga is a pretty fair example. The people in the upper system in Tumut have some real issues about riverbanks. I think they said that their river had been turned into essentially an irrigation canal. Then downstream, there was no sympathy for the people of Tumut at all, really.

The Hon. Dr PETER PHELPS: No, there was not.

The Hon. MICK VEITCH: For that river system, I am interested in how we engage the full system and how we engage stakeholders on all sides about managing what is everyone's river system, essentially, and how we ensure that everyone understands what we are doing.

Mr HARRISS: There are a number of different ways in which we engage the communities throughout the length of the system. In the development of water-sharing plans, previously we had river committees, or committees that were put together that were representative of all different parts of the river and were representative of different industry and stakeholder groups as well. They came together and I think it is fair to say that the development of water-sharing plans and the development of water management is all about providing the most appropriate balance; and everyone's idea of balance will differ, of course, depending on their own interests.

We have got the broad over-arching committees that develop those water-sharing plans, but when we have different committees again—for example, State Water runs its customer service committee, which is largely focused on regulated river users. We consider their ideas and, in relation to the Tumut River which is your example, we have a Tumut River Advisory Committee and we consider some of their concerns. That is largely to do with the erosion that is occurring as a consequence of running the river—effectively, in the summer months—at constant levels to meet downstream demand. We have turned our river systems away from natural systems into providing good social and economic benefits. Getting back to my original point, it is a matter of trying to make sure those releases provide for those economic and social benefits but at the same time do not diminish their continuing health and productivity and capacity to support that.

The Hon. Dr PETER PHELPS: Can I just take up that point? One of the things that I have been hearing, not necessarily through travels but just otherwise, is that there is a perception among the farming community that catchment management authorities [CMAs] are becoming more and more concerned about environmental flows and less and less about the productive use of water. Would you say that in your experience that is a valid assessment?

Mr HARRISS: No, I do not think that is necessarily valid. I think the perception would exist because the catchment management authorities have long asked to be part of the determination of environmental flows, not necessarily the recovery of water. If you have environmental water allowances in any particular valley, they want to be part of providing advice on how best that is used. In fact, it has been a Cabinet decision that environmental water advisory groups throughout New South Wales will be chaired by the catchment management authorities. While they chair that environmental water advisory group, they are not necessarily an active participant in the customer service of committees, which are managed by State Water. There is probably a perception that they are only actually involved in environmental water management, but I do not think that that,

by any stretch of the imagination, is intended to suggest that they are advocates for environmental water management only.

The Hon. MICK VEITCH: Let us go to the stakeholder engagement and involvement. How do we do that better? Is there something that this Committee can recommend to strengthen or improve the process?

Mr HARRISS: I actually do not think there is a magic bullet. The Office of Water goes to extraordinary lengths to try to service whatever committees are available, including issues like the Lower Darling Water Users Association which meets once a year in August. We inevitably go out and try to meet that group just so that they are in touch with the broader policy changes that we are going through. We try to go to every customer service committee meeting, which is maintained by State Water. We regularly brief catchment management authority chairs. We operate through the Land and Water Advisory Panel, which is meeting today and which also brings in key stakeholder groups. We try to provide service to all industry groups and all stakeholder groups and all groups based on regions. It is an enormous demand, but we try to keep it up as best we can.

We also are putting more and more emphasis on getting information through websites and through electronic devices. For example, we have just gone through another high inflow period in the Menindee lakes. We have been putting out information sheets about the flows every two weeks during drought. We are putting out information sheets about what happens there. It goes from online access, sending out to email addresses, people accessing our website. We even still put up those hard copies on the notice board in pubs in some rural areas. We try to get that message out as much as we can. It is a continual improvement. We just try to get that message out to as many people as possible.

Can I give another example which is probably out of left field? There is a lot of talk about the significance of coal seam gas on water—you have probably got that on your tours around the State. We got the message that there is a lack of information. In the past three weeks we have put out six information sheets on our website: What is coal seam gas? How is it mined? What are the monitoring and reporting requirements? We are not advocating coal seam gas, we are not criticising coal seam gas, we just give them the facts, get into the debate by all means, but please be pretty well informed. Unfortunately, with things like coal seam gas and water management there is a lot of perceptions involved as opposed to focussing on the facts. It is a real challenge for any water management agency to make sure those facts are in the public domain.

The Hon. MICK VEITCH: With regard to release during times of heavy flows, say flood events, what sort of downstream warning systems are used? I ask that because it has been put to me in one of the river systems that they would appreciate, downstream farmers in particular, a system similar to what the Rural Fire Service uses with mobile phone notification, the get ready stuff. Maybe something like that could be used in a particular river system. Do you use that?

Mr HARRISS: My understanding is that State Water has implemented those systems, certainly in the Murrumbidgee, I think in the Murray, but you might ask State Water if they have, or intend to implement those systems. I think it is a great system but it is one of many systems that we can apply.

The Hon. MICK VEITCH: That is one of the criticisms, that is, the lack of time frame and warning of a release when the river system is already fully charged.

Mr HARRISS: I think State Water is going to that. They have contemporary standards which I think are fantastic and we should be moving towards them. Everyone has got access to gauge heights and things like that through our website. Occasionally in previous floods they have collapsed because of their use. In the Murrumbidgee we knew that one gauging station got taken out by a landslide. There is not a lot we can do about that.

The Hon. MICK VEITCH: That is downstream of the Burrinjuck.

Mr HARRISS: Burrinjuck, yes. We are always trying to review the systems we have got and make them as appropriate as possible.

The Hon. Dr PETER PHELPS: It would be remiss of me not to bring up some arguments raised by Dr Stuart Khan, a sparring partner, and his suggestions in relation to the use of existing reservoirs for flood mitigation. Is there a capacity within this State to have a wide-ranging flood mitigation capacity for dams

working in conjunction with a recycling potable standard system? Is it economically viable for that type of arrangement to be in place?

Mr HARRISS: I am having difficulty. How do you link flood mitigation with re-use of potable water?

The Hon. Dr PETER PHELPS: You would have a situation where if you lowered the capacity of Warragamba Dam by 30 per cent for flood mitigation purposes and then, were you to need it, you would have either desalination or recyclable water options feeding directly into Warragamba to maintain, if you like, a base level, but with that 30 per cent capacity above and beyond. Is that economically viable?

Mr HARRISS: I would have thought, off the top of my head, without looking at any analysis that would be very difficult to achieve economically. The Office of Water is currently investigating flood issues around the Hawkesbury-Nepean. You would be aware of the proposal to actually increase the level of Warragamba Dam. We want again to make sure that that debate is fully informed. We know that the floods in that area are not just caused by inflows to Warragamba Dam, the floods in the Hawkesbury-Nepean can be a consequence of tributary inflow downstream from about three major tributaries. The issue of the use of potable water supply, a sort of recycled water supply whether it be grey water or black water, into the water distribution system is a significantly contentious issue, and issue for government.

The Hon. Dr PETER PHELPS: If it is contentious and of limited economic value in a market such as Sydney then it would be probably be even more contentious and less economically viable in some of the smaller catchments out in central western New South Wales?

Mr HARRISS: I agree.

CHAIR: If we look at the amount of urban water that is used along the east coast of New South Wales, for example, Sydney has a outfall every year of somewhere between 450 and 500 giga litres, surely that water has a value that we cannot step away from forever?

Mr HARRISS: Absolutely, and I think we are on the road to looking at every possible economic way to better use water and recycling water where possible. It has got to be balanced by being economic. We are still dependent largely in Australia, particularly outside the metropolitan areas, on rainfall, and the capture of rainfall, and we have got the dams in those areas where it is most dependent. For example, on the North Coast there is very little catchment for big dams so we have only got dams on the coastal areas outside of the Hunter and Sydney, at Bega on the Brogo River and at Iron Pot Creek at Toonumbar Dam and the Richmond River catchment.

The Hon. Dr PETER PHELPS: I think someone once suggested there might be an upper Clarence scheme which could be built?

Mr HARRISS: Clarence Dam has been investigated for quite some time. My first understanding of the Clarence was a report that was produced in 1979 for the purpose of inland diversions. It demonstrated even then that it would be uneconomic and probably have severe environment consequences to divert it, and it would be very difficult to recover the costs of the infrastructure. The physics of the construction of a dam in the Clarence would be: to have sufficient water storage you would need to have the dam located at the bottom of your catchment.

The Hon. Dr PETER PHELPS: You would need multiple dams, would you?

Mr HARRISS: Multiple dams but they would be down at the bottom end of the catchment. Then to get it back to inland catchment you either have to pump it up higher or drill a long way through which makes it, even in 1979, very doubtful economically.

CHAIR: Is it fair to say that since 1979 the water pricing structures and the environmental flow requirements, et cetera, are vastly different now? Surely the day will come when the price of water will dictate—not necessarily diverting the Clarence—that recycling urbanised water and then looking putting it back over the mountain for agricultural purposes that it must become a reality?

Mr HARRISS: I do not know about if it is going over the mountains for agricultural purposes but I certainly think that recycling water for domestic purposes and industrial use within the major metropolitan areas is going to be a thing of the future, without a doubt.

The Hon. Dr PETER PHELPS: But you could also recycle water to a lower standard for agricultural purposes in western New South Wales?

Mr HARRISS: Yes, but it has got to be of a standard which does not diminish the capacity of that land to continue to produce. For example, you might want to use more saline water for irrigation which is alright in a very short period of time but if you are doing that for the long-term you could damage the soil structure in the long-term. So you have got to think about these things very seriously before you go into a long-term process. By the way, New South Wales is an advocate of using lower standard water for mining operations, for example. Why do you need to use fresh water for washing—

The Hon. Dr PETER PHELPS: Orange phosphate?

