



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

SENATE

ENVIRONMENT, COMMUNICATIONS, INFORMATION
TECHNOLOGY AND THE ARTS REFERENCES COMMITTEE

Reference: Extent and economic impact of salinity

FRIDAY, 14 OCTOBER 2005

SYDNEY

BY AUTHORITY OF THE SENATE

INTERNET

The Proof and Official Hansard transcripts of Senate committee hearings, some House of Representatives committee hearings and some joint committee hearings are available on the Internet. Some House of Representatives committees and some joint committees make available only Official Hansard transcripts.

The Internet address is: **<http://www.aph.gov.au/hansard>**

To search the parliamentary database, go to:
<http://parlinfoweb.aph.gov.au>

SENATE

ENVIRONMENT, COMMUNICATIONS, INFORMATION TECHNOLOGY AND THE ARTS

REFERENCES COMMITTEE

Friday, 14 October 2005

Members: Senator Bartlett (*Chair*), Senator Adams (*Deputy Chair*), Senators Conroy, Lundy, Ronaldson and Wortley

Substitute members: Senator Stephens for Senator Conroy and Senator Adams for Senator Ronaldson

Participating members: Senators Abetz, Adams, Allison, Boswell, Bob Brown, George Campbell, Carr, Chapman, Colbeck, Conroy, Coonan, Crossin, Eggleston, Chris Evans, Faulkner, Ferguson, Ferris, Fielding, Forshaw, Humphries, Joyce, Ludwig, Mason, McGauran, Milne, Moore, Nettle, O'Brien, Payne, Robert Ray, Siewert, Stephens, Watson and Webber

Senators in attendance: Senators Adams, Bartlett, Siewert, Webber and Wortley

Terms of reference for the inquiry:

To inquire into and report on:

An assessment of the long-term success of federal programs that seek to reduce the extent of and economic impact of salinity in the Australian environment, including:

- (a) whether goals of national programs to address salinity have been attained, including those stated in the National Action Plan for Salinity and Water Quality, National Heritage Trust and National Landcare programs;
- (b) the role that regional catchment management authorities are required to play in management of salinity-affected areas, and the legislative and financial support available to assist them in achieving national goals; and
- (c) what action has been taken as a result of recommendations made by the House of Representatives' Science and Innovation Committee's inquiry 'Science overcoming salinity: Coordinating and extending the science to address the nation's salinity problem', and how those recommendations may be furthered to assist land-holders, regional managers and affected communities to address and reduce the problems presented by salinity.

WITNESSES

| | |
|---|-----------|
| AL BAKRI, Dr Dhia, Senior Lecturer in Environmental Management, University of Sydney..... | 32 |
| CAMPBELL, Councillor George, Spokesperson on Natural Environment and Resources, Western Sydney Regional Organisation of Councils Ltd | 13 |
| COPELAND, Professor Les, Dean of Faculty, Agriculture, Food and Natural Resources, and Director, Centre for Salinity Assessment and Management, University of Sydney | 32 |
| DUNN, Mr Barry Wentworth, Director, Water For Australia Pty Ltd..... | 44 |
| FINGLAND, Mrs Sharon Ruth, Assistant Director, Western Sydney Regional Organisation of Councils Ltd..... | 13 |
| FISHBURN, Mr Geoff, Executive Director, Coastal, Rural and Regional Implementation and Catchment Management Authority Support, Department of Natural Resources | 1 |
| GASKELL, Mr Robin Fairbridge, Support Team Member, Water For Australia Pty Ltd | 44 |
| HERRON, Dr Natasha, Senior Natural Resource Officer, Department of Natural Resources | 1 |
| McGHIE, Ms Sian, Senior Natural Resource Officer, Urban Salinity, Department of Natural Resources | 1 |
| PAVAN, Mr Neville, Catchment Coordinator, Implementation, Hawkesbury-Nepean Catchment Management Authority | 59 |
| TRUMAN, Mr George Frederick, Catchment Officer, Projects (Salinity), Namoi Catchment Management Authority | 24 |
| VERNON, Ms Sharon Lynette, Program Manager, Hunter, Hunter-Central Rivers Catchment Management Authority | 50 |
| VERVOORT, Dr Rutger Willem, McCaughey Senior Lecturer, Hydrology and Catchment Management, Faculty of Agriculture, Food and Natural Resources, University of Sydney | 32 |

Committee met at 9.42 am

FISHBURN, Mr Geoff, Executive Director, Coastal, Rural and Regional Implementation and Catchment Management Authority Support, Department of Natural Resources

HERRON, Dr Natasha, Senior Natural Resource Officer, Department of Natural Resources

McGHIE, Ms Sian, Senior Natural Resource Officer, Urban Salinity, Department of Natural Resources

CHAIR (Senator Bartlett)—Welcome. I declare open the public hearing of the Senate Environment, Communications, Information Technology and the Arts References Committee into the extent and economic impact of salinity. The committee has been asked to inquire into the long-term success of federal programs that seek to reduce the extent and economic impact of salinity in the Australian environment. Amongst other matters, the committee has been asked to consider the support available to regional catchment management authorities to achieve national goals. The full terms of reference of the inquiry and submissions are available on the committee's web site or through the secretariat. For the benefit of all witnesses, I point out that the committee prefers all evidence to be given in public, but should you at any stage wish to give your evidence, part of your evidence or any specific answers in private, you may ask to do so and we will consider your request.

I welcome the witnesses representing the New South Wales Department of Natural Resources. Thank you for your time today. The committee has received the submission from the former Department of Infrastructure, Planning and Natural Resources as No. 22. Firstly, are there any amendments or alterations you want to make to the submission?

Mr Fishburn—No.

CHAIR—I formally remind witnesses that evidence given to the committee is protected by parliamentary privilege. That also means that the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. I also remind members of the committee that the Senate has resolved that departmental officers shall not be asked to give opinions on matters of policy and shall be given a reasonable opportunity to refer questions to superior officers or to a minister. I invite representatives from the department to make an opening statement, after which we will ask questions.

Mr Fishburn—Firstly, good morning. The Department of Natural Resources is pleased to be able to appear before the inquiry today. I note that this session of today's hearing addresses the New South Wales government's submission to the inquiry. In the year 2000, the New South Wales government recognised that the state faced a growing problem that had the potential to impact on the social, economic and environmental values of both rural and urban communities. The government developed and implemented the \$52 million innovative and far-reaching New South Wales Salinity Strategy. The strategy's actions were based on recommendations developed from community based stakeholder summits. The strategy accelerated knowledge acquisition of the causes of salinity in New South Wales, developed cutting edge, cost-effective models and decision support tools, built the capacity of agencies, local government and communities to

manage salinity and resulted in more targeted investment in on-ground management actions to mitigate salinity. One of the most far-reaching outcomes of the strategy has been the landscape approach to managing salinity, recognising the need to link actions at the property level with catchment-scale objectives.

After the New South Wales Salinity Strategy was announced, the Australian government announced the National Action Plan for Salinity and Water Quality. The New South Wales Salinity Strategy funding is a component of the matching funding for the NAP's \$198 million Australian government contribution. Over the last two years, New South Wales has continued to introduce major institutional reforms coupled with water reforms and native vegetation reforms. These reforms also support the objectives of the NAP. This includes introduction of farm-scale property vegetation plans to manage native vegetation and programs to encourage more efficient water use.

The catchment management authorities are implementing their three-year rolling investment strategies, which comprise the major proportion of a four-year allocation totalling \$436 million. All inland CMAs have salinity targets and several coastal CMAs are also implementing programs of salinity actions. CMAs have responsibility for the delivery of a number of key natural resource programs across New South Wales. The natural resource management reforms in New South Wales give clear legislative backing and financial support to CMAs to enable them to effectively manage regional salinity and help farmers manage on-farm salinity and develop strategies to remain productive. The Natural Resources Commission, a statutory body established in 2003, as well as setting a state-wide standard and state-wide targets, will also audit the CMAs' implementation of their investment strategies, thus providing government with independent advice about the performance of the implementation of investment programs. But, clearly, the on-ground resource condition changes sought from major natural resource investment programs are long-term goals. Initial monitoring and evaluation programs will focus on financial accountability and outputs monitoring. Strategies to monitor resource condition improvement are being upgraded.

