



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

**HOUSE OF  
REPRESENTATIVES**

STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND  
FORESTRY

**Reference: Future water supplies for Australia's rural industries and communities**

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**HOUSE OF REPRESENTATIVES**  
**STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND FORESTRY**  
**Wednesday, 26 November 2003**

**Members:** Mrs Elson (*Chair*), Mr Adams (*Deputy Chair*), Mr Forrest, Mrs Gash, Mrs Ley, Mr Schultz, Mr Secker, Mr Sidebottom, Mr Windsor and Mr Zahra

**Members in attendance:** Mr Adams, Mrs Elson, Mrs Ley, Mr Secker, Mr Sidebottom and Mr Windsor

**Terms of reference for the inquiry:**

To inquire into and report on:

The provision of future water supplies for Australia's rural industries and communities, particularly:

- The role of the Commonwealth in ensuring adequate and sustainable supply of water in rural and regional Australia.
- Commonwealth policies and programs in rural and regional Australia that could underpin stability of storage and supply of water for domestic consumption and other purposes.
- The effect of Commonwealth policies and programs on current and future water use in rural Australia.
- Commonwealth policies and programs that could address and balance the competing demands on water resources.
- The adequacy of scientific research on the approaches required for adaptation to climate variability and better weather prediction, including the reliability of forecasting systems and capacity to provide specialist forecasts.

**WITNESSES**

**BLACKMORE, Dr Donald John, Chief Executive, Murray-Darling Basin Commission..... 723**

**CLOSE, Mr Andrew, Manager, Water Resources Group, Murray-Darling Basin Commission..... 723**



**Committee met at 5.15 p.m.**

**BLACKMORE, Dr Donald John, Chief Executive, Murray-Darling Basin Commission**

**CLOSE, Mr Andrew, Manager, Water Resources Group, Murray-Darling Basin Commission**

**CHAIR**—I declare open this public hearing of the House of Representatives Standing Committee on Agriculture, Fisheries and Forestry in its inquiry into future water supplies for Australia's rural industries and communities. Today's hearing will be the last for the inquiry. The committee is now moving to finalise its deliberations and prepare a report for tabling in the House early next year. I thank you very much for appearing before our committee. Although the committee does not require you to give evidence under oath, I should advise you both that these hearings are formal proceedings of the parliament and consequently they warrant the same respect as proceedings of the House itself. I remind witnesses that giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Do you wish to make a brief statement in relation to your submission before we ask a few questions? I thank you for bearing with us today and coming back a second time. We found your first evidence quite interesting. We look forward to moving on and asking a few more questions.

**Dr Blackmore**—Thank you very much for that and for having us back. We are really pleased to be here because it is a very exciting time in terms of water management and the opportunities that are being presented to communities as, I suppose, we go about rebalancing the way we think about the future. Firstly, I have some information that I would like to put on the table. I do not know how I do that formally. There has been some feedback to us about the previous material we have provided, where there are a couple of elements of confusion. I would like to clarify them if I could, and I will do that in a moment. We have also prepared a little Murray-Darling water resources facts sheet, which we will put out in the public arena, because there is a lot of confusion about how numbers are being used. If it is okay, I will just explain a little of the overarching material that is in it.

Lastly, I would like to briefly explain the Ministerial Council's decision and maybe give you a brief insight into the way that that might roll out. Some of it rests within the national water initiative and the other rests within the responsibility of the council. So how that family will go together in the course of the next six months is pretty important. I think we should scan how water would be used for the environment. We did discuss briefly last time water recovery and issues around that which were causing concern in rural communities. Would it be okay to make that brief presentation?

**CHAIR**—Yes.

**Dr Blackmore**—In the report I submitted the last time I was here, there is a statement that says that the audit report of 1995 indicated that 80 per cent of the available flow in the basin's rivers was being diverted for offstream use. That is in fact incorrect, so I need to correct that because the audit report does not state that. I do not know how that got through my processes, but it did. A correct statement to replace that would be the statement that appears at paragraph 3.1, which reads:

The audit report (MDBC/MC 1995) indicated that the median annual flow from the basin to the sea had been reduced by over 70%, and that if the existing management regimes were maintained, average diversions would increase by a further 14.5 per cent if all existing water entitlements were fully developed.

That is the correction I would like to put before you.

**CHAIR**—We need to approve the proposed amendment to that submission.

**Mr SIDEBOTTOM**—I move that the committee approve the amendment.

**CHAIR**—There being no objection, it is so ordered.

**Dr Blackmore**—There was confusion around it. Having got some feedback from a lot of folk at public meetings, we then went to the trouble of preparing a small fact sheet. People had been debating things like average flows and median flows and why we switch between talking in averages and then talking about the median, the flow you get 50 per cent of the time. So we prepared a little facts sheet that I think illuminates that as an issue. I will pick two or three of the key points in it for you and just lay it on the table. Most of the data has references showing where it came from, such as the land and water audit, modelling and work with CRES, CSIRO and the like.

In the basin, about 508,000 gegalitres a year of water falls as rainfall. Less than five per cent of that water turns up in stream flow. We get a bit over 23,000 gegalitres into our rivers. The rest of it services crops, evaporates, goes to ground water or whatever. So the amount of water that is available for discretionary use in an arid zone is a very small part of the water that actually enters this basin as rainfall. That is quite unique. It is really a very arid zone. It is an arid zone outcome and that is why water in this basin is clearly so precious in the way we use it.

We have also indicated the issues around interbasin transfers. This basin has three interbasin transfers that come into it. The two main ones are the Snowy River and the Glenelg River. So the Snowy goes into the Murray and Murrumbidgee and the Glenelg River goes into the Wimmera River. There is a small one on the Loddon River, which just crosses the divide. We have not put it in here because it does not include very much water.