Mr HARRISS: Yes, similarly we have a debate with the Commonwealth about the western porous rock and eastern porous rock groundwater sources where we believe they can cope with more use, but the uses of those are not for agriculture because the water is too saline for agriculture. It will be used for things like mineral sands mining and those sort of activities. We have got no problem using that water for those purposes. The issue which is still a consequence for us is how do you dispose of the water that you use? Again I think New South Wales has very good environmental controls for that as well.

CHAIR: Do you have any figures on the amount of urban water that is used on the eastern shore, in total?

Mr HARRISS: We keep figures. I do not have them at hand, but we certainly know that Sydney has an entitlement of 600 gigalitres. If we put that into perspective, that might be about 7 per cent of the total use of water in New South Wales. Agriculture still constitutes 80 per cent or more of total water use in New South Wales, certainly surface water. Most of that is in inland New South Wales. Those figures are readily accessible. They are the sorts of figures we provide to the many delegations that we have from overseas who come to look at how New South Wales manages water, because it is held in pretty high esteem around the world.

(Short adjournment)

CHAIR: Following on from the questions before the break about recycling of some of this urban water, it is something that occupies a lot of discussion at this time, given that we have just been through a 10-year drought, and the amount of water that is used by urban communities and currently goes to ocean outfall systems needs to be addressed. When you say you do not see it is possible to use that water for western agricultural systems, what are your views on other potential uses that it could be used on within the coastal plains areas?

Mr HARRISS: I think agriculture, quite clearly. We have secondary industries, including mining, and typically water in mining activities is not wanted but we still license it because it is a take of water which otherwise would be used somewhere else. If you can recycle water that is used wherever possible and economically possible for those other industries, including agriculture, we should be doing it, but where it is economically viable. Yes, a lot of water goes through ocean outfalls—sewerage and grey water. In New South Wales we have focused on new developments, through BASIX and other planning controls, trying to reduce water use level and to reuse as much water as possible. That is a lot easier to do when you are proposing new urban developments than it is to retrofit an existing area. So, we have focused on that. We also have the Water Industry Competition Act, which enables private users to come in and recycle water within urban areas as well. In New South Wales we have a whole lot of institutional mechanisms to try to reduce water use in the first instance and to reuse that water wherever it is economically possible.

The Hon. Dr PETER PHELPS: There were reports, certainly around the mid-2000s, about the possibility of a large-scale water recycling plant being established at Malabar, to use the Malabar sewerage treatment plant as a source point. Has anything further come of that?

Mr HARRISS: No, I am not aware of that. I was not in charge of the organisation at the time and that would have been an issue for Sydney Water. Like you, I was aware from the media at that time, but nothing else.

CHAIR: The amount of water that is available west of the range for all purposes, if you were able to wave your magic wand, how much extra water do we need in that system to meet various industries' current requirements, and how is that going to change over the next 10 or 15 years?

The Hon. Dr PETER PHELPS: Are you talking about the mandatory environmental flows or just the real use of water, not the hippie use of water?

CHAIR: I am talking about all the requirements placed on water today, which would include environmental flows.

Mr HARRISS: We have probably developed as much as we can the water resources there, and we probably use them pretty well. We will always have a water shortage in a drought. What we have to do, how do you maximise water availability in a drought without just saying, simply, we build another dam, because, as I pointed out before, they are quite expensive and during a drought they are of diminishing value. We have tried to institute mechanisms that maximise the use of water and provide people with the opportunity, if you like, to provide their own drought security. Throughout New South Wales we have introduced a policy of carryover, which got rid of the use it or lose it mentality, so people can now be a bit more frugal or conservative in their water use and carry over water in the dam so it is available for next year if we go into another dry period. That happened after a lot of criticism, but I would hate to go to anywhere in New South Wales now and say we are going to reduce the right of carryover, because I do not think I would come out alive.

We have instituted probably the most advanced water trading mechanisms anywhere, including permanent trade of entitlements, which again raises the issue about who should buy it and whether it could be bought for environment or whatever, but also temporary trades. So, annual trades of water. You might decide at any time there is more interest for you to sell that water on a temporary market, to release that water, rather than to grow a crop. That proved incredibly valuable in the southern valleys during the drought, where there was not enough water available for general security users to grow an effective crop in their own right, so they traded water where it was commanding quite incredible prices to maintain horticulture in South Australia. So, through those institutional mechanisms people can manage their water by either using it or selling it or carrying it over for next year. Again, we have proved incredibly effective in how we use that water. I think that is the point of the Office of Water, to try to promote those mechanisms which enable a better use of water given the variability of climate we have, and enable people to make their business decisions knowing there is a finite limit to that resource.

The Hon. Dr PETER PHELPS: Would you say there has also been behavioural change on the part of consumers? We heard anecdotally when we went to Goulburn that despite the fact that both their dams are back at 100 per cent storage capacity and they effectively had no water restrictions, people are self-regulating, they are using far less water than they did, simply because they have gone through the system of stage 6 restrictions and have said we do not need to use as much water as we did previously. Do you think there is behavioural change amongst people following the millennium drought?

Mr HARRISS: I think there are behavioural changes by people in both rural areas and urban areas and our industries are becoming more and more efficient, not just through the institutional arrangements but water use efficiency technology. By way of example—you have probably heard the example quoted many times—the water use in Sydney despite an increase in 1.5 million people is probably the same as it was in the early 1970s. It shows that people are adopting water use efficiency technology and there has been a change of mindset that you do not waste water. Water is now, by the way, particularly in rural New South Wales, a commodity. It is a highly valuable commodity so people no longer just waste it. If you can trade or if you can carry it over and it is of an economic or financial value to you, you will do that. That is what has really changed the mindset of people as to the manner in which water is used.

We have spent 20 years—and the irrigation industry supports it—of moving away from the use it or lose it mentality to using it conservatively because it maximises the benefits for the industry and it maximises the benefits for regional communities. The same will need to be said of the environmental water holders in the future as well, that they should be using it prudently because it is not just a resource—one of the worst puns in the world—to splash around. You do not want to waste that water; you want to get the maximum value for your enterprise that you possibly can out of a limited resource.

The Hon. PAUL GREEN: It is unusual though that the water utilities across New South Wales that are trying to get demand strategies working—and they are working really well—and that are selling a product are also telling people not to buy hats.

Mr HARRISS: I know.

The Hon. PAUL GREEN: It is a really weird system. Then the ripple effect of that is saving for asset maintenance or replacements. So there is another cost to this.

Mr HARRISS: Absolutely. When we try and get the full cost of recovery from users it at times depends on how much product you sell to recover that. On one hand you are saying be as conservative as possible but we have to recover the costs, including the costs of further upgrades, because there is no magic bucket of money for that. So, yes, there is a vexed issue.

The Hon. PAUL GREEN: I do not know how many investors go out there saying, "Don't buy my product. I want you to reduce using my product." It is quite crazy.

The Hon. Dr PETER PHELPS: I move now to the topic of how you account for water that is released that could in the normal course of events be considered to be an environmental flow but the water is released simply because of excess capacity and yet appears never to be included as part of the environmental flow. The Committee has heard a number of complaints that effectively the environment is getting a double count, in that you have a release that occurs at a natural time, which would be a natural flow anyway, but in addition to that you have got to have the capital letters natural flow and the end result is that downstream, especially in one system, you have flooding at the end of the system where the marsh overflows onto surrounding properties. Does that not represent a material problem and a failure to account for a natural flow as a natural flow in addition to the capital letters natural flow?

Mr HARRISS: We typically account for that water which is set aside and is made specifically available, so in regulated rivers it is the entitlements which are allocated. So we know how much water is specifically released from an entitlement and from someone's account for environmental purposes or from their general security account or whatever. But you are quite right, there are the base flows and we know what they are as well because they are articulated pretty well in the water sharing plans, but that is typically from regulated flows. So we do not really account as any particular use inflows for downstream unless that has diverted for a specific purpose, such as supplementary water rights in some of the valleys.

By way of example, in 2010 over 15,000 gigalitres went across the border into South Australia through the floods we had in the northern part of the system in the Murrumbidgee—probably the most substantial flows across the border in a couple of decades—but that is not accounted in any way as an environmental flow. But we are aware of how much water at any particular stage goes across the system. We have a very developed hydrometric network which can enable you to work out pretty quickly how much water has gone across the border or how much water has passed any particular station over any particular period.

The Hon. Dr PETER PHELPS: In spite of that you would still have had to release a certain amount of water for environmental flows, despite the fact that the natural system has produced many times more?

Mr HARRISS: It would then be up to the environmental water manager to call on the release of that water, just as an irrigator who might have had a whole lot of rain on a property might not call on the use of that water in any particular year—they might choose to carry it over. The environmental water holder will in future be operating just like any other irrigator: We have had 15,000 gigalitres in the environment; do I need to call on any more water? They might choose not to or they might choose to. One of the issues we have now is that if you have a small high flow the environmental water user might choose to make releases to complement that flow or to piggyback on top of that flow. That is fine, that is their call, provided that—again I get back to New South Wales's submission to the Basin Plan—does not have any third party impacts or does not inundate from regulated flows privately-owned land.

The Hon. Dr PETER PHELPS: Does that mean the environmental regulator is exempted from that requirement?

Mr HARRISS: No. It gets back to the point about liability that we talked about earlier. New South Wales has been strong in saying you should not make environmental releases from regulated flows which inundate private land unless you have entered into some form of agreement with that landowner. But we are never going to stop a flood.