Cost estimates for the impact of salinity at the time the New South Wales Salinity Strategy was launched are estimated at about \$130 million annually for Australia. This figure was very conservative and did not estimate social or ecological costs. The cost estimate for New South Wales was approximately \$1 million for every 5,000 hectares of viable land affected. The area of land affected in the Murray-Darling Basin was estimated to be between 120,000 and 174,000 hectares, with a prediction that this could rise to between two million and four million hectares. At the time, the extent of salinity outside the Murray-Darling Basin was unknown. A 1998 study of the cost of the impact of salinity in Wagga Wagga estimated that, in the absence of preventable measures, by 2030 the cost of salinity damage would have a net present value of approximately \$183 million. In the south-west of New South Wales alone, salinity is estimated to cause about \$9 million a year in damage to roads and highways. Work in 2001 on the costs of salinity was undertaken through the Murray-Darling Basin Commission of which New South Wales is a partner government. Figures presented for salinity impacts on dryland farming and households in the Central West, Lachlan and Murrumbidgee regions are: the Central West, \$35.5 million per annum; the Lachlan, \$38.6 million per annum; and the Murrumbidgee, \$38.3 million per annum.

Those figures may change as new information becomes available. But what is agreed is that costs are significant and they are rising. It is also becoming apparent that the financial impact on urban infrastructure, buildings and businesses will possibly be even greater than the cost impact on agriculture. These costs will impact on local government, domestic households, commercial and industrial businesses, state government agencies and public utilities. Impacts on the broader community and rural areas relate to lost production, costs of remedial action, declining soil quality and biodiversity, higher irrigation costs and the flow-on impacts to the regional economic base. Although the current drought has given us a reprieve, especially in those areas prone to high water tables, we know that with the next wet cycle high saline water tables and discharge scalding will again plague farmers and towns.

Finally, New South Wales supports the findings of the Senate inquiry in the report entitled *Science overcoming salinity: coordinating and extending the science to address the nation's salinity problem* and has made significant progress in implementing several of the recommendations, as outlined in our submission. Many of the recommendations were part of the New South Wales Salinity Strategy and are integral to the New South Wales government's salinity management initiatives.

I would like to give the committee some documents. One outlines the role and responsibilities of catchment management authorities in New South Wales; there is the Native Vegetation Reform Implementation Group final report, which recommended a number of reforms in the native vegetation area, including the establishment of CMAs; and there is the government's response to that final report.

Senator ADAMS—Do you have a map of the whole area? I am from Western Australia, which I know pretty well but—

Senator WEBBER—A number of us on the committee are from Western Australia.

Mr Fishburn—I can give you a map of New South Wales which gives the regional bodies' boundaries; in other words, the catchment management authorities' areas. I will supply additional maps out of session if you would like.

Senator ADAMS—It is just that we are not really that familiar with exactly where it all is.

Senator WEBBER—We are getting better.

Mr Fishburn—Will that suffice?

Senator ADAMS—That is fine.

Senator WORTLEY—Thank you for the in-depth overview of some of the impacts of salinity in New South Wales. I am from South Australia, so it was interesting to hear your opening statement and to read your submission. In your submission you discuss the Local Government Salinity Initiative, which provides training, education and technical support to councils to manage urban salinity. How responsive have the councils been to the LGSI, the Local Government Salinity Initiative? Has the department evaluated the success of that initiative at this stage?

Ms McGhie—I have brought some booklets for the committee. I have a copy of all the booklets in the LGSi series. There are 11 to date. Quite a few of them have been sent to South Australia and the councils there. I suppose I am a bit biased because it was my project. I was originally from local government. I took up the position to lead the project because at the local government level in Wagga Wagga we were feeling frustrations. We needed to have bigger action on salinity. So it was a wonderful opportunity to start the project and to get together all the information scattered around lots of different little projects all around Australia, not just in New South Wales. That information has been gathered together in the booklets so that at least there are some colour glossies to start people thinking about it. The Local Government and Shires Association sent them out to all councils in New South Wales with a letter of support; they have been very helpful. Then the councils approached us about coming to talk to them in more detail about the information in these booklets, because they are just summaries.

A lot of them have been involved in training; 25 per cent of councils in New South Wales have sent staff to training. That might be one staff member from a small council but some of the Western Sydney ones have sent about 40 staff members. We have done training sessions at their request, tailored to what they wanted for different types of staff. These range from half-day sessions up to a project we are doing in the Murrumbidgee at the moment which has four-day sessions. So all staff within councils—not just the engineers but the builders, the planners and the people from parks and gardens—are working together to build up a knowledge of what the impacts and processes are within their town and to come up with a list of things that they can do to implement change that suit that level of risk and their resources. It has been very successful.

Another of the outcomes of the project was to work with the Western Sydney Regional Organisation of Councils, who will speak to you later, to run an urban salinity workshop in February. One hundred and fifty people from all around Australia came to that. They talked about how we are going with urban salinity, what the latest information is and how we can work with councils. It was aimed not just at councils but also at people who work with councils—from the developer side and also the state government agencies. They asked for another one dedicated to local government risk responsibility and liability. We held that last month and 60 people attended. They were mostly from New South Wales but some were from Victoria and Tasmania. So local government, although they are very limited in resources and what they are able to do, are coming a long way and they have really embraced this project and done a lot of work.

There is a lot of variability between councils as to what they can do and their knowledge base and so forth. So it has not been a case of saying, ‘You need a dedicated urban salinity officer,’ but rather, ‘How can all of your staff make a slight change to the way they make decisions or do their day-to-day work that will impact positively on salinity management and salinity impacts in your town?’

Senator WORTLEY—Is that also in regional areas?

Ms McGhie—Yes, this is a statewide program.

Senator WORTLEY—I notice that a lot of them tend to centre around townships. Do the council staff have a working relationship with the land-holders?

Ms McGhie—Not all councils do, no. Councils are still responsible for those rural areas but they tend to be more involved with the urban dwellers. Some of the councils and the CMAs are seeing salinity as a way to get into that natural resource and get those people involved in the issues outside their towns as well. But some of the councils also work very well with the farmers. It depends on the nature of the relationship, on the resources and on the local people and networks.

Senator SIEWERT—I would like to follow up on that and I have some other questions as well. Do the towns do an assessment of what is causing their salinity? For example, in WA there are some towns where the salinity is caused by the town itself. In others, of course, it is a catchment issue. Do the towns do an assessment of what is causing the salinity problem by working with the catchment in which they are situated?

Ms McGhie—Some towns do. I am aware of the Western Australian Rural Towns Project and Mark Pridham and so forth. We do not go to the extent of doing that within a town and doing a cost-benefit analysis. A lot of our towns are a lot larger. Most of the ones in the Rural Towns Project have about 2,000 to 10,000 people, whereas Wagga has about 55,000 people. So it is a much larger mass to map and collect information on. A lot of the councils are not at the level of investigating the causes and so forth because there has traditionally not been as much research and investment in urban salinity.

Senator SIEWERT—So how do they know they are doing something that is going to be effective, if they do not know what is causing the problem? For example, in Merredin in WA we thought it was a catchment problem but it turns out that it is a lot of in-town stuff. So they have had to change the way they are dealing with it. Unless you are doing the broader research and investigation, how do you know that the town is not wasting its time?

Ms McGhie—We are trying to do it as an integrated system and not just concentrate on water, vegetation or building codes, but to have all of the departments of council working with the community to apply best management practices in all of those areas. When the research catches up then we will be able to say, 'We will concentrate on this particular aspect of the overall plan.' But in the interim, because urban salinity is so complex, it is hard to say it is definitely stormwater or sewage leakages or whatever.