They are the points I wanted to make. If you look at all of that and at what has happened under natural conditions, you will see that about 54 per cent of the water in the basin that got into streams would have gone to the sea under natural conditions. So out of all the water that got into a river, 54 per cent would have got to the sea. So 46 per cent of that water was used just running the rivers and meeting the wetlands and other requirements.

Under current conditions and including the interbasin transfer of 1,200 gegalitres, we are now down to 21 per cent of the water getting to the sea. So the rest of it is used in off-river diversions. The amount that is consumed by our wetlands, floodplains and the like has dropped dramatically from nearly 11,000 gegalitres to approaching 7,000 gegalitres. So that is a lot of the reason why we start to see stresses in our system and blue-green algal problems and all the other things that we are trying to deal with as a community. I do not know quite how you will use it. We will put this on our web site because it is important and I am happy to submit it to you.



**Mr WINDSOR**—That means 54 per cent that is extracted in some form or another is diverted? Is that the way we do the numbers?

**Dr Blackmore**—It is—

**Mr WINDSOR**—About 46 per cent would still be there to run it.

**Dr Blackmore**—Well, how much is diverted is 11,500 gigalitres out of a total inflow of 23,580 plus 1,200 gigalitres. I have not quite done the arithmetic, but 46 per cent of the water is—

**Mr WINDSOR**—Under natural conditions, you would need 46 per cent to run the river.

**Dr Blackmore**—Yes. We use much less than that now.

**Mr Close**—You currently have water use coming off water that used to be consumed by the wetlands and by the floodplains.

**Mr WINDSOR**—I am just wondering how your maths stacks up. You are saying 21 per cent gets to the sea now whereas 54 per cent would have gone under natural conditions?

**Dr Blackmore**—That is correct.

**Mr SECKER**—Is that pre locks?

**Dr Blackmore**—Pre everything. It is the best we can estimate with no development.

**CHAIR**—Can I get a member to move that the submission be accepted and authorised for publication?

**Mr ADAMS**—I so move.

**CHAIR**—Thank you.

**Dr Blackmore**—I think it is better to go through it. That is exactly the problem we are trying to overcome by just sitting down and working through each of the columns of numbers, because it includes all the ground water extraction numbers as well. So as we audit them and put them in the public arena, all of these are published in different forms. I hope this is a bit more coherent..

I will put before you now the council decision of two weeks ago on Friday which looked at whether they were prepared to make a first-step decision and go as far as our council is authorised to go. There is another process running with the Council of Australian Governments which at the end of the day we will need to confirm, change or amend. But what our council has decided now is to take an approach, after a huge amount of community feedback, whereby we concentrate on ecological assets, including the River Murray channel. The council have agreed that there will be six of them that they will concentrate on. By concentrating on them, you will deliver other benefits as well. They felt it was very important to do that because they could then

talk to the community about tangible, real things that the community could see and understand their relationship with. So we have done that.

We cannot protect everything on this, and I will just run through that. I will run through how we will go about it. They have based this on water recovery of about 500 gigalitres of new water. That is based on how much money is available, which is about \$500 million. That is a COAG decision. But assuming that that goes to water recovery, that gels. So the system is bounded by that scale of investment to 500 gigalitres. They have also identified that we will try to focus on getting that water through efficiency dividends as the primary way of doing it, but recognising at the end of the day there is a limit to it. Continuing to invest in efficiency dividends becomes expensive and there needs to be a way to enter the market should it become necessary. They have made a resolution around that. So we will concentrate on efficiency in the first instance.

I will just dive straight into a little presentation that will make it easier to go through rather than ramble on. The ecological assets are Barmah-Millewa and Gunbower. The Victorians asked for Hattah Lakes to be included, and there was quite a debate about that. They agreed to put that in. Hattah Lakes does not need much more water. They need access to money for structures to use the water that is available for those lakes much more effectively. You have a complex on the New South Wales-South Australian-Victorian border, the Chowilla and Lindsay River complex, which is a huge wetland complex. Part of it is in national park and part of it is managed nature conservation and dual grazing for nature conservation outcomes. You clearly have the Coorong at the bottom, which is an incredibly important area. So they are the five ecological assets, and the channel is the sixth one.

**Mr SIDEBOTTOM**—Where is the channel?

**Dr Blackmore**—It is the black area from Hume to the sea, so it is that 2,500 kilometres of the River Murray channel.

**Mr SECKER**—You are talking about the whole Murray?

**Dr Blackmore**—It is the whole river channel. We will attempt to target things that we can actually do better in the channel, so there are a whole lot of issues with erosion where we run at constant levels. We will start to follow some pretty sound ecological advice and change the way we operate our systems to do that.

The science that has underpinned this is now in the public arena and will continue to be refined. I think in terms of Australian and world standards it has been an extraordinary effort by the scientists and they are to be congratulated. It is an incredibly difficult issue, but they have repeatable science, where you can now go and find the decision point and the knowledge base for 3,100 knowledge fields. So if anybody says the science needs to be reviewed, they can work it out. If they are uncomfortable with it, we can invest to improve that. So all of that is transparent and you can get access to the whole lot of that. I have a video, but I will not bore you with it unless you really want to see it. There is a bit of an oversight of each of these sites. I do not know how much feel you have for them. It runs for about three or four minutes.