The Hon. Dr PETER PHELPS: If that were to have occurred the liability falls on you, does it not?

Mr HARRISS: That is correct.

The Hon. Dr PETER PHELPS: That is an insane situation.

Mr HARRISS: That is why we are arguing pretty strongly that when we develop the environmental water plans under the provisions of the Basin Plan that that addresses the issue of liability.

The Hon. Dr PETER PHELPS: Do you have any ability to say no to a request?

Mr HARRISS: We will say no. We do say no now where we know that the releases would exceed the conventional operating rules.

The Hon. Dr PETER PHELPS: Do you think one of the recommendations that should come out of this inquiry is some clarification of where liability accrues when a downstream flood event occurs because of a request from a user?

Mr HARRISS: I think that would be a legitimate question. We could probably answer it as it stands now, but the issue we have had—

The Hon. Dr PETER PHELPS: But that is through statutory enactment, which would set liability?

Mr HARRISS: Potentially, but you must realise that we also are working with Commonwealth law through the Water Act, which establishes the Basin Plan.

The Hon. MICK VEITCH: By the way, this is coming from someone who does not like creating any laws.

The Hon. Dr PETER PHELPS: No. I am quite happy for the Government to enforce penalty provisions where third parties are being affected by such matters.

The Hon. MICK VEITCH: I know what you are doing.

Mr HARRISS: If I can give you an example. Currently, we release a maximum of 25,000 megalitres a day downstream of Hume Dam to Hume and Yarrowonga. That is typically known as being within channel capacity. Because of geomorphological processes in recent years, some of that has inundated private land. So we have gone through a whole process of recreating easements and something like that. The provision of environmental flows under the Basin Plan to meet some downstream requirements is to increase the rate of release to 42 megalitres a day, which will significantly inundate areas of private land. New South Wales has said, "We do not agree with that" unless you can work out some agreement with the landowners, whether it be easements or whatever, that will enable the flooding of private land from the release of environmental flows. We are never going to stop floods. We do not intend to stop floods. In fact, they provide some positive outcomes for that floodplain land. But where you are making releases from regulated flows, which inundate private land, then we believe that the third party issues have to be addressed.

The Hon. Dr PETER PHELPS: But you are put in an unconscionable position that if you do not release the flows, presumably you are in breach of the contract you have with the environmental manager, and if you do release the flows, you are likely to have a significant deleterious effect on downstream users?

Mr HARRISS: That is correct and it is one of the issues we believe has to be addressed.

The Hon. Dr PETER PHELPS: That then leads to my next question. Do you believe that all managers of environmental requests have the same or a sufficiently high level of understanding of the consequences of requests for water that would be necessary for them to make an informed and reasonable decision in each case?

Mr HARRISS: Certainly within New South Wales I think the people managing the environmental accounts in the Office of Environment and Heritage are well aware of the limits we currently have and are perfectly comfortable operating within those constraints. I think that to get the better environmental outcome, which is being sought by the Basin Plan, will require operating outside of those constraints. That is why the Commonwealth announced the development of a constraints strategy as part of the Basin Plan. New South Wales currently is saying, "Well, given that we have yet to sign up to the Basin Plan, we are reserving judgement on what role we play in assisting in the development of that constraints strategy.

The Hon. Dr PETER PHELPS: So for State officials, yes. Are there other users you think could have greater skill levels?

Mr HARRISS: I think so. A whole lot of people have come into this space over the last few years where it largely has been driven by perceptions rather than reality. But if you look at the new Commonwealth environmental water holder, David Papps had a long career in the New South Wales public sector. He is fully aware of some of those constraints and the associated issues. I do not think it is insurmountable; it is just one of those issues we have to address. The New South Wales Office of Water will not support releases of water that typically inundate private land. We have a couple of different circumstances and exceptions to that rule but, typically, that is where we stand at the moment.

The Hon. Dr PETER PHELPS: That is a perfectly reasonable position, but it would be nice for you to have some sort of guarantee that your organisation will not be hit with a breach of contract or demand for specific performance or any other action taken against it?

Mr HARRISS: As I said, we will work through that as we develop the environmental watering plans consistent with the requirements of the Basin Plan.

The Hon. PAUL GREEN: Obviously, we are moving into the business end of putting together a report on water storages in New South Wales. Perhaps with your wisdom and from the little journey we have had, what recommendations would you find helpful in that report?

Mr HARRISS: From the questions you have asked and some of the issues that have been raised I think you probably have the answers. In our opening submission, which I re-read last night, I did not think our attitude has changed. The point we have made is that new infrastructure is very expensive—the capital costs, ongoing operations and maintenance costs. You have to weigh the benefits and costs of that in what you are doing. We personally think there is probably a significant investment that can be made in using or augmenting better the

infrastructure we have now, and exhausting that before you make a substantial capital investment that requires ongoing recurrent funds. The Office of Water's submission will always be about use what we can as best we can. Whether that be public infrastructure, the way we manage rivers or whether it is water use on farms, use it as efficiently and effectively as possible in the first instance because that is the best return you are ever going to get.

The Hon. PAUL GREEN: Could I clarify an earlier comment of yours about sharing the resource from the dam safety risk management strategies that are building quite expensive engineered—maybe over-engineered—safety barriers. We talked about perhaps using that resource a little more wisely. One thing that since came to mind—it was suggested by some irrigators—is that the resource could be used for much more and better outcomes. One initiative was investment in helping farmers laser level their properties for better water management. That seemed to be one of the best ways for them to get better value out of their water. One initiative was that of the \$80 million we could have lasered quite a few properties that would have a long-term effect on managing the water. I understand it is a private issue, but the gain for the economy and the State probably would have been long term.

Mr HARRISS: I accept that. I just bring to your attention the privatisation of the irrigation corporations in New South Wales in the nineties. Part of that was substantial investment by both State and Commonwealth governments into improving water use efficiency. If you had toured the rice growing areas of the Riverina you would have found that the land and water management plans, which were worth hundreds of millions of dollars, just about all involved reuse of water and laser levelling as well as electromagnetic surveys of land to ensure appropriate clay content. We have moved really into the most efficient, effective and environmentally aware production of some of our crops that is not seen anywhere else.

The Hon. PAUL GREEN: Excellent. Thank you for that.

The Hon. MICK VEITCH: I return to my Tumut River Murrumbidgee River issue. When the Committee was in Wagga Wagga a constructive and innovative suggestion put forward was that one reason the Tumut River flows the way it does is the time frame of getting the water when it is required to the irrigators at the other end.

Mr HARRISS: Yes.

The Hon. MICK VEITCH: The suggestion was that perhaps we could look at some in-stream storages that would assist in the flow, rather than just have a large dam—as you said, some weir-type structures. The suggestion was for one at Wagga to stage and hold the flows. Perhaps that could alleviate some flood issues in the Tumut River?

Mr HARRISS: We investigated options for that probably about five to eight years ago. The only options for substantial water storage that would provide any benefit, really, were, unfortunately, downstream of the off-takes of the major irrigation areas of Murrumbidgee irrigation. So it would not provide that benefit during water demand.

The Hon. MICK VEITCH: That is not quite the information we were provided. The testimony at Wagga proposed a weir structure just below Wagga.

Mr HARRISS: If you raise a weir by a metre, for example, and it might extend 40 kilometres and it is 100 metres wide, it is still not going to provide you with much water. And in terms of a water storage, that is only minor. We found that enlarging Tom Bullen storage and things like that would be possible, but as I pointed out, they were downstream of the major off-takes of the irrigation companies. So they would not provide the benefit during that period of time of peak water demand.

The Hon. MICK VEITCH: It has been investigated?

Mr HARRISS: It has been investigated.

The Hon. MICK VEITCH: And it is not economical?

Mr HARRISS: No. In fact, it was not physically possible. You were not going to provide the kinds of volumes that would offset the releases required from Blowering into the Tumut. I can find the reference for you.

The Hon. MICK VEITCH: I want to talk briefly about decommissioned storages. Earlier you were talking about new technologies and using what we do well, using the existing resource better and things like that. Some of these decommissioned storages with modern technology, once they have been decommissioned we never go back and look at them again, or are they revisited from time to time, or do you have some that you keep in the top drawer—

Mr HARRISS: I am not aware—which storages are you talking about?

The Hon. MICK VEITCH: The Dam Safety Committee told us about a number of storages they were due to decommission.

Mr HARRISS: Most of the storages they look into are mine storages. It is not major storages for public dams. We are not talking of a Copeton, Keepit or Hume dam. For example, there was a decommission of a storage at Bulli, which was above an urban area, which was no longer practical. In fact, it provided a public safety issue so that was decommissioned.

The Hon. MICK VEITCH: So none of those decommissioned storages would be—

Mr HARRISS: No. We look at that. There is another one near Mudgee, off the top of my head. We are currently decommissioning that because it has been there for over 100 years and it does not provide any valuable water storage. In fact, it provides a potential public safety hazard. We are not talking about decommissioning Hume dams or that sort of stuff.

The Hon. MICK VEITCH: Not when you have to spend a lot of money to make sure they stay—

Mr HARRISS: No.

The Hon. MICK VEITCH: I cannot see us decommissioning them. With regard to other jurisdictions, where does your office look internationally to look at best practice? I know you say that we run a very good system and other jurisdictions look at what we do. Where do you go? What sort of jurisdictions do you look at?