Senator SIEWERT—It is more about getting them thinking about natural resource management?

Ms McGhie—Yes, and integrated water cycle management.

Senator SIEWERT—That was just a follow-up. I want to ask about natural resource management generally and about some of the reforms that you have made and referred to. How do you make decisions about how you allocate money in the full context of natural resource management in New South Wales?

Mr Fishburn—In allocating money towards the reforms, as I said in our opening statement, with the \$436 million over the four-year period the CMAs will be taking on the reforms that relate to native vegetation in a big way, from the point of view of property vegetation plans for potential clearing applications but primarily for incentives on the ground to ensure that native

vegetation is protected and well managed. Our water reforms are another thing altogether. They are now primarily funded directly through state budgets and allocated on a priority basis.

Senator SIEWERT—What I was trying to get to is how you make the decisions—the decision-making process you use to decide what the highest priority is and how you allocate that money. Do you have a process that you go through to work out where the best bang for your buck is in salinity and natural resource management?

Mr Fishburn—If I can speak generally about natural resource management for a moment, one of the methods used is looking at where some of the hazards might line up in terms of overlay. If you get a number of hits in a particular area, that will determine what sort of money you would spend in that area in terms of a priority arrangement. Generally speaking, with our water reforms, it has been more of a push from a policy point of view and implementation on the ground with our Water Management Act. That has been across the state. With salinity it is a little different in terms of targeted dollars. I might defer to the experts in terms of where we spend our salinity dollars, and where we have spent them over the years.

Dr Herron—My experience has been that the CMAs are under fairly firm directives in terms of the property vegetation planning process, but at this stage the incentives process is still a little bit ad hoc and CMAs are developing their own interim approaches for prioritising funding to on-ground works. There are a range of approaches available, including mapping information, which is available across the state. It may be of variable quality depending on where you are in the state, but there is salinity hazard mapping that has been done by our department. There are also a range of models that we have been introducing to the different CMAs to assist them in their planning decisions. I have been involved with some of those models. They are designed to assess the impacts of proposed changes coming from the land-holders, whether it be clearing or a change in management practice, and the impacts might be on salinity, biodiversity, carbon sequestration or some other environmental impact. They use those figures as a prioritisation tool or mechanism for ranking proposals and allocating funding on that basis. The CMAs are doing that a bit differently at this time.

Mr Fishburn—I suggest also that the investment strategies in themselves are a prioritisation of on-ground works across the state. That goes through quite a rigorous process in terms of advice from major agencies as well as going through a joint steering committee of the Australian government and the state government.

Ms McGhie—To give an example of that, in the Murrumbidgee we are working with four towns at the moment on an urban salinity project which is based on subcatchments within the Murrumbidgee that are exporting the most salt to the river, so that is a measured outcome. We have been to the towns and we have been talking about what types of things they can do. For example, one of the things you could do to protect your house would be to vibrate and cure your cement better. That helps with salinity but it also helps with having strong foundations that withstand movement of the soil, termite attack and so forth. So there are all those multiple benefits from that quite simple action which is a requirement of the building code anyway. It is more a matter of educating the builder about the importance of what they are doing. It is about the flow-on effect of those decisions. Some of it is really based on science; some of it is based more on multiple outcomes.

Senator ADAMS—Thanks very much for your submission. As I said, I am from rural Western Australia. The area I come from, the Great Southern, is certainly affected by salinity. My question is probably a little bit more practical. With the area affected that you are speaking about—since I have not seen a big map—are you using aerial mapping equipment as well to find out just what you have: exactly where your salt is, how deep it is and whether you have dykes?

Ms McGhie—If you are talking about urban salinity, a lot of the aerial work is not good for urban salinity, because you are looking at vegetation changes and so forth. In terms of salt store and soils, you can tell that Western Sydney, for example, has a lot of salt in the soil profile, so any leakage of water in an urban system will mobilise that salt.

Mr Fishburn—In terms of the mapping arrangements, I am aware of a number of programs that have been done. We are also involved now in a \$7 million project with BRS, in terms of its airborne remote sensing of salinity. I am not an expert in the area. I do believe though that, with anything that is remotely sensed, ground truthing is extremely important to get down to the tin tacks. My background is in flood plain management, and that approach augurs well there as well. You cannot just take remotely sensed photographs and then expect to draw all the conclusions from that. A lot of work has been done on the ground with EM surveys, which I think are probably a little bit more reliable at this point in time. But that is the extent of my knowledge of those airborne mapping arrangements.

We have done a lot of work in regard to sorts of hazard mapping, which we did in Wagga. You have to be extremely careful when you start to produce those sorts of maps, particularly about the economics of towns and also liability. We found that also with our flood-mapping program, which we brought to a halt after a number of years for the same reasons. So we do it little bit more surreptitiously, if you like, but also transparently with the community, to bring them along with the awareness side of it, rather than just dropping the maps on the table.

Senator ADAMS—For any properties that have to be changed around or anything like that—or with anything coming into the town that is a problem, that is owned by someone, where you want to rearrange things so that you can get organised a bit better—is there any avenue through your department or through the state that provides compensation to people with problems? I am just thinking about a river coming into a town in WA, which has caused all sorts of problems, and they had to actually reroute it. It was quite tricky. So I am really interested in the compensation issue, because, once we get out into other communities with the upper catchment people, I am not prepared to go along with something that is affecting the lower catchments. Some of your towns must be affected in that way, because your rivers do not just start outside the town; there is a big issue further back to cause some of the problems you are getting.

Ms McGhie—I am not aware of any cases where people have requested compensation within a town, as such. We have always worked cooperatively with the local government and the landholders to come up with a solution that is cost-effective for them but is part of the community action too. We have talked about building codes and whether to apply them differentially. Then it becomes, ‘Okay, you’ve caused the problem but your house isn’t costing as much, so maybe it needs to be even,’ and social and compensation problems like that. But we really have not got down to specific cases as yet.

Mr Fishburn—Sian might add a bit more value to this than I can but in my time in Wagga I have seen a number of solutions put in place to mitigate some of the impacts that were occurring in the low-lying areas of Wagga. One of those strategies was to drill a number of bores and physically lower the water table in that area. In my view, that has been a real solution for that low-lying area, although the impact of that rising water table has been the disintegration of mortar and brickwork in residential houses. I am not aware of any compensation that has been provided for the actual repair in those particular areas. We have concentrated on, as Sian has said, the actual solution and working with local government and the community to solve the problem.

Senator ADAMS—With respect to your Landcare officers and people involved, is the shire council funding these positions as well as the other funding that comes?

Ms McGhie—It really depends on each council, the resources and the relationship they had. Prior to taking up this position I was a natural resource officer with the council, which was totally funded by the council.

Senator ADAMS—If the councils do not fund those positions, how do you get on?

Ms McGhie—Some of it is through NHT funding, some is through community groups and some is through our department and so forth. It is a mixed bag, depending on the community and their needs and the relationships that have been established.

Senator ADAMS—If there is no funding available, what happens?

Ms McGhie—If there is outside funding—

Senator ADAMS—If there is none.

Ms McGhie—If there is no funding at all, it is a case of each person doing their job slightly differently to come up with the same outcomes. If I train an engineer, a building inspector and a planner in the background of salinity, they are still doing their job of expertise but the decisions they make on a day-to-day basis have a huge impact on the salinity cost to their community and the impact on the processes within that town.

Senator ADAMS—I am trying to think of the problem that is outside your town that is causing problems for your town. That is the reason I am asking these questions.