**Mr ADAMS**—That is okay. Hit the button.

*A PowerPoint presentation was then given—*

**Dr Blackmore**—That is a good question—whether I can make it work. This is the Barmah-Millewa. This is the channel. It is about 70,000 hectares and about 70 kilometres of channels. The channel capacity is about 11,000 megalitres a day. It controls the whole River Murray. As you can see, it is a channel that is cut in the bottom of a lake, so it is not a mature river. This controls the whole performance of the river downstream for the next nearly 1,500 kilometres. It is a fantastic community asset in terms of what it produces.

**Mr ADAMS**—And is that the choke?

**Dr Blackmore**—Yes, this is the choke. You can see here the river winds around on itself. It is a very small river compared to what you would see in the River Murray if you looked at other areas. You will see that a little later. We have done a huge amount of work in here. There are Ramsar wetlands. We have got three million—

**Mr SECKER**—Where is this? This is at Barmah?

**Dr Blackmore**—This is at Barmah, just upstream of Echuca. This is the Gunbower-Perricoota forest. Perricoota is in New South Wales and Gunbower is in Victoria. Perricoota forest has just been proclaimed as a Ramsar wetland. There are fantastic values through there. I will explain the combination of works and water in a little while. You can see the nature of the wetland complexes and forest. In a moment, you will see its relationship with the rice industry, which abuts this forest. That is the rice industry up through there. It is a very important agricultural area as well as an important natural asset for the region. We can do a lot to maintain most of those values, and we will, out of this package. So we will move out of this and go to an area that is going to be much more difficult to manage.

These two forests in the upper part of the basin are ones in which we can really make a difference. This is just over the South Australian border. This is very difficult to maintain because the 64 dams and all the rest of it have taken out much of that fluctuation. You can see it is very arid. You can see it is a very salty area. There are dying trees and all the rest of it.

**Mr SECKER**—Is it actually going to cause salt problems for the river by working on what we are going to do at Chowilla?

**Dr Blackmore**—Yes. But if we do not work on it, we will leave a bigger legacy. I will come back and explain that when I finish the video, if you want me to explain why that will be so. This floodplain used to be connected to the river about every three years. It is now every 11 years. What happens is that more and more salt builds up. This is an area that is highly salinised. I do not know the salinity of it, and I do not know what it is in this slide, but when I was out there it was about 1½ times seawater in that lagoon. Every time you get a flood, that comes out. But it is an area that is sitting on top of the water table and it is a very difficult area to manage.

We have pumped over one million cubic metres of sand in the Murray mouth and spent many millions of dollars, and we are continuing to do so. We have met our objective to reconnect the sea to the Coorong, so that is all working. There is a dredge. You can see the dredge working away there, beavering away. We will probably maintain these dredges. We do not expect to have

any water at this site under any conditions until September next year. We will continue to try to balance this. It is currently costing about \$110,000 a week to keep this open. What we have to do is keep this intertidal area viable because that is where the scientists tell us the energy in the system runs and the migratory birds and all the rest of it live. So if we let it become just a lagoon, it will become far less valuable in terms of habitat.

I do not have one on Hattah because the ministers agreed to include that on the day, as is their wont. I have not had a chance to go back and get somebody to fly over Hattah. But Hattah is a pretty impressive area, for those that have been there.

What we have done now and what we will be taking out to the community is what we are trying to achieve at each of these sites. In an area like Barmah-Millewa—and it is in these large documents, which you may or may not want—we want healthy vegetation for about 55 per cent of the area and successful breeding of colonial water birds three years in 10. That means we have to leave water in that system for long enough because those birds abandon their young as soon as the water goes away. They only live for 11 years or so. If you miss out on those breeding events, the population just crashes. So you have to somehow or other manipulate a sufficient opportunity; otherwise we give away this particular aspect of our environment. They are choices that people will make, but they are important.

Gunbower-Perricoota is pretty important. We can get the majority of its Ramsar values back, certainly. We can have 30 per cent of the river red gums healthy and of very high site quality in terms of red gums. If you go out there now, you will see red gums. But red gums are not red gums. What happens in these forests is that they change in character very slowly as their health declines over time. So you will go out there and see trees and everybody will say, 'That's okay,' but if you go out there 20 years later, they will be of an absolutely different composition. The issue is the health that you are trying to maintain in this system. We cannot maintain 100 per cent of this system—we just do not have the resources to do that—but we can make a pretty good stab at 30 per cent of it. As you saw earlier, there are large wetland complexes that are now only partly connected to the river. We will improve that. That will give native fish an advantage over introduced fish because they want to breed on the floodplains. So we will reintroduce a bit of that.

Chowilla is much more difficult. In Chowilla, we will have a combination of water and works. That will require us to pump at least some of the water for some of the time. We cannot generate sufficient height in our river to flood it. We can only envisage getting 20 per cent of the original black box vegetation back out of this proposal. We can do a lot in the Lindsay-Wallpolla area, which is on the Victorian side, because it is far less impacted. It is slightly higher and far less impacted. We can deliver very significant improvements.

We will keep the Murray mouth open with water most of the time. But for probably one or two years in 10, we will continue to have to dredge. That is part of the plan—to have dredging available. We will certainly enhance all of those other values. There are a lot of things about the river channel. It depends on where you are in the river channel. This is just a little snapshot of some of the things we can do by active management.

I want to move on from that. That is just a tiny snapshot. To deliver all of these things requires us to marshal capital. The governments have indicated a seven-year program of \$150 million

within the commission budget to build the bricks and mortar infrastructure to make this water useful. It is not only this water that might come out of the national water initiative; it is the existing water that we have to make more valuable. That means things like fish ladders. I could encourage everybody to go out to Lock 8, where we have just finished one, and have a look at that. It is a fantastic thing to see. We have designed it with the fish biologists and others. We even got a small rainbow trout swimming up the fish ladder the other day. It is starting to worry me why a rainbow trout would be down near the South Australian border.