Mr HARRISS: We just stay in touch with the normal literature and approach that. We have had reviews done by the Commonwealth, including the review into the Water Act. If you Google John Briscoe, who is now at Harvard University—he was formerly a water policy advisor for the World Bank—he speaks glowingly of Australia's ability to manage through droughts. In January this year I was invited by the Food and Agricultural Organisation to use New South Wales as a case study of how we manage our water through droughts because they recognise that we are fairly advanced. And, quite frankly we are, but when we are talking about comparing ourselves to Third World countries but we are, in my mind, much more advanced than the United States in terms of our water sharing practices.

We are frequently identified and used as case studies around the world. I understand there is an Indian delegation in Australia currently and there is a Chinese delegation in Australia next week, again looking at the way we manage water both at a national level and on a State level. We are frequently requested to provide information to delegations. I think in more recent years one of the issues they are most interested in is the way we facilitate water trade. They have looked at how we have gone through the recent drought and people like John Briscoe have said that it is these innovations which have put Australia well ahead of anyone else and as a consequence people are coming in and saying, "Tell us how it works."

CHAIR: Thank you for attending the hearing. We have resolved that answers to questions taken on notice—you did take a couple of questions on notice—be returned within 14 days. It is 14 days rather than 21 days this time because we are coming towards the end of the process and preparation of the report and so on. If the secretariat gets in touch with you with any questions you took on notice, are you able to get the answers back to us within 14 days?

Mr HARRISS: I will use my best endeavours. I would like to say yes but I cannot absolutely guarantee. We will get them back as soon as we can.

CHAIR: Thank you. Keep in touch with the secretariat if you are having difficulty in that regard, but I am sure you will do your best. Thank you for your contribution to this inquiry. It has been extremely worthwhile.

Mr HARRISS: Thank you for giving me the opportunity to address the Committee.

The Hon. MICK VEITCH: Please convey to your staff that they have been very helpful along the way.

Mr HARRISS: I will pass on that message.

(The witness withdrew)

RONALD KEITH PIKE, and

JOHN DAVID IBBOTSON, sworn and examined:

CHAIR: Are you representing an organisation or appearing as an individual?

Mr IBBOTSON: An individual.

Mr PIKE: I am appearing as an individual.

CHAIR: If you should consider at any stage that certain evidence you wish to give or documents that you may wish to tender should be heard or seen only by the Committee, please indicate that and we will consider your request. Would one or both of you like to make a short opening statement?

Mr PIKE: I would like to thank you for the opportunity to present this submission. I commend the Parliament for creating this Committee; I think it probably should have happened about 10 years ago. I particularly commend the amount of work you have done to date. The submission that I have presented is based on five absolutely irrefutable facts. The first is that New South Wales, and indeed Australia, is not short of water. We have vast quantities of water. It would not matter if the New South Wales population grew to 20 million or 30 million; we still have plenty of water, providing we provide storage. The second fact is that while water is our most abundant renewable resource, in the State of New South Wales its availability is highly variable. All of our rivers go from raging floods that destroy property and State infrastructure, and cause damage, to long periods where there is little or no flow. It is that imbalance that demands that we build storage.

The third fact is that dams do not destroy rivers, contrary to what has been said. All a dam does is store water in times of excess flow for release into the stream in times of little or no flow. All critters in the valley benefit from that, including man. Every dam we build is a pristine, permanent wetland. I have never spoken to a midge yabby or a duck that asks, "Is this a manmade or a natural wetland?" The dams we build are the best wetlands in the country. The fourth fact is this. There are hundreds and hundreds of sites to economically and efficiently build dams in New South Wales. I will not progress that any further. I do not want to get too offside with the previous speaker. But if you want to come with me one day I will take you for a drive and show you some of the dams that we could build.

The fifth fact is this, and this is where it gets back to politics. In 1980, with a population of 3.6 million, the total storage capacity in New South Wales was 21 million megalitres. We had just under six megalitres of storage for each person in the State. Thirty-three years later, the only dam we have built in that time is Split Rock, up on the Manilla River and it is only 390,000 megalitres. We have less than 22 million megalitres of storage in New South Wales. We have less than half the storage per head that we had 33 years ago. But it is actually much worse than that, because what we have done, as the State has bought water and the Commonwealth has bought water, you know what they have really bought? They have bought storage capacity. We now have 1.7 million megalitres of storage in New South Wales that is no longer available for productive, saleable water. We have effectively decommissioned Burrinjuck Dam and nearly half of Blowering Dam.

The other problem we have—and I will conclude at this point—is that, because we have not built base power load to keep up with the demands of our growing population, we now have Snowy Hydro keeping the lights on in Sydney every evening. The end result of that is, we have lost a lot of the storage in the Snowy Scheme for productive water. I invite you to go to their website. Tantangara Dam has not been above 25 per cent for 13 years, except for the odd day. Tantangara, by the way is the highest dam on the Murrumbidgee river. All that water gets diverted, on a daily basis, into Eucumbene so they can turn it into power. Eucumbene is the biggest dam in New South Wales. It is over 4.5 million megalitres—two and a quarter times the size of Warragamba.

I invite you to consider this scenario: Following two and a half years of the highest run-off since the Snowy scheme was built, that dam is now 46 per cent full and dropping dramatically. In actual fact, New South Wales is down to about 18 million megalitres of water. This cannot continue, gentlemen, we have to correct it. I will leave it with you at that point.

CHAIR: Mr Ibbotson, is there anything you would like to contribute?

Mr IBBOTSON: Good morning. Yes, I would like to agree with everything that Ron said. Thank you for giving me the opportunity to talk to you and to answer questions about the adequacy of the storage and efficient use of water in New South Wales. My original and supplementary submissions highlight some of the planned shortcomings. They include comments on the Lower Lakes—the whales in the fish pond—as well as additional comments on storing water, environmental watering and a dam on the Clarence River. I hope my submission comments will be of some value to you.

I was born in Finley before the Mulwala Canal was finished. It was a dry, dusty backwater of a place. There were three pubs and they were always packed because the beer was supposedly cheaper than the water tanked up from Tocumwal—well, that's what they said, anyway. With irrigation, Finley changed into a little town with a future. But something is happening to that town. Many houses are for sale; jobs are scarce; the future looks bleak—and it is not just because of the ten-year drought. Droughts come and go and the farmers knew that they could recover during the next wet. Unfortunately, they see water from the future wet seasons being taken from them.

Stolen water is not the only problem. Expenses for no return are also rising. The Government buys back the water rights from random farmers. Those farmers no longer pay for the irrigation infrastructure, so their contributions are added to the costs borne by the remaining farmers. Those costs have to be paid, even when they receive no water. They do not see a future for themselves and their families. The pubs, once again, are doing a roaring business but this time for people with no hope as well as no water.

Water should not be a problem. After the Amazon, Australia has more water per head of population than any other country in the world. It has a hundred times the amount of water than places like England. And yet, we want to convert sewage into bottled water; build humungous desalination plants; and take water from our most productive farmers. We need to learn to efficiently capture, store and use it. We live in a country—in fact, a world—where our leaders are wanting to send us back in time. In my local paper, I describe our council as a group which is driving us into the future while looking in the rear vision mirror. Today, there are many in authority who start out with ideals but lose them. They get carried away by their own importance.

I used to enter photographic competitions when I lived in Alaska. Often, the worst photo, judged from any aspect, would win. We asked one judge why this happened. He replied: "Well, if I picked the best one or the one that everybody liked, I would lose mystique as a judge and just be one of the pack. I would lose my importance and the respect I have been given as a judge and that is not acceptable." His comments forever changed my way of looking at people's motives and I have never entered another photographic competition.

This does not explain why I have such an interest in what is happening in the Murray-Darling Basin, apart from having been born there. Returning to Australia after 20 years overseas, I took on a project to photograph every lighthouse in Australia. The end result was two books that are now considered the reference books on the subject. While doing this, I realised that solar is great for small applications but not 24/7 power. This led me to look at the global warming debacle which resulted in my writing the first sceptical man-made global warming book published in Australia. It also revealed why the environmentalists are a negative influence on our prosperity and our way of life.

When I reviewed the original Murray-Darling Basin draft, it became clear that green environmentalists were having a dominant influence on the plan. The final plan is no better. This is shown by the anti-people bias that is evident in it. It is another disaster in the making. So why is this plan so important to the future of the Murray-Darling Basin? With a good plan, communities will have a sound foundation on which to prosper; with a bad plan, they will die. As it stands, it is a bad plan. It will reduce the allocation of water that is a community's lifeblood. It creates uncertainty as to whether there will be enough water for them during the good years. People have become subservient to the needs of the trees. Country communities are already battling new labour laws, increasing costs, a lack of services and the inability to offer young people a future. The new water rules could be the last straw.

Even now, we see community after community slowly, but surely, withering. The current Murray-Darling Basin plan will only exacerbate that process. A forest, without artificial watering, will rejuvenate; once a country community is gone, it will never come back. That is what I had written in my supplementary submission. I included a couple of random food quality documents. One was on pigs in China, that they found 13,000 diseased pigs floating down a river that was going to go into the Shanghai water supply. Their basic comment was, "We don't know where they came from". That is pretty remarkable, for 13,000 pigs. The people and other farmers, we really have no control over the quality of the food they produce.

The second article was from the United States, where they have been doing research on the rice they import from China. They have found that this rice has excessive amounts of lead and heavy metals. They went to China and looked around the rice fields. They found that large numbers of the rice fields were watered with untreated sewage effluent and untreated industrial effluent. These are possible products that we might end up buying. One of the reasons why we might end up buying the pigs and rice from China—they also commented that most other producers in the world are also producing product that is outside the standards—but I was looking through Murray-Darling Basin Authority document the other day and it had statistics. It said that the Murray-Darling Basin produces 62 per cent of the pigs in Australia. It also produces 100 per cent of the rice that is produced in Australia. And here we are, trying to shut it down. This is stupid. Thank you.