Mr Fishburn—With regard to the establishment of catchment management authorities just from our organisation alone, we automatically shifted across 93 natural resource officers in terms of their NHT funded positions. I guess we could call them Landcare based in certain areas. It is probably best to call them natural resource officers. I just want to differentiate between those particular staff that we moved across and the 262 staff that we moved across from the recurrently funded section of the organisation. With regard to those 93, with the \$436 million allocation over four years, my view is that, across the state in the 13 CMAs, that number will grow rather than reduce in terms of the on-ground projects the CMAs will effect across all the natural resource areas in that four-year period. So I am not expecting that we will see a

diminution in expertise or numbers on the ground; I think we will see a rise in numbers on the ground.

Senator ADAMS—I hope so. So long as they are achieving something, that is important. Thanks very much.

Senator WEBBER—I wanted to return to your remarks where I think you estimated that the cost of damage to roads and highways et cetera was about \$9 million per annum. Can you give us some examples of some of that damage? Following on from that, the committee received evidence in a previous hearing from people who said they did not think that sufficient attention was paid to the issue of salinity and the potential causes of salinity when we are looking at the development of civic infrastructure like roads, rail, foundations, sewage treatment and what have you. Do you agree with that? Does this government have anything in place to ensure that that does happen?

Mr Fishburn—Going back to the first part of your question, I have seen the impacts of salinity on the Sturt Highway between Wagga and Narrandera. There are a number of areas on that road that have been repaired repeatedly because of the impact of the rising water tables. I used to travel the catchment quite a bit. I would see the local council grading the table drains, and I would see the seepage come up straight through the grade each time. The roads were very severely impacted in a number of areas and repaired repeatedly.

Ms McGhie—Those figures that Mr Fishburn quoted were from Wilson's work in 2001, and that makes up a lot of the costs booklet. Page 5 shows some of the types of road damage, and that is in the indicator and the roads booklet as well. I have seen figures done since then in Victoria and South Australia which show that that was what we knew then, but as we know more about it and experts in roads or economics become more aware of salinity and what might happen, their estimation of the costs keeps going up. Initially a lot of it was done by surveys, asking local government, 'Have you got impacts locally?' They would say no because they did not know what salinity was, let alone being able to figure out, 'I've repaired this road 10 times because water keeps seeping out.' A lot of the issue is about awareness.

To go back to something we were talking about before, in Western Australia, I believe a lot of the town issues occur because there are more intermediate and regional ground water flow systems. In our New South Wales towns we have more local and intermediate systems operating, so a lot of the work we do in the towns impacts on the salinity expression within the towns as well. There is still more to do in rural residential zones particularly and in some rural zones impacting on our towns, but it is much more confined to the area of most of our towns. I thought I would clear that up. What was the economics question? I cannot remember.

Senator WEBBER—It was about whether you feel that enough consideration is given to (a) existing salinity and (b) the development of new civic infrastructure in terms of the fact that they can cause an increased salinity problem.

Ms McGhie—I think it is improving, but there is still potential to go a lot further, simply because there has not been historical awareness and there has not been investigation and so forth put into urban salinity, and there is a whole different set of people. We have natural resource managers, but we have to talk to engineers, builders and planners, who do not traditionally talk

to each other. For example, when a ground water person talks about a well-sorted aggregate, they mean it is all one size, whereas to an engineer that is poorly sorted—well sorted means they have a lot of each of the different sizes, because that is how they compact their roads. They have not naturally spoken to each other in the past and they do not always speak the same language. That lack of information flow makes it hard to assess the impacts. We are getting there.

Senator SIEWERT—Do the infrastructure agencies participate in the planning and give money to salinity mitigation? A big issue in WA is that we have been trying for years to get them to cough up dough in recognising that their infrastructure is severely impacted.

Ms McGhie—I work with some of your infrastructure people from WA Main Roads and Queensland main roads, and we have had some input from the local roads people in New South Wales. It comes back to those relationships, awareness and knowledge, when they have so many other priorities and things happening, and them saying, ‘Yes, this is a priority for me.’ If I tell a road engineer they have a salinity hazard and they do not know the cost impact that that could have on a road, they will say, ‘No, I’m an engineer; I’ll just put some cement here.’ It is really about getting that knowledge and experience integrated through all of those different technical fields so that they work together.

It is slowly getting there. The Austroads publications had a booklet on waterlogging in WA—I could give you a copy—that was a baseline five years ago. But recently there have been three or four publications by Austroads about how salinity impacts on roads. So it is getting there and they are thinking about it; it is just a slow process. Urban salinity is five or 10 years behind dryland salinity—as dryland was five or 10 years behind irrigation salinity.

Senator ADAMS—Picking up on what you said about no-one being able to really talk to one another, we go back to the basic education at university. I have got a background in health and I can assure you that now with our multidisciplinary team—with the GPs having one course, the nurses having another, and the physios having another—there is quite a move to try to do their first year together and try to get a team, because they are all having to learn the same things.

Ms McGhie—The New South Wales Department of Primary Industries is working hard on that project. That was one of their actions through the New South Wales Salinity Strategy. In the last year there have been national competencies set for salinity, and people are getting part of that in the training. In the next three years we are working to urban salinity competencies as well. If we can get that at the national level, it gives people another incentive to come along. We can do the same with builders. They now have to have continuing professional development points. Even after they have done their training, you can have another go at them each year.

Mr Fishburn—Senator Adams, could I add to what we were talking about before with regard to the Landcare people or the natural resource officers. You mentioned that that is all very well but it has got to actually happen on the ground. I might add that the Natural Resources Commission in New South Wales will be responsible for auditing the performance of catchment management authorities against their catchment action plans and their investment strategies.

CHAIR—In winding up, could I ask if you have any comments on the approach at the federal level—whether it is assisting or getting in the way or whether there are extra initiatives that you think would assist in what you are doing?

Mr Fishburn—We recently met with a number of consultants who are looking at a number of points in the bilateral agreement. We gave a little bit of advice with regard to the way we saw the bilateral agreement, I guess from a ground base point of view. We saw some sticking points in the bilateral agreement with regard to minor variations that you would make as you move down the track and those minor variations having to be signed off by four ministers. We have given some advice in that regard to ask, ‘Is there any way we can become a little less bureaucratic in that regard and move those things through a little bit more cleanly—in other words, streamline them?’ That was probably one of our major points of concern in trying to streamline some of the arrangements so that things could happen more quickly on the ground.

CHAIR—Could you give us an example if it is appropriate?

Mr Fishburn—I cannot actually give you a clear example of a variation that has occurred. But quite a number of them have occurred, and we have found we have had to go back to the sign-off by the four ministers—which, as you can well imagine, takes a serious amount of time.

CHAIR—So overall it is more a matter of finetuning?

Mr Fishburn—I think so, yes.

CHAIR—Are there any other questions or comments?

Senator WEBBER—Is it possible to provide us with examples of some of those variations that have taken place and that you have had to have signed off?

Mr Fishburn—Sure. That would be no problem. We will give you a written response on that.

Ms McGhie—Could I add a few comments?

CHAIR—Sure.

Ms McGhie—The CSIRO has some funding to do urban salinity research, but for a lot of their work we need to commission it to get it happening. That can be an issue for us when it is a benefit for all of Australia.

CHAIR—So you have to pay for it?

Ms McGhie—Yes.

Senator SIEWERT—So you have to match their funding? Did you say they have got some funding to do research on urban salinity?

Ms McGhie—They have done some research, and then we have totally funded other projects. We are just about to start another one with them. There are a lot of committees associated with Australian standards and some of the work impacts on salinity and salinity processes. The Australian Building Codes Board voted in late 2001 to investigate the efficacy of the building code in relation to salinity. The discussion paper only came out late last year. I think they need some assistance; they are finding it difficult—their staff keeps changing, and getting the experts

in there that know building as well as salinity has been an issue. There has been talk for years about having a national road research project to figure out the specifications of how to build a salinity-proof road for different conditions; that has been tied down to funding and where that is going to come from. We have also got to make sure that salinity is mentioned in the National Water Initiative, particularly in relation to urban areas in terms of water-sensitive urban design and effluent reuse. We have to look at the whole water cycle. These are my personal views.