What I want to talk about now very briefly is how we effectively manage the government's trust—I think that is the way to describe it—in environmental management. We have to make sure that we have arrangements which cement trust in the community because at the moment that is fractured, and it is fractured for a whole lot of reasons. I have to commend the Council of Australian Governments for trying to bring that back on track. It was pretty untidy until then. So what we have to do is work out how we will source water in ways that provide agricultural benefits and leave a better system out there.

I will not go into that, but there has to be a stable arrangement to do that. If it is not stable, you will not have the trust of the community to bring their private capital to the table. My personal view is that this is the No. 1 most important thing in terms of trust and investment strategies. Otherwise what will happen is that much more of the cost will be borne by government because people will not trust the institutions that deliver change. So that needs to be thought through.

The water that is acquired by whatever means will go into an environmental water account. We are busy. Council has asked us to set that up. That will just be an asset held by the governments, the same as Dartmouth Dam or Hume. The water will still be for New South Wales or whatever, but the control and management of it will sit within this account and will be used for the environment. We will have an environmental manager that will make decisions, with community consultation and all the rest of it, on how that water is used on a day-to-day, minute-by-minute basis. It is not something you can plan for. You have to match it up with floods and whatever.

Very briefly, I will provide a little comfort to understand how that might happen. I will look at our operations from 1995 to 2003, which is a period that most of us can remember; even at my age, I still remember it. What would happen if we had this water and we were actively operating it? I will run through this very quickly. This was done before we had six assets. We have five assets here. We have said that we have recovered 500 gegalitres of water. That is just notional. We have put that in. We have said it is available each year. It will go up and down with seasonal allocations in each of the states. We have not given in this simulation the character of whether it came out of New South Wales or Victoria, simply because we did not want to cause another fight. So we have just left it as 500 gegalitres of real water sitting in the system for the purposes of this demonstration.

We are going to maximise environmental dividends. We are not going to change the reliability to irrigators, so the water that is left will have its original character maintained and so on. The water will be available to irrigators in dry years if any of those occur, so we will just see. Forget this table other than to say this is just a balance sheet. It has five of the six assets. I have not put Hattah in there simply because it was done before Hattah got on the account. It just says how we would account. Much of the water that goes into these areas comes out again. So we put water

into Barmah-Millewa. It does not all stay there. When the river drops, the water drains back out, so its consumption is only a very small amount of the water that is needed to flood it in the first place.

Let me take you through this. We will start with an account with 500 gigalitres in the first year. We will say, 'How will we use that water?' We will put some water into the Gunbower-Koondrook area, which is consumed. This is just to keep those wetlands alive. There are 25,000 megalitres or 25 gigalitres. So in that year the only opportunity we really had was to put that water into the forest. At the end of the year, we still had 475 gigalitres sitting in our dams. It might be on the Murrumbidgee or it might be in the Murray, but we would have accounted for it in a dam somewhere.

This just says there are four opportunities to do things, so we just roll through them. In the next year, we can take that water we had and we can target a release of 800,000 megalitres. There was a flood on the Ovens River, so we have released a lot of water to supplement a flood, of which most of it, 700 gigalitres, is returned and about 100 gigalitres was used by the forest. So that water then goes on to Koondrook. Again, we have put 400 gigalitres of that water into those forest systems. Our estimate at the moment is that 325 gigalitres will go back into the system and it will consume 75. It goes into the Chowilla floodplain. We have restored some of that water in Lake Victoria and then we have released it again into the Chowilla area and we have supplemented it with some pumping.

This is the default position. After all that has occurred, the laws of gravity work and what has not been re-regulated ends up at the Murray mouth. In this case, about 600 gigalitres turns up there. When you put all that in an account like this, you find that you have used all the water available. You have used it in the spring so it has not occupied space in the dam that the water for irrigators might have. It has married it with other opportunities. So we will just go through all of it.

I am not going to take you through the rest of it. I just want to illustrate that when you do a simulation like this, you can see that in those eight years there are actually only three years where you have massive opportunities for significant environmental enhancement. In three of the years, water would be either sold or loaned back to the irrigators. As we speak right now, we are loaning the Barmah water for this year from New South Wales back to irrigators in your electorate because the spring has passed and there are no opportunities in which that water could be effectively used. So it has been loaned and not sold. But the public policy decision for governments is whether they are going to sell it—a market mechanism—or whether they are going to loan it. That is something our ministers are now worrying about.

What would happen is that it would be loaned or sold on the basis that there would be a net environmental benefit. But it is a highly flexible system, as you can see. So it does not take water out in the low years. In the first two years where we have not indicated water sold or loaned, the allocations were quite generous to everybody. So there would not be anybody too interested in getting it.

So there we go. We have got the largest experiment in environmental management the country has ever seen, which I think will challenge us all as it is implemented. But I think we have an

opportunity now with the capital available from government to make everybody a winner. That is certainly what we are trying to achieve. So that is the very brief presentation. Thank you.

**CHAIR**—Thank you very much for that. I will ask the committee members if they would like to ask questions now.

**Mr SECKER**—Thank you, Madam Chair. The pictures you had of the Barmah were of forest. You actually had some very sharp angles in the river. Probably in time many of them would turn into billabongs and you would have a straight through cut. Are we looking to do that mechanically or will we just let that happen naturally?

**Dr Blackmore**—We certainly have no intentions of doing it mechanically because if we changed the gradient in that river rapidly, I do not think we would understand the full implications of what would happen. It would start to increase the velocity and the scour. We have done those sorts of interventions before and we have paid quite a price for putting enthusiasm in front of understanding.