The Hon. MICK VEITCH: Mr Pike, you will have heard my earlier comments about the Tumut River. I note in your opening comments you said that the rivers are not impacted upon by the construction of the dam. The people of Tumut love their Blowering Dam, that is an undeniable fact, but what do you say to their comments that the releases of water have changed their river?

Mr PIKE: I can explain it to you very easily. First, I walked the Tumut River from top to bottom long before the dams were there. My background is as a freshwater fisherman as well as an irrigator. I know and love and understand every river in New South Wales, or Australia for that matter. There were no dams on the Tumut 45 years ago; there are now four dams on the Tumut. When they built Blowering Dam in the 1960s, the then Water Conservation and Irrigation Commission was well aware that releases from Blowering could cause some problems in the Tumut River. In about 1961 they got the bulldozers and backhoes in and they terraced the outside of all the bends in the river, rock filled them and planted willow trees. The outlet from Blowering Dam is no different today from what it was the day they opened it; it is exactly the same outlet. There has been no problem in the Tumut River for 30-odd years until just recently. Do you know why?

The Hon. Dr PETER PHELPS: De-willowing.

Mr PIKE: The environmentalists got in and pulled out all the willow trees. Anyone who knows anything about water and rivers knows there is no better plant on God's earth to hold a bank together than a willow tree. They are all gone. The next thing that happened was that the NSW Office of Water reacted to the Murray-Darling Basin Plan and is now releasing water when there is already high flow in the river because there is a goddam ridiculous idea that it is good for the environment. It is a manmade problem that is not necessary. End of story.

The Hon. MICK VEITCH: So it has been impacted?

Mr PIKE: Of course, but unnecessarily.

The Hon. MICK VEITCH: When I asked this question of Commissioner Harriss earlier I saw some head movement. It was to do with my question about in-stream storages along the Murrumbidgee, in particular weirs, as a way of maybe reducing the requirement for the higher flows, particularly in the Tumut and upper Murrumbidgee, but essentially, rather than have high flows for the full length, to better manage the delivery of the water to the irrigators. Do you concur with the Commissioner's comments about the weirs?

Mr PIKE: Absolutely not.

The Hon. MICK VEITCH: Can you explain?

Mr PIKE: Can I ask you, and I will not be upset if you say no: Have you read my submission in detail?

The Hon. MICK VEITCH: I have. I have it here.

Mr PIKE: Please do, because the answer to your question is in there. The only dam on the Murrumbidgee River of any consequence is the first dam west of the Great Divide, which is Burrinjuck. There are 12 major creeks flowing into the Murrumbidgee below Burrinjuck Dam and God knows how many little ones. Most of the high flow in the river comes from those creeks and that is what causes the floods. The reason we need storage downstream of Burrinjuck Dam is twofold. I am not talking about a little weir east of Wagga; I

am talking about at least three quarters of a million megalitres. Believe me, if we do not build it soon the Government will not be a real happy place to be.

The Hon. Dr PETER PHELPS: Where do you build that without it turning into just a giant evaporation pond?

Mr PIKE: Can I finish this question and I will very happily answer that one. It is a very important question. When growers or irrigators need water in the MIA and the CIA and further down, water ordered today is released from the dam and it takes six to seven days. If there is a thunderstorm in the irrigation areas, which happens on a regular basis in the summer, everyone stops watering. All the water in the system then flows down to the sea and is wasted because there is nowhere to store it. As the Commissioner said, the only downstream storage is Tombullen Swamp, and I think it is about 11,500 megalitres. It is absolutely essential that we build further storage in the Murrumbidgee and some of the other rivers so that Mr Harriss can more effectively manage the water. Vast quantities of water flow down the river in every flood, and this is where I disagree with the Commissioner.

Back to evaporation. There is no more important link in the chain of life than evaporation. It does not matter where we store water, some evaporates. Let us say we build the dam where I suggest, at Wagga, and let us say the commission sells only 200,000 megalitres extra of water a year. It does not matter that 40,000 or 50,000 megalitres of water goes into the air; it does not matter a tinker's cuss. We either store it there and sell the excess or we let it flow down the river and evaporate in the sea. This applies to all of our dams. The idea that we have efficient dams and inefficient dams is largely rubbish. All a dam does is give us the opportunity to manage water in the better interests of mankind and the environment. That is all we are doing.

While we are on that subject I might touch on something else. It has to do with whether we can afford to build dams. We cannot afford not to build them because otherwise we will run out of water. Let us say we build that dam east of Wagga and it is not a huge dam and it will be a rock and earth-filled dam. If it gives us 200,000 megalitres extra of water a year and it is a less efficient dam than Burrinjuck, we have still got 200,000 megalitres extra in Burrinjuck, which is more efficient because we have used the 200,000 megalitres out of the other dam. Do you know how much money 200,000 megalitres of water generates for the State per year? Without any multiplier effect, at farm gate it is just short of \$50 million. The State income is in excess of \$8 million just from that extra water. Does that answer the question?

The Hon. Dr PETER PHELPS: Yes.

The Hon. MICK VEITCH: Yes. What is the location of the dam you are proposing east of Wagga?

Mr PIKE: There has been no detailed work done as to where, but understand once you have a valley like we have got east—

The Hon. MICK VEITCH: Between Wagga and Gundagai?

Mr PIKE: Yes, more or less. Somewhere in there. We need to pick up that water that comes out of the Jugiong Creek, Kyeamba Creek, Tarcutta Creek and Hillas Creek. We should also build a dam on the Tarcutta Creek, by the way. There is a lot of irrigation on that creek and every time there is a dry year they run out of water, but I have seen the Tarcutta Creek five miles wide plenty of times. People do not understand that once the rivers leave the foothills of the Great Divide they flow below the floodplain. They have not eroded into it. The rivers have deposited the floodplain, and that is why all the floodplains slope away from the river. They all flow—forgive me, I still think in imperial measure; the Chairman will understand why because we both worked in the soil conservation service many years ago—between 25 and 45 feet below the surrounding floodplain.

When the Commissioner and the Murray-Darling Basin Authority talk about an environmental flow all it is words. It matters not whether the Murrumbidgee River at Narrandera is flowing at 4,000 megalitres a day or 40,000 megalitres a day—and that is all the water they can let out of the dams, believe me; the pipes do not handle any more than that. It does not make a single scrap of difference to the environment. It is still within the channel of the river and all it does is run into the sea to waste. To put water over the bank of the Murrumbidgee River at Wagga requires 110,000 megalitres of water a day. It can only be a flood.

When we have a river gauge it fairly accurately measures water up to the top of the river bank. Once the flow is outside the river bank no-one in this State has any idea how much water is flowing down the valley. I

can assure you it is 10, 15 or 30 times more than what appears on the record. The Lachlan flows 70 miles wide in any sort of a decent flood. The Murrumbidgee, when it floods to the south, flows back into the Murray; it flows right across the flood plain into the Murray. The reason I am telling you all of that is because the capacity for more water storage in New South Wales, and particularly in the Murray-Darling Basin, is huge.

The Hon. PAUL GREEN: Mr Ibbotson, I note in your submission you mention the Clarence River and the benefits of maybe having a dam there. Could you elaborate on that?

Mr IBBOTSON: I moved up there about five years ago and I became interested in looking at the Clarence River for water for the Murray-Darling Basin, but there is just a very strong community feeling that water should not be pumped out of their wonderful river and they had this great campaign called "The mighty Clarence—Not one drop", which is a very inappropriate thing because the whole community of the valley only uses 1 per cent of the water that goes into the Clarence River; the other 99 per cent goes out to sea.

There have been three major people who have looked at making dams on the Clarence Valley: there was Earle Page, there was the Rankin and Hill group in 1981 and there was Lance Endersbee who was the one who designed the Snowy Mountains Scheme. Their designs were to put in multiple dams, tunnels, pipelines, gosh knows what else, to pump water over the mountain. In the case of Earle Page it was mainly to put in hydroelectricity so that there would be good power between Sydney and Brisbane, which did not exist when he was looking at this in 1945.

Interestingly, I had not heard of Earle Page's work until I took out a four-page ad in the local paper, which cost me a pile of money, to say why we should build a dam on the Clarence River using a completely different set of criteria first for flood mitigation—we have had five floods there in the last five years, including three this year—and for tourism. If you look down the New South Wales coast, there is no freshwater lake on the seaward side of the mountains that really encourages tourism; most of them are water catchment areas and they do not allow tourism or people or boats or whatever in them. There are a couple of smaller ones but there is no major one. A dam at the Clarence Gorge would create a lake that goes about 40 or 50 kilometres up the Clarence and 40 or 50 kilometres up the Mann. Because it is not needed for water to supply it, like Warragamba, you do not have to worry about having a certain amount of water left in it. If you were going to get a flood you would empty out the dam and then let it fill up.

The whole economics of what was done by the earlier three proposals—they did not consider mitigation, they did not consider tourism at all. You have now got 50,000 people living in the flood plain of the Clarence River and they get wiped out, and they get wiped out regularly. The council does not have the money to do it. As an example, in this latest flood there has been a whole lot of trees washed out to sea; they turned round and washed up on the beaches. The council spent some money to get rid of the trees on the Yamba beaches; other beaches, which were major tourist attractions in themselves, the council said, "We are not going to remove the trees", and, from photographs, you cannot even get over the trees on the beach to get to the water. They are wiping out the beaches.