CHAIR—Could you enlighten me on the Australian Building Codes Board: is that industry based or government based?

Ms McGhie—I am not exactly sure. The building code in each state is picked up by state legislation, but there must have been some agreement at one time to standardise it across all states, because it is frowned upon to have variations. On the subject of state variations, at the moment there is a South Australian one for salinity and recently we adopted one in New South Wales, simply because this other process was taking so long.

CHAIR—What is the group that is working on the roads?

Ms McGhie—Austroads is a consortium of all the different road agencies, both state departments and service providers.

CHAIR—Are there any final things you want to say, that you will kick yourself for not saying as soon as you walk out the door? There are not? Then I thank you very much for your time.

[10.28 am]

CAMPBELL, Councillor George, Spokesperson on Natural Environment and Resources, Western Sydney Regional Organisation of Councils Ltd

FINGLAND, Mrs Sharon Ruth, Assistant Director, Western Sydney Regional Organisation of Councils Ltd

CHAIR—I now welcome witnesses representing the Western Sydney Regional Organisation of Councils, otherwise known as WSROC. Thank you for giving us your time today. It is appreciated. I remind you that the evidence given to the committee is protected by parliamentary privilege. That also means that the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. I also remind you that, should you for some reason at any stage want to give your evidence or part of your evidence—any specific answers—in private, you should ask to do so and we will consider your request. I now invite you to make an opening statement and then we will proceed to questions.

Councillor Campbell—First of all I must admit to being on a bit of a steep learning curve on this issue. I will give a brief introduction to it and then hand over to my colleague. WSROC first got involved in this issue of salinity in 1999 and since then has made a number of submissions to both state and federal authorities on it. WSROC has been very heavily involved in training member councillors in the issue, providing information and so on. Our main concern I guess is that, when we think of salinity, we often think of salinity in the countryside and how it affects farming and so on. We are very concerned that it is a major problem in the Western Sydney area—or a potential problem. We want to ensure that urban salinity is taken very seriously. We think it is a national problem and there is scope for the federal government to be involved and to support the work of local councils and that all levels of government—state, federal and local—need to work on this.

In Western Sydney the state government has announced, you would be aware, plans to develop population centres in the north-west and the south-west. We are concerned about the pressures that that would put on the natural environment, particularly in relation to salinity. Also, with the increasing population of Sydney projected, in the older areas, increased population will also apply these pressures. So we are very concerned that these factors be taken into account. We feel that salinity is one of the factors which ought to be considered when looking at urban planning and population increase.

Mrs Fingland—I would also like to say that, as a fairly recent member of WSROC, I am not actually a technical expert in any shape or form in terms of salinity. We did have an environmental planning officer in charge of this issue but unfortunately he resigned a few weeks ago. Therefore in any evidence that I am giving I would like to make it clear that I can report on WSROC's activities, but I will by no means be an expert on this subject. We have put together a submission which we would like to give you; I have 10 copies of it. I have highlighted WSROC's involvement in the past and the presentations it has given to various committees on the issues. I will then talk about some more recent action since we last reported on it and try to

highlight some issues that the councils in Western Sydney have highlighted to us in terms of where they think more research is needed in the future.

We have an extensive research background and have been advocating for the residents of Western Sydney for over 30 years. In recent years we have managed a range of externally funded projects in areas such as salinity and stormwater management and our organisation continually presents regional concerns to both state and federal governments, including both environment and education issues.

Our region is very diverse. It is a mixture of both natural and built environment, with the major part of it comprising parks, reserves and agricultural areas. For those of you senators who are from interstate, our region stretches from the Blue Mountains and Hawkesbury in the north and covers 11 local government areas and the older areas such as Liverpool, Fairfield, Auburn, Bankstown and Holroyd. So we have a large cross-section of Western Sydney and a population of 1½ million people.

Our region is divided into three major water catchments—the Hawkesbury-Nepean River, Georges River and Sydney Harbour/Parramatta River. These waterways are coming under increasing pressure from the urban development associated with population growth. The region's biodiversity is also threatened from fragmentation and habitat degradation.

The impact of salinity on urban development in Western Sydney was first detailed in 1997 by the Department of Land and Water Conservation. A report we commissioned in 2000, *Western Sydney regional state of the environment report 2000*, also highlighted potential salinity in the South Creek catchment, stressing it would have to be addressed through land management activities on a regional basis. In December 2002 a draft salinity hazard map for Western Sydney was produced, and that has been reviewed and extended in more detail since that time. It did depict a localised salinity hazard for all the areas of Western Sydney with a Wianamatta shales geology—and that is a large part of our region—and identified areas of more extensive salinity hazard where water naturally accumulates, such as in the riparian corridors.

In 1999, in association with DLWC, we hosted a Western Sydney Salinity Working Party, which brought together the Hawkesbury-Nepean Catchment Management Trust and the Upper Parramatta Catchment Trust, together with WSROC, plus three other councils in Western Sydney, the Housing Industry Association, the Department of Urban Affairs and Planning, the LGSA and the Office of Western Sydney. Since March 2000 this group was involved in the Western Sydney Salinity Management Project, which was founded by the Natural Heritage Trust. The activities the trust has funded in Western Sydney have included the employment of a salinity project officer who was based at WSROC, preparation and publication of a Western Sydney Salinity Code of Practice, delivery of salinity training to councils in Western Sydney in conjunction with DIPNR and preparation of salinity resource material, including display posters, pamphlets, a good housekeeping guide, a resource pack and all of those materials. I have a copy of them, if you would like to have a look at them.

The role of the working party was to increase awareness of the salinity problems and explore the management options available to councils, particularly when dealing with new development. The working party, in partnership with the DLWC, was successful in obtaining grant funding from the Natural Heritage Trust, and the salinity officer who was subsequently employed with

that money developed the code of practice for the building industry for development in Western Sydney. The code provided guidelines for councils' development decisions and planning, outline, assessment, management and building techniques to address and mitigate salinity, distribution of information on salinity problems and the provision of solutions to local government, the industry and the wider community.

In March 2001 we made a submission to the New South Wales Legislative Assembly Select Committee on Salinity. We highlighted a number of issues, particularly the recognition that salinity was a major environmental issue affecting a large area of Western Sydney, and noting that the causes of salinity in the region differed from basic dry land and urban salinity models and required greater understanding. A whole lot of issues were identified in that submission, including issues of liability, process and information dissemination, a lack of guidance to councils on how to alert residents to the problem and potential damage, a lack of information mapped at an appropriate scale, a lack of council resources to deal with the growing community concerns as residents became aware of the impacts of salinity, the need for clear and consistent council action based on guidelines covering things like planning instruments, the need to build methods into the Building Code of Australia to talk about salinity issues, the need for greater federal government leadership to coordinate actions across all levels of government and the need for stronger state government commitment to addressing salinity concerns, particularly for large scale urban releases in Western Sydney. We called for further research, particularly mapping at an appropriate scale, and talked about the ramification of actions that had been taken, such as the effect on land value, anger in the community at the lack of detailed information and the further deterioration in surface water quality as subdivision proceeds and inappropriate water management techniques are used in new developments.

Particularly in Western Sydney, the issues that were identified were a lack of acknowledgment at the federal level of urban salinity issues for the region—we were not getting any financial support—a lack of public awareness on the impact on residents and urban infrastructure and a lack of financial support to repair damage to economically disadvantaged areas. As a result we got the natural heritage funding, which certainly has assisted. We are very grateful for that.

A salinity training program was developed by the WSROC project officer in DLWC and offered to councils free of charge. The training was undertaken by 280 people from within our councils in the region. Most councils were covered. We covered a good cross-section of staff from different disciplines. We thought that was really important. For those people who could not attend the initial training, a second summary version of the training was also given to the councils. That training included an overview of the issues associated with salinity and planning, salinity assessments, salinity management, issues associated with master planning of areas and then looked at councils' individual practices.