**Mr SECKER**—I should have congratulated you on the work you have done. You have done a fantastic lot with the river over many years. I think many of us would be sorry that you are retiring. We hope in some way we will not lose that knowledge and that you will still have some involvement along the way.

**Dr Blackmore**—Thank you.

**Mr SECKER**—The other thing I was going to talk about was Lake Alexandrina. I continually get complaints from—and I will be a bit of a devil's advocate here—some people saying we should not be putting all this water down Lake Alexandrina because it all evaporates. They say we should be putting a weir there or something and then pumping it into the river and then pumping it to the irrigators. Do you have a view on that?

**Dr Blackmore**—This is an area that comes up. I think Sussan Ley has been at many meetings where folks up the river have said, 'A weir at Wellington would be sensible.' Andrew has been modelling the river for longer than I care to think and has done the numbers on this. He might correct me on the exact number. One of the issues you have is that this water is going to get to the lower lakes one way or another. In fact, you want the water to go through the river channel in South Australia. Otherwise you have a serious problem with salinity. So the question is whether you can improve the efficiency of the lower lakes and consume the water in that area, which is a South Australian issue of whether it is prepared to trade off the lakes for increased consumption. It is not a significant issue for the upper basin community. Even though the upper basin community believes that you can suddenly take 600 gigalitres of evaporation—is that right, Andrew?

**Mr Close**—It is about 800.

**Dr Blackmore**—About 800 gigalitres of evaporation—

**Mr SECKER**—On the lake?

**Dr Blackmore**—On the lake, you suddenly say, ‘We’re going to take most of that because we’re just going to abandon that lake.’ We have to be able to store that somewhere in another storage for that to be effectively available to people. When you do the sums on it, you find that you cannot store it because your storages are full, particularly in the lower lakes. This year it might seem quite strange because there is lots of airspace. I did not bring the number with me, Andrew, but can you remember what the safe yield would be from a weir at Wellington or in the order of it? I do not think we have to be precisely accurate.

**Mr Close**—In terms of the actual reduction in evaporation on the lake, if you put a weir in at Wellington and you let the lake drop to sea level, you only save about 50 ggalitres of evaporation a year. You live with the lakes at sea level and all of the recreation and everything that is operated on those lakes and all the irrigation would have to be rerouted. So you are not talking about a big saving.

**Mr SECKER**—Because the evaporation would just occur up the river?

**Mr Close**—Yes. The evaporation would occur off the lake anyway, so the actual extra water you would have going out the mouth would only be a small amount because the lake would not be spreading out quite as far.

**Mr SECKER**—And you damage a local ecosystem and fish breeding and evaporation?

**Dr Blackmore**—There is another misconception, which is that the lake was in fact an estuary and therefore the lake was seawater. The reality is that—I think my arithmetic is right—the average flow at the mouth under natural conditions was about 40,000 megalitres per day. So you can do the sums while we are talking, Andrew, but it is about 14,000 ggalitres divided by 365.

**Mr Close**—That is about right.

**Dr Blackmore**—Thank you, Andrew. We are beginning to become quite a team. So 40,000 megalitres a day on average, and very few periods in the last 100 years that we had low flows. What happens is that the fresh water fronts right down at the mouth. So the lake was not an estuary in the classical sense of salt water coming right back. Rarely, and on occasions, you would get that front coming back up, but it would be quite rare. All the fringing vegetation around that lake from the geomorphologists and people looking at it shows that it has been historically fresh. So it would be a massive change to do it, but we could do it if people wanted it done.

**Mr SECKER**—But the overall saving is 50 ggalitres.

**Dr Blackmore**—On evaporation. But if we tried to re-regulate it and we just abandoned the whole lot, you would have to then deal with all the dairy farmers. You have to deal with Goolwa and Langhorne Creek and you have massive pipelines to build. It is not just a weir.

**Mr SECKER**—The cost of it is not very good.

**Dr Blackmore**—It is certainly not high on our agenda.



**Mr ADAMS**—Professor Cullen told the committee that he thought if the Murray-Darling Basin Commission had implemented the NAPs and the Natural Heritage Trust programs the basin would have been much greater and we would have got a lot more out of those programs. What do you think of his assessment?

**Dr Blackmore**—That is a career limiting question!

**Mr ADAMS**—It is pretty strong.

**Dr Blackmore**—And we are on the transcript, too.

**Mr WINDSOR**—If you get it wrong, you have to resign!

**Dr Blackmore**—I think there is a lot of strength in a multilateral program where the states are asked to sit down and work out from this basin how they best invest their capital for natural resource outcomes. We ran that program from the mid-1990s until 2001. Governments then elected that they did not want to run it that way. It was a highly successful program. In fact, it rated as the best program under all of the trust assessments. The reason it was a successful program was that those who were the beneficiaries, which were the states and the communities, negotiated the program. The states negotiated with themselves across state borders on where those resources would go. It was quite uncomfortable, but it did sort out where the priorities were in a much more open and transparent way. It had that merit. I think people would argue that the transaction costs with it could be a disadvantage.

If you set up a natural resource mini-parliament for the basin, which is what our ministerial council is, you have to ask whether you want to empower them to do those sorts of jobs. If you do, give them the task and let them run with it. I have not answered your question.

**Mr ADAMS**—I will have another go. The interim report of the scientific reference panel looked at the impact of three reference points—350 ggalitres, 750 ggalitres and 1,500 ggalitres. It suggested that 1,500 ggalitres was needed to achieve whole river improvement. How important is that whole river improvement? Is 500 ggalitres enough to improve the health of the river?