The council is completely against it; they say, "No, we do not want any diversionary water. No, we do not want a dam. No, it is uneconomical"—even though they have never done an economical analysis of a mitigation tourism dam—"No, the people do not want it", but they point-blankly refuse to do a survey to ask the people, which is very bad. As far as pumping water over the mountain, which I have dropped because it would never get to the dam doing it any other way, the dam could still provide water over the mountain, and probably provide it reasonably economically. There is only the one dam and this is the dam that would be built on Clarence Gorge, just after the Mann and Clarence rivers come together, and it, effectively, collects all the water from everywhere else.

All the rivers they have previously talked about putting dams on all get down pretty low because all the water just rushes down the sides of the mountains into a big trough, which happens to be the Clarence and the Mann. From the gorge you could take a pipeline up over to the Severn River; it would be 70 kilometres long and it would go up 1,000 metres to get it up and over. I spent a couple of years working on the Trans-Alaska Pipeline when they were building it, which is an 800-mile pipeline that was pumping oil down to Valdez; it went over 3,000-, 4,000-foot high mountain ranges and in the last one they pumped it straight up 4,000 feet before it went down—and this is 30-year-old technology.

Pumping water up 1,000 metres or 3,000 feet—a bit over—is quite doable; it could be done with one set of pumps at the bottom, although it would probably be better to have a set of inline pumps halfway up. It

would be just a straight pipeline that literally follows the Gwydir Highway that goes up and over the mountains. With a two-metre diameter pipe you could get 500 million litres a day, or if you had two pipes you could get one gegalitre a day. If you did that 365 days a year, that is 365 gegalitres, but the river has a capacity of around 4,000 to 5,000 gegalitres per year that flow down into the sea. So it is perfectly reasonable, it is just that the people in the valley are adamantly against anything that looks like progress.

The Hon. PAUL GREEN: From reading your submission it seems that you feel that maybe the council is dead against it, so to speak, but the community—you talk about maybe a survey. Do you have some ideas of how one could approach community engagement to follow up what you think is a way forward?

Mr IBBOTSON: The council says that it is not their problem, it is a State problem, whereas the politicians, such as Barnaby Joyce, say that they would love to build a dam up in the Northern Rivers but until they got the councils to say they would like to have one it is politically impossible to do that. One thing the State could do is to say, "We are doing surveys of whether people along the Northern Rivers would be interested in having a dam. In the little surveys I have done, and which were admittedly not very scientific surveys, up to 80 per cent of the people I talked to—whether it was at a Rotary club or shopkeepers or the farmers or whatever—were saying they feel they need something, to do a minimisation or flood mitigation within the valley, because until they do the valley cannot advance; it gets a bit ahead and then it all gets washed away and they start all over again.

The other interesting thing is the council—I think partially because of the advertisement I put in—suddenly decided they would re-initiate the climate change committee they had, the global warming committee, particularly to look at the one-metre rise in sea levels that are going to occur by 2100. Of course, in reality, we will be lucky if there is a sea rise of six inches, but we will not go into that. I wrote to the mayor, and said you have kind of shot yourself in the foot. If you are going to have a committee that is dealing with a one metre sea rise, then that means the current high tides will be the low tides, and the current high tides will be another metre higher, and if a spring tide or a flood tide occurs now during a flood, the levies will not hold it. Every time a flood comes down, it is going to go to the levies, so the levies that exist would not be sufficient for the increases in sea level. The Mayor did not reply.

The Hon. PAUL GREEN: In respect of the 70 kilometres of piping that you mentioned, did you do any modelling of the price to push the water up the hill? It is expensive to push water uphill.

Mr IBBOTSON: I have not done any modelling for that. Personally, I do not have the capability to do that.

The Hon. PAUL GREEN: A lot of water was being pumped from the Shoalhaven River to Sydney in the midst of the drought and it was costing millions. It is not a cheap energy bill, by any means.

Mr IBBOTSON: That is true, but there is also enough water coming down the Clarence. As I say, it is 4,000 to 5,000 gegalitres a year, so you could have quite a reasonable hydro capability built into the dam.

The Hon. PAUL GREEN: That is what I am suggesting. Where are you getting the energy to push it up the hill?

Mr IBBOTSON: The energy could come from a hydro plant in the dam to do the pumping. It would be a straightforward 70 kilometre uphill pump. People are building dams all over the world that are huge. They are building ones that are ten feet in diameter and water is being pumped to other places.

The Hon. PAUL GREEN: I was at a function last night where the Insurance Council of Australia was praising New South Wales for the way that they are going forward and achieving less flood issues. That would carry weight with what you are trying to achieve, that flood mitigation is costing this State a lot of money. Obviously we need to be doing more to flood-proof New South Wales, particularly in regions such as Coffs Harbour where they are having multiple floods a year. There is merit in what you are talking about.

Mr IBBOTSON: The Clarence is an interesting river to put a dam on. It is a little bit like up in Western Australia—

Mr PIKE: Lake Argyle.

Mr IBBOTSON: Lake Argyle is the whole basin, and there is only one narrow little place that comes out of it. You put a dam across the Clarence Gorge, and it backs up the water for 50 kilometres, 60 kilometres in each direction, and effectively every piece of water that falls in the Clarence catchment, which is about 2,200 square kilometres ends up coming through that one spot. It is like a great big bathtub. That is why they get horrendous floods. This year I have had 1,050 millimetres of rainfall in my backyard. When I was writing about this a couple of years ago, a lady wrote back in, and said, "Oh, but we have droughts in the Clarence Valley. I can remember in November 2009 we had a drought." I also look back at my rainfall records and I had 100 millimetres of rain in November. It is a huge sluice. They will get three days of rain and the whole lot will be out to sea from then.

The Hon. PAUL GREEN: One of the points I am making is that the people of New South Wales are getting sick and tired of their insurance premiums going through the roof. With climate change predictions and flooding, some premiums are increasing by exponential percentages on their previous years, based on modellings, floodings and accounts. The people of New South Wales would be keen to find a way to see their premiums drop.

Mr IBBOTSON: I thoroughly agree with you. In the Clarence, the insurance companies have changed their one in a 100-year flood to being a one in 20-year flood and people's flood insurance premiums have gone from \$1,000 a year to \$10,000 a year.

The Hon. PAUL GREEN: Exponential, as I said.

Mr IBBOTSON: Yes.

Mr PIKE: Can I say something on flooding, and please try to read my submission, because I cover it in some detail. It is physically impossible—and we can demonstrate this—to mitigate flooding simply by building one or two large dams. If you doubt that, the biggest flood mitigation dam in Australia is Wivenhoe, west of Brisbane. It was empty a few years ago.

The Hon. Dr PETER PHELPS: That was built with a specific flood mitigation plan in mind.

Mr PIKE: That is exactly what I just said. It is the only one in Australia that has been built that way. But it was physically incapable of stopping Brisbane being flooded twice in the last two years. If we are going to involve ourselves in flood mitigation, it has to be a whole-of-valley exercise, which the Chairman will understand because of our background. I deal with it at some length in this paper. We can do it in the future and we will do it in the future, but it has to be a whole-of-valley exercise. It cannot be just a couple of big dams.

The Hon. PAUL GREEN: Will you continue with that? It is a line of questioning I want to pursue. Please outline how that approach will work.

Mr PIKE: All valleys are drainage systems; all rivers are drains. The excess water that falls on the earth makes its way back to the sea or, in some cases, to inland lakes. They are all fed with multiple tributaries. When you get a whole-of-valley heavy rain event, and of course human activity adds to some of this of course—obviously—the only way you can stop a flood realistically is to start by putting check dams—there are pictures that explain it in my submission—permeable dams on the creek, so that you slow the flow of water down before it gets to the main stream. In other words, instead of getting half a million megalitres out of stream X in two or three hours, that half a million flows over a period of three or four weeks. Then you put some fairly serious dams in the main creeks and, in the main river, you put your two or three dams that are there primarily for water storage, but also to pick up some of the excess flow and flood mitigation. That is the only way you can totally control the valley.

The Hon. PAUL GREEN: One of the concerns expressed in respect of productive land use and environmental issues is trying to balance or at least mimic the natural flows of rivers over a long period of time.

Mr PIKE: Can I say, it is absolute nonsense. Let us go back to the situation before white man came here. All of the rivers—and we will confine it to New South Wales for the moment—went from massive floods to no water. Massive floods are destructive to all critters in the environment. There is nothing quite so useless as a wild river with no water in it. Modern man has the capacity to improve the outcome for the environment, all critters that we share it with and for mankind. I will touch on something that the Commissioner said. He said dams are very expensive to maintain and operate. Nothing could be further from the truth. Dams are expensive

to build, but once you build them, they are there for hundreds and hundreds of years. You can maintain the outlet—let us say you have a dam at Talbingo, you can turn the outlet on and off from Sydney. They are incredibly cheap to maintain and operate. The claim that dams are expensive to maintain and operate is nonsense.

The Hon. Dr PETER PHELPS: I think what he was saying was that the management of the water is expensive.

The Hon. PAUL GREEN: Infrastructure.

Mr PIKE: Do you know what happens? It runs downhill. It does not cost anything.

The Hon. PAUL GREEN: Rainfall is free; the infrastructure and management is costly.

Mr PIKE: It has only been made costly in recent years.