The Western Sydney Salinity Project concluded in February 2003 and the code of practice was endorsed by the WSROC board, also in February that year. A salinity resources kit in electronic form was launched in Penrith in 2003, by the minister, for the Department of Land and Water Conservation. As a result of this work, a number of Western Sydney councils now require investigative works to be carried out prior to development, particularly on larger sites. WSROC also argued the case for the development of a regional database to give a better understanding of the scale of the problem in the region.

In October 2003, our senior project officer (environment) at that time made a submission to the House of Representatives Standing Committee on Science and Innovation. You would probably be aware of the submission. It was made on the nation's salinity problem. The issues that were covered included salinity research into management options to address the need for: timely translation of research into information tools, applications and systems for effective land management; appropriate and consistent measures of salinity; and a regional approach to the problem. That is why we developed the Western Sydney salinity code. It also argued for the continuation of the salinity working party to link state government technical and research programs, industry peak bodies and local government.

In the submission we stressed the fact that science is problem orientated, yet government is service orientated—and there was a bit of an issue there. We argued that urban salinity needed to be considered within the broader context of integrated water management—in other words, how salinity affects stormwater management, water sensitive urban design and community behavioural norms. We stressed the impacts on agricultural lands at the periurban fringe, lands which provided a significant amount of fresh food to the Sydney market. We also noted how salinity affects land use and planning in urban areas and how land use planning affects salinity processes in turn—that is a cyclical argument. We said it was certainly an ongoing process that required active ongoing research and management. We believed that static or narrowly focused approaches would be ineffective.

We argued that salinity is an issue of prime national importance for Australia. It is particularly an issue for urban areas of Western Sydney, which has significant implications for asset management, risk liability and costs to our community. The effects of urban sprawl on urban salinity included, we noted, the potential and actual degradation of natural and built assets and the cost, risk and liability implications for councils and private landowners; the contribution to urban salinity of current planning regimes, stormwater management, householder behaviour and some water sensitive urban design practices; the cost of salinity affected assets to private individuals in a region that contains large clusters of economically disadvantaged communities; and the need for national coordination of salinity management efforts including the housing and development industry, especially in relation to the BCA.

The salinity working party has continued to have a role as a regional forum for the discussion of the issues. The group supported the Hawkesbury-Nepean Catchment Management Authority's endeavour to establish the Hawkesbury-Nepean catchment as a national action plan region. But this issue has not been resolved and WSROC continues to urge that it should be reconsidered as an acknowledgment that urban salinity is an urgent issue. We also identified gaps, including those in training and awareness and in salinity management. Therefore we got a second round of funding under the natural heritage program to address that gap. Then the salinity code was revised in 2004.

Last year WSROC, as an organisation, developed its four-year strategic plan, which has, as one of its major strategic goals:

Improved quality of the natural environment (air, water; biodiversity, land and waste management) across Western Sydney through the development of local and regional environmental initiatives.

As a short-term action, we proposed to continue to facilitate the salinity working party, and we coordinated the urban salinity conference that you heard about earlier. We are providing ongoing support to salinity management initiatives and research in Western Sydney, collecting data and providing information for the salinity web site. We have also sought to establish partnerships with the CMAs and have developed a WSROC environmental resources pack, combining a series of resources developed through WSROC assisted projects, including the salinity resource pack, for distribution to our councils and to be provided on an enhanced WSROC environmental web page which we are currently building.

CHAIR—Can I interrupt you there briefly, Mrs Fingland. Can I ask, just to ensure we have enough time for people to ask you some questions, if there are any senators who want to jump in now with questions on the initial part of your statement. Others could finish perusing the rest of your submission whilst those initial questions are asked. Is that okay with you?

Mrs Fingland—Yes.

Senator ADAMS—I am really very impressed with the fact that everyone is talking to one another—that is just so important—especially having that number of councils within the organisation. I am just reading in your submission about the distressed South Creek catchment that has already got poor water quality. Can you tell me in practical terms what is actually being done to try to relieve the problem.

Mrs Fingland—A number of years ago some research that was done on South Creek catchment actually identified a lot of air and water quality issues. At that time the state government stopped further development in the South Creek area, as a result of those issues. But since that time there has been at the state government level more pressure for growth of Western Sydney. In fact the state government has recently released plans for growth centres in that area. WSROC is particularly concerned about that issue because of the previous environmental issues for that area. The major growth centre that they are proposing in the Bringelly area in the south-west of Sydney will impact on the other part of the South Creek catchment. We think that may well have downstream impacts on the ground water and on salinity in areas that are already suffering salinity. So we wanted to draw that to the committee's attention.

Senator ADAMS—So what are they actually doing at the moment? They have recognised the problem.

Mrs Fingland—They are planning for a major new growth area there. Unfortunately, the information that has been released from the state government on the growth centre has not covered anything that deals with this particular issue, so we are not aware of what has been done in that area.

Senator ADAMS—Even in planning their parks, their streets and whatever else, surely they are taking this into account. What are they doing to try to prevent any problems? Are people going to be encouraged to have lawns and gardens? What are they going to do? You have already got a huge problem. There has surely got to be something being done now.

Mrs Fingland—I agree with you entirely, which is why we made a submission on the growth centres highlighting these issues and asking what work had been done to actually model the

impact of the urbanisation of that catchment on the ground water. But we have not had a response to that as yet.

Senator SIEWERT—Can I ask about CMAs. You touched on them very briefly. How many CMAs cover your area and how do you work with them?

Mrs Fingland—We have the Hawkesbury-Nepean CMA of the Hawkesbury River system. We have the upper Parramatta catchment area, which is now part of the Sydney CMA. We have just recently approached the Hawkesbury-Nepean CMA. We are in the process of approaching the Sydney CMA. With the Hawkesbury-Nepean we are developing a memorandum of agreement to work together on these issues of regional importance. We will be working with both CMAs in relation to that. But it is early days as yet.

Senator SIEWERT—The funding that you are getting is NHT2 money, not national action salinity plan money.

Mrs Fingland—That is right. We have had the NHT funding, and we have had a third level of funding from that now to establish some of the things that I have been talking about that we have done.

Senator SIEWERT—It is not salinity money per se; it is just general natural heritage money.

Mrs Fingland—Yes.

Senator WORTLEY—We have had a submission from the New South Wales Department of Natural Resources. I think you were in here at that time.

Mrs Fingland—Yes.

Senator WORTLEY—They were talking about the information booklets that they put out and the research that is being done in addressing issues of urban salinity. Do you have much to do with them?

Mrs Fingland—Yes. A lot of the work that was done—and in fact the booklets that you have been provided with—was done jointly with WSROC. Our salinity project officer, who was housed in WSROC for two or three years, actually worked with them closely. More recently, our environmental officer worked very closely with them. So WSROC has been the sort of conduit to reach out to the councils in our region, because it is very difficult with the great number of councils that there are. So we act as a sort of interface between the state agencies and the councils to bring them together on these issues of regional importance.

Senator WORTLEY—You said a bit further on in your submission:

At the federal level there has been only little direct engagement with urban regions. Federal regional policy is focussed almost entirely on rural areas, yet the great majority of Australians live in cities.

That was not the impression I got from the submission of the last organisation that addressed us. What do you think needs to be done? Is there enough coordination between the various organisations or do you think that is one of the major areas that needs to be addressed?

Mrs Fingland—We have had a number of delegations to Canberra to talk to the federal government. Each time we have tried to highlight the fact that one in 11 of the Australian population live in our region and yet, when regional issues are considered, it appears that urban regions do not get the same level of attention that rural regions get for some of the issues. Issues such as salinity and urban salinity, for our region, are something that have to be thought of at a regional and national level. Often, some of the federal government decisions that are made about aspects they are involved in have quite unintended consequences that are suffered at a regional level.