**Dr Blackmore**—I can only go on my judgment here. I have read that report very carefully. I have been working for many years to make sure the science was adequate to drive such a report. It is a community judgment. We can make a massive change with 500 ggalitres and the investment of capital. Our council is very considered in its response to this because they believe that this is a first-step decision. They will want to have evidence of what they have got out of that investment, as will the basin community. Can we make massive change? Absolutely. I think I have put it up on there, and if you go through this, you will find you are getting massive change. Is it enough? At the end of the day, in five years, we will sit down and ponder that. Hopefully, we will ponder it on the basis of having real life experience, real life monitoring.

I am putting together now with the scientific community the investment strategy for knowledge so we will not be sitting here struggling to get to the starting post. This is the largest experiment in environmental management ever undertaken on this continent. If we do not build a CRC around this investment, we are crazy. So we are working hard to do that. We will not be

sitting here saying, 'Hang on.' We have got the same level of uncertainty I think everybody in the room would have had coming in through the starting gate a year or even two years ago.

So my summary is that it is a fantastic start. It is about as big a bite as any of us can deliver. I mean that genuinely. The complexity in delivering this is the same as me having to build Dartmouth Dam in capital. Think about it: it is the largest dam in the continent and this is not small infrastructure. Intellectually, physically, this just does not come free of all of that. So this is about as big a bite as you can take. From the rural community's perspective, certainly my reflection of that is that they want to see real and tangible things. Those folks out there earn their crust working close to the land and they want to see and trust that there are things you are actually delivering. That is a trust that we want to deliver. So I am really positive about it. We now have an opportunity to learn and grow.

**Mr ADAMS**—And my last question is: do you feel confident that the 500 gigalitres will be there?

**Dr Blackmore**—I am extremely confident that 500 gigalitres of water is available by a properly structured intervention program worked in partnership with the community and private capital. So I am absolutely convinced about it. Look at the dairy industry. It has increased its economic production performance by 4.3 per cent every year for the last decade. All those industries have. So there is nothing to stop it. We are not going to suddenly stop dead, so it is a question of how you marshal resources and give people opportunities. This program, properly structured, can do that.

**Mr SIDEBOTTOM**—I wish you well in the future, too. I am just reading some of the press reports related to your impending resignation or retirement. They speak very, very highly of you. I was going to ask the question Dick has just put to you about the glass half full solution. I refer to a report in the *Age* in relation to Professor Gary Jones from the cooperative research centre for fresh water ecology. He was positive about the 500 gigalitres. It says:

In September he suggested that "some practical on-ground trials of generous environmental flows—set up with well-funded monitoring programs" be undertaken. In his interim report on the river, Professor Jones also argued that a 1,500 gigalitre allocation had the best chance of delivering "a healthy working River Murray system".

He talks about practical on-ground trials of generous environmental flows. I remember on 28 May at a hearing here that you said you did not like the term 'environmental flows' and you do not like to use the term because it is a currency which is not all that useful. Was Gary Jones not being useful? What does all that mean, and what do you mean by that?

**Dr Blackmore**—I was referring to the package of measures that are necessary to deliver environmental outcomes. Flows is one element of that package. We had all hung a lot on just using the flow analogy as the only one. Professor Jones and I are not far apart on this. It is just terminology, I think, more than anything else. What I am saying is that if you want an environmental dividend, you have to do five or six things. But the three most important are that you have to deliver water, you have to deliver the works to maximise it and you have to deliver the intellectual capacity to make sure that your choices are right. That is the research, monitoring and the day-to-day activities. You need to get those three things right as a package. I will not go

into analogies because they will come back to haunt me. I was going for the trifecta rather than just saying environmental flows by themselves.

Gary went on to refer to properly designed experiments, which is exactly what I am saying. You have all of those three things working. This is the biggest experiment we are ever going to run in this nation, in my judgment, in changing environmental management. In all the work I do around the world on river basins, I have not seen anything of this scale going forward. So I think we have an opportunity to grow. I think we have a massive opportunity to market these skills in all sorts of interesting places. It is actually a marketing edge for Australia in terms of the way we think.

In terms of agriculture—and I know it is part of the committee's title—we had representatives from the European Community last week looking at trying to understand environmental performance. They were interested in this because this is quite different from the regulatory approach that they are taking. You could start to think of how you could badge your products in a very positive way in a few years as we move down this path. So I see lots of positives in it.

**Mr WINDSOR**—Don, you made a statement that I thought was very true in the sense that for this to happen we are going to have to establish trust with a whole range of stakeholders. In terms of creating that trust, out of the 500 gicalitres, how much of that do you see as being water that you will have to take from the marketplace?

**Dr Blackmore**—This is a judgment and—

**Mr WINDSOR**—What process would you use to do that or would you advise be used so that we really do establish this trust with the community that in some cases will lose some of that water?

**Dr Blackmore**—My personal judgment, based on the vast amount of resources we have put out—but not out in the public arena, so I cannot quote a document—is that in the price that governments might be prepared to pay, 300 to 350 gicalitres of water is recoverable by strategic investment. That is fixing up some of the baggage of the past, pipelining stock and domestic systems and so on and cleaning up some channel systems which are pretty untidy. That is constrained by how long it will take to do. So what can you do in five years? Around 300 to 350 gicalitres. That leaves 150 gicalitres to stand in the market. We are currently trading on the annual market about 700 or 800 gicalitres and about 100 to 120 gicalitres on the permanent market. So that seems to be doable over five years if you design proper market instruments.