The Hon. PAUL GREEN: Yes, and we talked about that by giving value to the price of water that will make people manage water more diligently, which is happening and, of course, the ripple effect is the ability to service assets and maintenance plans with the dollar is somewhat compromised. We have had that discussion and so I will move on to something else. I appreciate that what we are trying to do here is manage water 365 days a year. I also acknowledge that pre-white man, as you have noted, there were dry times and wet times. I am not an environmental scientist, but I would say that those beds are dry for a season for a specific reason. I could not tell you why, but it may be that germination or microbiological things happen during the dry season. I would argue that there is a purpose to it. But for the sake of trying to better manage water, which is what we are trying to do here, obviously those streams could be filled 365 days a year.

Mr PIKE: Can I try to kill a couple of misconceptions? The delivery and application of water across New South Wales has been constantly upgraded and improved since the 1940s. The claim that irrigation practice in New South Wales was somehow not efficient is and always was totally false. The desire to be more efficient is no different in the farming business than it is in any other business. The claim that we can suddenly save some water by making irrigation application more efficient is really rubbish. I have studied and worked with water for all of my life. I have travelled and studied water application in North America, Central America and China. I started doing that 40-something years ago. I can absolutely guarantee you that the methods of distribution and application of water in New South Wales are as good as anywhere in the world. That was the case in 1950, 1960, 1970; it is just that the technology has improved. So let us get away from that.

The other really important fact is that there is no more important part of this submission than the flood records from Wagga Wagga on the Murrumbidgee. This gets back to what you were saying about wet and dry. Technically you are correct there, but there is nothing quite so useless as a dried out wetland. It is no good for the critters; it is no good for anybody. The claim that there have been less floods in the Murray-Darling Basin since we built the dams is false. It was always false. We can argue and hypothesise as to why that might be, and I think the answer is very simple, but there have been nearly twice as many floods since we built the dams as there were in the recorded time before. Please look at my submission. There is nothing more important than that fact. For government to be interfering and saying they are going to try to manufacture a flood, first of all they cannot do it. It is physically impossible. Secondly, what do they think they are doing? There are not less floods; there are actually more. Hasn't anybody looked at the television in the last few years? The claim that we need to release water for "the environment" is and always has been false. It is not right.

Mr IBBOTSON: I might add to that, as I said in mine, that the over-the-bank flooding is a completely ridiculous idea. As I said, it is like a couple of kids jumping in a bath, filling up the bath with their tank water so it overflows the bath so they can mop the floor for their mum. That is about the level of what over-the-bank flooding is. It is just a complete, utter and impossible waste of water. You do not do anything like that. If you are going to do environmental watering, you hand it over to the irrigation farmers and tell them to set it up like an irrigation project. We need some water out of the river and if the river level happens to be 20 metres below the bank you pump the water out and then you guide it down to where you want it for environmental watering.

You also only do the watering when and where it is needed. For example, there may be a marsh somewhere that the birds from Japan come in and nest and breed in. It is no good if we rely on a flood and it comes a month after they have done it. With environmental watering that is planned and done like you would

with irrigation you say, okay, we will pump some water into that swamp for this particular purpose. You do not go saying, well, we will just try and do over-the-bank watering or arbitrary watering.

The other thing is that one of the major factors that is forgotten in this whole Murray-Darling project is that 94 per cent of the water that falls on the Murray-Darling Basin never gets in the rivers. There are 530,000 gegalitres of water that fall on the Murray-Darling Basin and 22,000 gets into the rivers, which is about 4 per cent. I actually called Murray-Darling Basin and said how much water flows into the rivers and they said that they did not know. I eventually found a 2003 document from Murray-Darling Basin that said 4.7 per cent actually gets into the rivers. If no water was taken out due to evaporation and so forth along the river that by the time it got to the mouth only 2.5 per cent comes out the mouth. The other 94 per cent does not get there.

A few days ago I found another document that was done in 1995 and they said that 94 per cent gets evaporated, 2 per cent soaks into the ground and 4 per cent actually gets into the river. That was a second document that says it. One has to wonder why are we doing any environmental watering at all, because 94 per cent of the water that falls in the basin falls all over the basin and waters whatever there is. Here we are frantically trying to take the remaining 4 per cent and use it for—

Mr PIKE: To flush it down the river.

Mr IBBOTSON: For flushing down the river or for watering things that have had 90 per cent of the water available to them. The environment has survived for tens of thousands of years. Some gum trees may die and so forth, but lo and behold you get a real over-the-bank flood, an actual one, and they rejuvenate. They do not need the water. In fact, sometimes particularly for eucalypts too much water will kill them. With all the rain I have had in the last thing in my back yard, I have had half my eucalypts die because they have had too much water.

The whole concept of the Murray-Darling Basin is wrong. What we should be doing is saying, okay, we have got our 4 per cent of the water in the rivers, what are the important uses of it? They are for providing people water, industrial water, farming water and specific environmental water for doing things like watering a swamp that is used for breeding or such thing. The fact that we had a 10-year drought and we said the birdlife and the wildlife and whatever was damaged or gone, get a couple of good floods and they are back again. They do not need it. They have never needed it. As for dams, the dams and weirs on the Murray, in the last 10 years the Murray has never been dry. There has always been water sitting in the Murray and yet I have got photos at home of people at Echuca having their Christmas lunch in the middle of the Murray riverbed.

CHAIR: Can I go back to your comments on the Clarence River dam. The proposal that you suggested being at that 80 metre and 100 metre contour, can you tell us the storage of that structure at each of those levels?

Mr IBBOTSON: That seems to be a very common question. I have just put all the contour maps together and marked all the 100-, 90-, 80-, 70- and 60-metre contours. They are with a water engineer who is determining the actual volume.

CHAIR: I ask because if we are talking about using a dam for flood mitigation obviously the critical issues are the full supply storage or the flood surcharge storage compared to the expected flood flow in the river where you are trying to affect that mitigation. Do you have any idea of the relationship between that storage and the flood flow in the Clarence River when it is running at top level?

Mr IBBOTSON: I refer to what Earle Page said in 1945. Based on the dimensions and where I said we should build it was about 50 metres apart. That was interesting. He said 4,200 gegalitres could be held in the dam. My rough estimate was that there would be about 2,500 gegalitres and someone said less than that. That is why it is a critical figure. It is the last critical figure I have to get hold of—exactly how much it will hold. I hope to have that in a couple of weeks.

As for the mitigation, in all my writings I talk about minimisation more so than mitigation. In our main flood in January they said there was 1,500 gegalitres of water coming down the river each day. In Copmanhurst a house that was 25 metres above the level of the river was washed away. They get horrendous surges of water. Because the dam is not needed for water storage or whatever, if you said flood rains were coming you would empty the dam so that it was effectively empty when the rains came. They say that in the January flood there was about 1,500 megalitres a day going down the river. If the dam held, let us say—

CHAIR: Megalitre or gigalitres?

Mr IBBOTSON: Gigalitres. If there is 1,500 gigalitres coming past Grafton, what is the height of the river at that point? You then go back through the records and see what the height is when 1,000 gigalitres flow through. We might say that the dam will hold 2,500 gigalitres. If the floodwaters come down, we let three-quarters of it through and keep 500 gigalitres behind the dam. It would then be one-fifth or one-quarter full. On the second day, again the same amount comes down and you let three-quarters through and hold 500 gigalitres. After four days you have filled the dam but reduced the floodwater going down by 20 per cent or 30 per cent. We do not have flood surges that last more than three or four days. It rains like hell and all the water races down and comes out. It is a very fascinating river valley. They say that if you can get it down from 1,500 gigalitres at Grafton Bridge to 1,000 gigalitres, the difference in the flood effect is incredibly significant.

The Hon. Dr PETER PHELPS: Mr Pike, my concerns relate to the economic efficiency of flood mitigation approaches—raising the dam walls and the creation of new dams purely for flood mitigation—and the economic viability of doing that. Do you have any views on that?

Mr PIKE: Yes, I do, and I agree with you 100 per cent. If you read my submission you will see that. I cannot and I certainly do not try to justify spending money on flood mitigation. It is much more important in this environment that we store water for future use. All of the dams I have here are here for that purpose and that purpose only. The reason I pointed that out is that if we are going to flood-proof a valley it is an extensive, expensive exercise and I am not advocating that.

The Hon. Dr PETER PHELPS: And ultimately futile, because you cannot flood-proof a valley unless you have a very extensive series of water catchments.

Mr PIKE: Please read the submission. If members have some thoughts over on the next week or two or before the final report is written you can ring me. I am happy to talk at any time; do not hesitate to call me.

Mr IBBOTSON: I refer to the possibility of preventing floods, mitigation and the Brisbane flood. They tried to use Wivenhoe for two purposes—water supply and flood control—and they let out some water. One of the problems was that when the water flooded Brisbane a large number of houses were flooded. Apparently a number of years ago they did an engineering study and the engineers said there should be no buildings below a certain height. The Government said to hell with that and built them two or three metres lower down the valley. If they had stuck with what the engineers said there would have been no flooding in Brisbane.

CHAIR: I suspect that same problem already exists in the Hawkesbury.

Mr PIKE: I am sure you are right.

Mr IBBOTSON: It could apply to lots of places.

The Hon. Dr PETER PHELPS: You made some comments about Snowy Hydro. Surely you see it as legitimate that it uses the water for productive energy creation purposes?

Mr PIKE: I will try to make this brief; the real story would take some time to tell. It is expensive to build a dam for hydro power production. However, once it is done the cost of producing power is incredibly low.

The Hon. Dr PETER PHELPS: And more importantly near instantaneous.