For example, decisions that are made about immigration at the federal government level can have quite significant impacts at a local council level, particularly in some of the poorer areas of Western Sydney that are major recipients of a lot of immigrants. Sometimes some of the decisions that are made at that level actually have consequences at the lower level, which we would argue are not always taken into account. That is why an issue like salinity, which is of such national importance, really needs all levels of government—firstly, to be aware that it is such a major issue and then to deal with it together. It is not something that just local government or just state government could deal with. We have tried to get the message across a number of times.

Senator WEBBER—I want to go back to the issue of Natural Heritage Trust funding. Is that ongoing funding? Do you still have the salinity project officer?

Mrs Fingland—No, we do not.

Senator WEBBER—So it was just a pilot. It was not ongoing; you have to reapply every time you come up with a new idea.

Mrs Fingland—Exactly.

Senator WEBBER—That is a pity, really. I quite like the idea of the salinity project officer. Can you tell me how much money you have received out of the Natural Heritage Trust? I am happy for you to take that on notice.

Mrs Fingland—I will take that on notice. I certainly have the information but it is not with me.

Senator WEBBER—You were saying that you have applied for some new money from the Natural Heritage Trust.

Mrs Fingland—We received a third level of funding and we are two-thirds of the way through that—

Senator WEBBER—What was that for?

Mrs Fingland—That was to develop the urban salinity conference. I think most of the money went on development, the information packs and the background information that went out with that.

Senator WEBBER—So it was for the conference, basically.

Mrs Fingland—Yes.

Senator WEBBER—Following on from what Senator Adams was saying about the development in your area, do the local councils that are part of your group, in their planning processes, take the impact of salinity into account when they give planning approvals for the development of new civic infrastructure and what have you? I do not know about New South Wales but, certainly, in Western Australia it would be a local government responsibility to give planning approvals.

Mrs Fingland—That is right, they do. As a result of this training that has been going on, they are certainly requiring more and more studies to be done, particularly for larger scale developments. But there is a certain reluctance on a site by site basis. There is a bit of an impediment there. For larger scale developments they certainly can require work to be done.

Senator WEBBER—But, in terms of your own council's process for a new development within their area, they would take that into account for the development of all new infrastructure.

Mrs Fingland—Yes. As a result of the training program, more and more information is required all the time, as you can imagine, as more people become aware of the issue.

Senator ADAMS—Are you keeping your federal members—it is quite a large area—up to speed with what is going on with this?

Mrs Fingland—Not having been directly involved in this, I am not quite sure how much detail is involved. We certainly send them all the minutes of our meetings and that sort of thing. I do not know whether anybody from their office attended the workshops because I was not directly involved in those.

CHAIR—You might need a charmed offensive, perhaps—now that Mark Latham has gone.

Senator ADAMS—Getting back to the state of the South Creek and the focus of treating salinity on a regional or rural basis rather than on the urban side of things, where is its catchment? Where does this creek start getting really salty? Is it fresh upstream? What area is causing the problem? You will probably find that somewhere up the top it is not a salty creek but as it comes down it becomes salty.

Mrs Fingland—The salinity hazard mapping that was released showed the whole of the river system being affected. It also highlighted greater concentration in riparian areas. The mapping that was produced at that time was not of sufficient detail to be able to specifically pinpoint an individual property or anything like that. That was an issue that was raised in previous submissions—that there needed to be more detail. Western Sydney is expected to accommodate a large amount of the new growth proposed as a result of the metropolitan strategy. There are

going to be two new growth centres: one in the Bringelly area in the south-west and another in the Marsden Park area in the north-west. They are all affected by that river system. The north-west area may have some downstream impacts as a result of what happens upstream in the Bringelly area. All that area has been identified as having salinity risk problems.

Senator ADAMS—It is just going to get worse, by the sound of it.

Mrs Fingland—That is right.

Senator WORTLEY—With the grants you have received it appears you have done considerable educating of the community and the councils. A lot of resources have gone into that. As we all know, when you have information you have to put it into practice. Has the money been available? Has any of that been put to use applying the practical plans that need to be put in place to address the issues of salinity in that area?

Mrs Fingland—Most of the funds that WSROC has been working on with the state government departments have been allocated towards education and training. But some of that education and training has been highlighting issues about best practice in building techniques and things like that. From that point of view it has been used in that way.

Senator WORTLEY—Is it your view that there needs to be more money put in to be able to address those issues?

Mrs Fingland—I believe so, yes.

Senator SIEWERT—Which program in NHT do you access for funding?

Mrs Fingland—I have only heard it referred to as the Natural Heritage Trust funding, which was in three stages. I do not have any more detail than that.

Senator SIEWERT—It would be useful if you could provide some information because of the way the NHT is structured. I am interested in finding out how local government and regional local governments can access NHT and whether it is a problem that the bulk of the funding is provided through regional bodies. Given that you have a number of regional bodies in your area I am interested to see how you did it and whether other regional local government associations are having trouble accessing money when they have a number of CMAs in their area.

Mrs Fingland—I will take that on notice and get back to you.

Senator SIEWERT—Thank you.

CHAIR—I have the impression that you are still in the very early stages of trying to address this issue, given that it is such an intensively urbanised area where there is continual development and infrastructure pressures. Is that a fair assessment?

Mrs Fingland—Yes, I think that is a fair assessment.

CHAIR—Do you feel you have got the base information in terms of the geological stuff to at least have a starting point, or are you still fishing around in the dark in that respect?

Mrs Fingland—I think it is very early days in terms of the information that is required. For instance, we talked about South Creek. I am not sure whether they have actually done extensive ground water modelling in terms of what the impact of that urbanised area is going to be. As I said, it may have been done, but it has not been made publicly available.

CHAIR—There are certainly issues with funding and assistance. It seems to me that we may have got to the awareness stage but there is still a shortfall, even in expertise, looking at some of the things from the conference—and that is not just expertise at your level but amongst some of the different associations. We heard from the last witness that they are still figuring out how to build the right sorts of roads and so on.

Mrs Fingland—Exactly. If I could comment in relation to local councils' expertise, having worked in local government. One of the issues for local councils is that there is an increasing awareness, first of all, that the communities they represent are becoming aware of the salinity problem, but they are not coming to councils and saying: 'Can you help us? The foundations of our houses are starting to crumble and there are a whole lot of other issues.' That is a problem for local government, because in New South Wales, as you are probably aware, we have rate capping. That is just an additional burden for the councils.

The other issue for councils is the impact of salinity on councils' infrastructure: the pipes in the ground and the roads. In particular in relation to the pipes in the ground, large parts of Western Sydney were developed quite rapidly as major release areas and when the infrastructure in the ground starts to fail, it starts to fail over a large area because it was all built together. I was describing it earlier to somebody. It is a bit like after 15 years of marriage when all your whitegoods fail at the same time; it is the same with the pipes in the ground. Roads can be maintained continually, pipes cannot. So that is going to be a major problem that councils in Western Sydney are starting to become aware of and, as far as I am aware, most councils in Western Sydney have not been putting aside money for the maintenance problem that will occur. Coming back to your point, the awareness is starting to grow, but how to deal with it is still a long way off.

CHAIR—I turn to the issue of more fulsome federal involvement. I am not trying to provoke jurisdictional bunfights or anything, and leaving aside issues of money, do you have any comments about that? Are you broadly satisfied with their approach? Are you trying to get the focus of their salinity activities to acknowledge urban issues as well?

Mrs Fingland—We certainly want them to acknowledge urban as well. We would go further inasmuch that, for about the last 10 to 15 years, we would argue there has been less involvement at the federal government level in terms of a whole host issues to do with urban areas. A lot of projects that were actually initiated under the Building Better Cities program, for example, very helpful to areas like Western Sydney but there has been little engagement in those sorts of issues over the last decade. We would therefore say that salinity is one of those issues where maybe there needed to be more pilot studies. We would actually call for all levels of government to be involved in that process.