My paranoia—and I mean it is paranoia because I have been in the irrigation industry for 24 years, so that is where I come from and that is my experience as well as with large basins and all the rest of it—is that right now, if we were to enter the market in a willy-nilly way and not as an intelligent purchaser, we could be a predator. We have deep pockets; governments have deep pockets. The dairy industry is not actually clapping right now, for all sorts of reasons. Parts of the rice industry are struggling. They went from nine per cent year last year to a 40 per cent year this year. I do not know what the future looks like, but I know that I am going to roll over the reservoirs next year at a very low level, so we have a massive amount of uncertainty into next year as well.

What we are doing is working with people now to design some market mechanisms. We will be working with the industry to do that. Minister Truss has invited the industry to put a small group of senior industry advisers to work with our team, so we are certainly getting hand in glove on trying to come up with tender systems and the like which mean that we will not be a predator.

The worst thing that can happen, in my judgment, is that we end up driving the price of water up because of a lack of discipline in the way we enter the market. That might make a hell of a lot of people wealthier in the short term, but it means that our ability to adjust our industries using that instrument will be eroded. So we have to be very careful. I like what I see in the way that Adelaide entered the market recently when they hit their cap. They sat down and thought from the South Australian perspective what was a hazard to them and what was an opportunity.

They have taken out blocks of water and farms which they perceived to be a risk to their long-term future. I think they have treated those folks—it seems to be a voluntary process—pretty generously. So there are lots of ways to do it where, at the end of the day, you make people winners without distorting the market. I could bring over the chairman of our economics panel, Dennis Hussey. I know it is your last hearing. He and his team have been working on this for the last six months or so. They have an absolute focus on making sure that we are not a predator and we do not by our actions distort the market.

**Mr WINDSOR**—I have probably a more difficult question for you to answer. In terms of ground water systems in the Murray-Darling, and particularly those that are not only overallocated but overused, where do they fit into the \$500 million and the change process?

**Dr Blackmore**—The national water initiative will have to deal with that. I am sure that they were part of the thinking of governments when they went into it. You know the Gwydir and Namoi situation. There is a bit on the Murrumbidgee. There are another three or four of those systems sitting in the wings, just about to hit that as people in drought go to ground water. I think I said last time I was here that this is one of the issues we have to tackle. We have six issues that are really going to hurt us in water management. One of them is climate change. We will invest in really improving that. We have already got a contingent liability out of the bushfires now, for which we will pay a price over the next 20 years. The memory of it will go on for at least 40 years. That is already in the bank. It takes out of our system. Ninety per cent of the Dartmouth catchment was burnt, so we are going to pay a very high price when those tall eucalypts get back into their mature phase as they go through their growth phase. We are working on that at the moment.

We are overallocated on ground water. So there has to be a correction there. Otherwise folks will misuse their capital. Some of the money will obviously go to fixing that correction. You have farm dams. I do not know whether you folks have taken evidence on farm dams, but we are on a hiding to nothing on farm dams because they are iconic in terms of rural communities and they are needed for firefighting and all those important issues, but they are continuing to grow. Where is the limit in that? If you go around Canberra, as you fly in, you can see it. Unfortunately, they are grossly inefficient because they are shallow and whatever. At the end of the day, folks will need to sit down and have a bit of a think about farm dams as an issue.

**Mr WINDSOR**—I have one quick last question. Is Menindee Lakes in the reorganisation?

**Dr Blackmore**—There will be a package of things happen with Menindee Lakes.

**Ms LEY**—Don, I refer to the science behind the Living Murray initiative report, which was commissioned by Deniliquin's Murray Irrigation. I wonder how you rate the quality of the report and whether you think that valid concerns were raised by that report.

**Dr Blackmore**—I rate the scientist very highly. It comes out of an area where we have worked together in the past. I have nothing but respect for him. The report that he wrote actually dealt with the expert panel process and not the scientific reference panel process. So he actually did not report on the report that is now out there. What he reported on was history, which is important. His observations were one-off expert panel approaches to the science of these large rivers, which have huge flows in, which we all broadly support. So we know it when we started them. They are just a call to action issue. So what he has actually been critical of is the expert panel approach, which is not repeatable. You get a group of people together with the best skills available. Andrew has done it a couple of times. You can see one of the candidates here. At the end of the day, you get a snapshot but no predictive capacity, no modelling capacity. So we would agree with his observations. In fact, we could have written the same thing. So we are very supportive of what he has had to say about it.

I do not know where that takes us. If he had done a critique on the Jones report, that would have been a different story. In fact, we would actually welcome it. We had one international and one basin scientist do those critiques for us, so that report has been peer reviewed by people who have no interest in it. There were some modifications made, but they are very supportive of it. So we have gone to a lot of trouble to make sure we are not floating up something. You have to realise as well, as you do, that there have been over 67 scientists working on elements of it and there are 3,100 knowledge fields now in that report so that you can find where every bit of data came from. What we are not doing is the expert panel stuff, which just merges everybody's skills. This is what it looks like. You just cannot unravel it. In that report, you can go through every field, if you want to, and say, 'We don't believe this,' or 'There's not sufficient evidence in that,' or whatever. So I do not have any problems with that report. It did what it was intended to do.

**CHAIR**—I will interrupt for a minute before we go to further questions. Sid has just advised me that we are going to be having a division in the House soon. I would like to put on record, in case we have to leave and you cannot wait, my thanks and congratulations for the outstanding job you have done over the last 20 years regarding the health of the Murray-Darling basin. Sorry, Sussan, we will return to you in case you have some more questions.

**Ms LEY**—Thanks, Chair. I would certainly endorse those comments. Would you say, then, Don, that you are confident—this is probably an unfair question for someone who is not a scientist—of the science that underpins the Murray flow's assessment tool, and that there is scope in that tool to add all sorts of pieces of data but they are certainly not all there?