Mr PIKE: The beauty of it is that it can be turned on at the flick of a switch. I must say that it is the State Government's fault that this has happened. Because Snowy Hydro now supplies peak power demand what should be our cheapest source of electricity is now our most expensive. That is because of market forces. Snowy Hydro makes a lot of its money out of trading electricity. The State does not have sufficient baseload power. Under the new 75-year lease Snowy Hydro can release water whenever it wants and at whatever volume it wants. I am happy to email the Committee a paper explaining this.

Because of all the laws that have been put in place downstream, a lot of that water now runs to the sea and to waste; we lose it. If Hume Dam and Blowering Dam are full, which they were a year or two ago, all the water that Snowy releases just increases the flood pressure down the system. It is not working the way it was

meant to work. That is why the first two dams that need to be built in New South Wales—and I will be very frank about this—are the Gateway Dam on the Murray at the junction of the Swampy Plains River and the Murray River below Khancoban and the Welcome Reef. If we do not build that, a lot of the water that is released into the Murray from here on will be wasted and gone forever, and we are going to lose productive capacity.

It is also the reason we have to build a dam east of Wagga Wagga. We have nowhere in which to store that extra water. What we need to do is build more base load power stations, or at least one—Bayswater should have been built years ago—and then, as we build more dams, we will create more hydro power because every dam creates hydro power. We can get back to a stage at which Snowy Hydro is not releasing water over and above their approximately million megalitres into each river a year—it is just over a million—and we can more effectively use that storage. At the moment we have wasted storage there and it is caused not because of water but because of the way we need to generate power. Does that make sense?

The Hon. Dr PETER PHELPS: Yes.

Mr PIKE: Those two dams are essential and then of course we have to build the one on the Shoalhaven. What is it called?

CHAIR: Welcome Reef.

Mr PIKE: Otherwise the South Coast will run out of water in a few years, believe me.

The Hon. PAUL GREEN: No, the South Coast will not run out of water. Remember it gave Sydney half of its water when Sydney needed it.

CHAIR: Mr Pike, just in relation to that, I refer you to the comments in your submission about Lake Mejum in Narrandera.

Mr PIKE: Near Narrandera.

CHAIR: That sort of approach is to put in shallow temporary storage, if you like, further down the river. Essentially, when the releases have been let go for irrigation and then it rains, that water is going to waste.

Mr PIKE: Yes.

CHAIR: We have a concern about shallow storages in warmer climate areas because of evaporation losses associated with it, but I think from what your submission says, in those situations you can use those shallow storages in some of those warmer climates as temporary storages rather than long-term permanent storages, which then allows you to keep the water upstream in the deeper permanent storage.

Mr PIKE: Absolutely. Anyone who knows and understands the system in a practical fashion—as I do because I have worked with it all my life—knows that it does not matter that they are shallow. Lake Mejum has a problem because the original plan required pumping the water up into it. That was back when off-peak power was incredibly cheap. It no longer is. I do not think Mejum is a goer. But there is another place where we can build a small storage, which is right where it needs to be. It is east of Narrandera. The river runs through a natural fold in the earth's crust there that many years ago formed a lake. In fact, that is the reason you have that gigantic aquifer out of there. That is where it burst out. If we build a storage there, and let us say it is only 80, 90 or 1,000 megalitres—I would anticipate it would be more than that but let us call it 100,000 megalitres—that would be full at the beginning of the irrigation season in most years, simply from the run-in from all those creeks I have been talking about.

The minute the farmers start ordering water, the first water you use is that water because it is close. You particularly use it when—and this happens in, like, the irrigation season just past—there are a number of farms near my own, and I am not talking about a few but hundreds, that totally run out of water for four or five days. They misjudge the volume of water they need. It suddenly gets hot, and the rice needs water and they have run out of water. If we have storage there, in such a situation we would draw down that water. The next time there is a thunderstorm and we have 40,000 megalitres in the river—and most times it would be more than that—you put that 40,000 megalitres back in that storage.

CHAIR: That is a bit the way the Barron Box is operated, is it not—a similar sort of process?

Mr PIKE: Yes. Barron Box is on Mirrool Creek and it operates in a very similar fashion, and Barron Box is incredibly shallow—only two or three metres deep. No-one, even an environmentalist, could tell me that that is not an advantage to mankind and to the environment. Go out there and have a look.

CHAIR: We have.

The Hon. Dr PETER PHELPS: We did go out there.

Mr PIKE: There are about 90 species of waterbirds there, for goodness' sake. I used to shoot ducks there, by the way, but do not tell them.

CHAIR: You just did. It is on the public record.

Mr PIKE: The greenies will be after me tomorrow.

Mr IBBOTSON: You mean they are not already?

Mr PIKE: All of these things are plus, plus, plus. For a minute I just want to come back to the environmental flows. In the whole of the Murray-Darling Basin, there are only two places where we can release water from a dam and put water out on the land. One is above the Barmah choke on the Murray. The other is the Macquarie Marshes on the Macquarie. Nowhere else anywhere in the system, unless you want to bring in the dam busters, can we release water out of a dam and put water over the banks, as my friend here pointed out earlier. Why are we releasing this water? I would like you to come with me and we will go down to the Barmah Forest. We will drive into the middle of it. What I will show you is several hundred hectares of dead river red gums. They are stone motherless dead.

The Hon. Dr PETER PHELPS: We have been there too.

Mr PIKE: Okay, so I do not need to say another word. You know what killed them?

CHAIR: Water.

Mr PIKE: It was not a shortage of water. It was water.

The Hon. Dr PETER PHELPS: Over-watered.

Mr PIKE: What are they trying to do now? They are trying to kill the ones on the north side of the river because they are reacting to—oh, what can I call it?—city greenies, for want of a better term. It is nonsense.

CHAIR: As opposed to the way the Forestry Commission used to water those forests.

Mr PIKE: Exactly.

CHAIR: Which is exactly what Mr Ibbotson was talking about before—watering them when they need water.

Mr PIKE: You and I both have a friend who is a fourth generation red gum forester. Go and talk to that gentleman.

The Hon. Dr PETER PHELPS: I believe we have done that as well.

Mr PIKE: Okay. I do not need to say another word.

CHAIR: Mr Ibbotson?

Mr IBBOTSON: Ron was talking about the Snowy having to supply the power. We need to get away from the wind farm-solar power stuff that people are trying to build to replace all the power stations. I will cite a

very simple case on the real story about solar and wind power. Germany has the largest solar installation in the world. In the three months of last winter, which they have just gone through, they produced less than 1 per cent of the rated capacity from those solar panels. That was for the whole of the winter. If we go across to England, which has 32,000 wind farm installations sitting around, during the whole winter they produced less than 8 per cent of the rated capacity of those wind farms.

The normal life of a wind farm is considered to be approximately 25 years. They are actually finding that it is probably 15 years and may be less. You can look at it this way. If you own a helicopter, the blades have to remain in perfect balance for it to be able to keep operating. If you own a little Harris helicopter and go flying around, you have to replace the blades, whether you like it or not, every 2,500 hours of operation. When you get big 60-metre blades roaring around, they say, "Oh, they are going slowly", except that the tip of the blade is going at approximately 200 kilometres an hour. For it to be suggested they will last for 25 years is absolute nonsense. This is why some of the wind farm towers are disintegrating. It is because the blades get out of balance. It is very hard to rebalance them. We need to get away from that and get back to maybe drilling a lit bit of gas in New South Wales.

Mr PIKE: Do you want us to get real controversial?

The Hon. PAUL GREEN: This is a water inquiry.

Mr IBBOTSON: And a little bit more coal and then we would not have to use the hydro power for just providing everyday power. That could really be used for peak power which is what it was designed for.

CHAIR: We are out of time. This is the final hearing of this inquiry and it is proposed that the committee's report will be tabled before the end of the financial year.

Mr PIKE: Can I just make a very quick closing statement?

CHAIR: Yes.

Mr PIKE: I am going back to where I started. You have my greatest admiration for the work you are doing and the thoroughness with which you are doing it. I think history is repeating itself. New South Wales was absolutely destroyed economically in every way in the droughts of the 1840s and 1860s. The very first royal commission that was ever held in New South Wales, do you know what it was? The adequacy of water storage.

CHAIR: That led to the formation of the Water Conservation and Irrigation Commission, as I recall.

Mr PIKE: Yes, 1884. That commission recommended that we build some dams. The legislators were just as slow back then as they are now. They needed another drought before they built Burrinjuck. They started Burrinjuck in 1907. Before it was finished the State was plunged back into drought. It was fairly short, it was from 1909 to 1916. In the summer of 1914 and 1915 the Macquarie, the Lachlan, the Murray and the Goulburn River in Victoria all ran bone dry. There was no water in them. There was no water in the bottom of the Murray. Guess what? Burrinjuck, although not finished, was still storing water. The Murrumbidgee River was kept flowing from Burrinjuck dam to Balranald. In the summers of 1914 and 1915 there was a train going from Leeton to every day and it was fresh fruit and vegetables and the dairy products from there that kept the city in food. We had the beginning of the food bowl of Australia.

What happened straight after that? Legislators very quickly realised what had to be done. They build Eildon, Hume and Wyangala in that order. Since those four dams have been built we have developed thriving rural communities. We have developed the food bowl of Australia. The politician who stands head and shoulders above every other politician in relation to water is a gentleman from Western Australia by the name of Nelson Lemmon. He was the many who, against all odds, took on the State Government, the Victorian Government, the *Telegraph* owned by the Packer family, Robert Gordon Menzies and he pushed through the Snowy scheme. The other politicians took all the credit down the road. Gentlemen, which one of you is going to be this generation's Nelson Lemmon? The ball is in your court.

(The witnesses withdrew)

(The Committee adjourned at 12.34 p.m.)