**Dr Blackmore**—Sussan, back in 1995, I was paranoid that we were dealing with massive change in river health when I was the deputy chair of the Land and Water Corporation investing your money, the Commonwealth's money, in land and water research. There was no repeatable process, basically, so we started decision support work with CSIRO and some universities

basically to make sure we put up in lights what we did not know so that when we were investing in research we could concentrate on filling those gaps. That has been a highly successful process.

The MFAT, the Murray flow assessment tool, is the son or daughter of that process. Is it complete? No, it is not complete. Things like the vegetation understandings are very good because we have a long history of understanding of red gum flooding cycles and black box flooding cycles. Water birds? How many people in Australia are working on water birds? The fact that we have only 30 per cent of our wetlands left in the basin means it is a pretty thin group. So do we have a complete understanding? The answer is no, we do not have a complete understanding. What happens is that when you go in there, you can find out where they are. You say, 'Hang on, what will we do about that?'

With algae, we have probably as good an understanding as anybody on earth. That is because after being a bit untidy in the Darling in 1991 we put the hammer down on algae and so we can pretty much tell you what will happen with algae. Fish? We are struggling with fish. Certainly with native fish and particularly the smaller native fish which no-one talks about but which are the dominant features of our rivers, we are a long way away from that. We have some understanding. So it is an incomplete picture. The real art form in this is whether it is sufficient, when you go through it, in terms of the evidence that you need to go forward. We are convinced it is sufficient. Is it perfect? The answer is no.

**Ms LEY**—But it is a decision support system, isn't it?

**Dr Blackmore**—Yes. And it is repeatable.

**Ms LEY**—Essentially, it cannot produce a whole lot more than what is actually put into the model.

**Dr Blackmore**—I do not know where this question is leading to. However, the reality is that what you have done is break the river up now into all its reaches. Within each of those reaches, you have analysed five different characteristics. You have put the evidence trail for those five different characteristics, which is everything you know about them. You have then run the models for 109 years and have the complete hydrologic record from the 1890s through. You have seen what happens to each of those indicators for each of those reaches in bulk. Individual scientists have gone out and calibrated their understanding of each of those characteristics. They are folks who have worked in those areas that can put their evidence fields in.

Am I confident that that is good? I am confident it is brilliant. Is it finished work and will we refine it? The answer is we have a long way to go. That is why I have been saying at the start that this is the largest experiment in environmental management this nation has ever seen. So we will refine those understandings and become smarter managers.

I will use the same analogy as for the dairy industry. I will not use the rice industry. If the dairy industry stopped still in 1990, it would be 43 per cent less productive than it is today. Why did it go forward? It went forward because we knew how to milk cows and grow grass but now we know how to do it better. In environmental management, that is exactly what we are going to do. The analogy works one on one. It is a production analogy—carbon, energy, water, production. So I do not know whether that helps or not, but it makes me feel better.

**Mr WINDSOR**—You should go into politics, Don.

**CHAIR**—Last time you appeared before the inquiry, you said that the phrase ‘environmental flows’ is not well understood. I must admit that, as chair of the committee, I, and probably the members too, often get asked what exactly an environmental flow is. Could you think of another term to use that would give a bit more understanding to the community?

**Dr Blackmore**—I think it is a very difficult question and I think it is a question for the colleague that raised it earlier. I do not quite know how you do it. There are 4,000 or 5,000 gegalitres of water left in rivers now, which is an environmental flow. What we are doing is supplementing it with additional water to give an increased environmental dividend. So which part is the environmental flow? It is the package of things that deliver environmental outcomes. My argument, I suppose, has been all the time that it is that package. So I do not have an answer to that which I think is helpful at the moment.

We have to set up an environmental water register. We cannot think of a smarter way. I must admit that after having a conversation with a lawyer who is writing about it for me today, he is struggling with the same thing: what does this mean? He understands what the water will be, but is that the right terminology? So we do not have better terminology, I am afraid.

**CHAIR**—Thank you. Are there any further questions that members want to ask? If not, we very much appreciate both you and Andrew appearing before us. We wish you well in the future, whatever endeavours you take on.

**Mr SIDEBOTTOM**—What are you doing, Don?

**Dr Blackmore**—That is a good question. I am retiring, but I want to have time to rebalance my life. I have spent 20 years working for six governments and I have not been able to do things I used to do. I have foster kids.

**Mr SECKER**—Do you want to have a houseboat on the river?

**Dr Blackmore**—I want to go back and do some work in charity—things I have been excluded from doing simply because there is no space left in my life. At my age, you do that. I want to do some things internationally.

Believe it or not, what we do here is world’s best practice in large basins. As I say, you guys get beaten up all the time, but I think we do not celebrate stable democracies quite often enough. I should take you on a trip with me some time to some of the other places that I go. It is pretty scary. I will give you one example. We had dinner with the new Iraqi minister for agriculture, or whatever his title is at the moment. The interpreter sitting next to me was a university professor who has left Iraq and is in England now. He said when he left in 1990 the salinity of the Tigris River was 500 milligrams per litre, which is pretty ordinary. When he got back, he found it is now averaging 1,000. How do they get out of this in a basin that is shared between Turkey and Syria? The 1,000 milligrams per litre just really reduces your options on where you go as a community. So this is happening all over the world. There is a bit of fun to be had, I think.

**CHAIR**—Even though you will be retiring, we will make sure you get a copy of our recommendations. We thank you for your contribution to our inquiry.

Resolved (on motion by **Mr Sidebottom**):

That this committee authorises publication of the proof transcript of the evidence given before it at public hearing this day.

**Committee adjourned at 6.19 p.m.**