CHAIR—Thank you very much for your time.

Proceedings suspended from 11.04 am to 11.16 am

TRUMAN, Mr George Frederick, Catchment Officer, Projects (Salinity), Namoi Catchment Management Authority

CHAIR—Welcome. Your title sounds promising. Thanks for giving us your time today. It is much appreciated. Looking at the map, it looks as if you have travelled a bit of a distance to get here, so that is particularly appreciated as well. We have received your submission, which has been labelled No. 25. Firstly, are there any amendments or alterations you want to make to it?

Mr Truman—No, that is fine, thank you.

CHAIR—I am required to remind you that evidence given to the committee is protected by parliamentary privilege and that the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. Also, if for some reason you do wish to give your evidence, part of it or any answers in private, you can ask to do so and we will consider your request. I would like you to make an opening statement and leave some time for questions.

Mr Truman—If you have a look at the little orange brochure that the first group gave you, you will notice that the Namoi is located in the north-west part of New South Wales. It is about 500 kilometres north-west from here. My role is as the Catchment Officer, Projects (Salinity). For eight years prior to that, I was the technical officer doing salinity research and salinity technical advice with the Department of Natural Resources, the organisation that you heard from first today. For the last year, I have been with the Namoi CMA, predominantly with operations, providing incentives, giving advice and getting on-ground works happening in the areas of salinity. This is predominantly my role. The Namoi catchment covers 40,000 square kilometres of New South Wales, and it is probably the most productive area of land we have in New South Wales and in Australia.

Thank you, on behalf of Namoi CMA, for the opportunity to respond to the submission. I would just like to highlight a number of issues that we mentioned in our submission. As the CMAs are in their early days, with limited resources, it is essential that the CMAs access and work with the available resources as efficiently and as effectively as possible. There have been a number of national programs that have developed good resources and developed good networks that have filtered down and are helping to address on-ground actions.

However, there are a number of issues that could impact on the success of federal programs in getting investment in landscape change happening on the ground. These are, firstly, the failure of continuity of some programs. I will just mention the salinity teams, on which there has been a state government whole-of-government approach, predominantly made up of DNR and DPI. With reference to the Namoi catchment, we previously had six people as part of the salt team. These people were really important in getting salinity investigations, looking at research, taking on board the monitoring and getting those findings into something that we could then deliver to those on the ground who are helping to work with local government and land-holders in making the change. This team has since been abolished, even with the introduction of the CMAs. There is one person remaining of those six, and this leaves a big gap in being able to do salinity investigation, get the information from research and deliver it on the ground.

Secondly, in terms of research and development, there needs to be an ongoing focus, particularly in the northern part of the state, because our climate is very different and our activities and on-ground works in managing salinity are quite different from those in southern parts of the states and also in other parts of the country. Therefore, we need to have continuing and ongoing research and dollars to maintain the research and to identify the on-ground works that are going to work, particularly in our Namoi catchment where we have a much greater focus on farming systems in controlling salinity rather than just revegetation using pastures and so forth. There is already quite a bit of research but it is very hard to maintain staff because of the short-term projects. We have a lot of projects that start and then cease and we do not end up with some good outcomes that we can then extend to help with providing on-ground change.

Thirdly, the economic value of production in the Namoi catchment was worth in the vicinity of \$800 million in 1996. This represents a large proportion of the state's on-farm production. We really need to maintain our viable resources and focus investment in this area; otherwise there are going to be huge socioeconomic impacts on Australia in terms of loss of production.

ACTING CHAIR (Senator Adams)—You were probably here before and heard that I am a farmer from Western Australia right in the middle of the salinity area. You were talking about trying to improve the farm management practices. Have you got a combination of drains, trees and vegetation, and less fertiliser?

Mr Truman—We steer away from drains in engineering works, particularly in our northern landscape, because of the climatic conditions in that rainfall never exceeds evaporation for any month of the year. We have the ability to soak up water using our farming systems and our cropping systems. That is why we really emphasise response cropping and opportunity cropping can have huge impacts in terms of salinity management. Trees have a place in the landscape but that could be in particular parts of the landscape where there are contact zones, dikes and things that you talked about earlier. Largely we look at agronomic options and try to steer away from engineering works, particularly in that landscape.

ACTING CHAIR—So it would be mainly no till?

Mr Truman—Yes, no till.

ACTING CHAIR—Getting down to the people on the ground, as far as contracts go for those people who are working for the management authorities, what sorts of contracts do they have in terms of time?

Mr Truman—I am the salinity officer; there is only one of me. I am only funded for two years. I am funded under NHT. This is this issue with continuity and having those people on the ground. Because of that lack of people in the other agencies to provide that technical input and getting the investigations, a lot of my time is spent trying to do the investigations or trying to find out what information is coming out of some of the research, getting it into a form that we can deal with and then extending it. It puts a lot of pressure onto the one person but also, in terms of trying to get the most up to date across such a large catchment, it is very limited in terms of getting a really good, broad on-ground works happening because of the limitations of that.

ACTING CHAIR—Do you have a two-year contract?

Mr Truman—It is three years but—

ACTING CHAIR—But you are two, yes. Would you think that, if we could extend, that would be of help? Coming from WA, this is our biggest problem. You cannot keep the good people. You cannot blame them. They are there, they are working and then someone else says, 'Right, we'll have you privately to do something.' They go off as a consultant instead.

Mr Truman—And that was the ongoing issue with the previous department, DPI, as you heard—the very short-term nature and not having the continuity of staff. Often we do, as you say, lose staff that have built up the rapport. The big thing in getting this landscape changed is being able to get that trust with the land-holders in the community. I am very lucky that I have been in the Namoi for eight years now. If I had just come in and it was my first year I would be a long way back, but I have had that time with the land-holders.

ACTING CHAIR—From our point of view, there is nothing more frustrating than getting someone going on a project, them leaving and then trying to train the next person, who does not understand. So it is a two-way system.

Senator WEBBER—To continue on with the funding issue for a minute, the CMAs get money from the Natural Heritage Trust. Do you get it from the action plan as well?

Mr Truman—Yes. I have a copy of our investment strategy with me, which I could leave with you today.

Senator WEBBER—Is any of that funding ongoing or is it all just for specific pilot projects? You are obviously a three-year proposition—if they are lucky enough to keep you. The problem that Senator Adams has been alluding to is common. Is there no guarantee of continuity of funding?

Mr Truman—From talking to our program manager I think it will be, given the high importance of salinity in our area. I would have to probably confirm that funding side for you. I might do that later, because I am not involved with the—

Senator WEBBER—Feel free to take it on notice.

Mr Truman—Yes. I would have to talk to our strategic manager about some of those things. As I said, I am basically on the ground spending the \$9 million that we have for salinity at the moment. That is predominantly my area. But I think there will be continued funding. Because I have the commitment to stay, I obviously will. But in some positions it has been a problem that people move on before the funding runs out and so we have this problem of continuity.

Senator WEBBER—And then it is hard to get someone else to step into the breach. You have funding from a number of different sources. That must be difficult in itself—finding your way through the maze of who you get money from for a project and which body is meant to fund what—rather than just having an overall strategy with overall funding.

Mr Truman—Sure. By looking at all the numbers in our submission I am sure that it looks like a fairly complex issue.

Senator SIEWERT—Are you a NAP priority region?

Mr Truman—Yes.

Senator SIEWERT—That would mean that the investment plan is tied in with that; so there is an ongoing stream of funding for at least three years. Do you feel that you have all the plant based options that are needed to deal with salinity in your area? You said particularly that in the northern part you do not use drainage. Do you feel that you have all the deep-rooted perennials, for example, that you need? Or do you need more of those options to deal with salinity in your region?

Mr Truman—That is a good point. We certainly need more. As I said, there is quite a bit of research coming out, but it is southern focused and quite often the species that they are recommending will not tolerate the acidic soils—

Senator SIEWERT—By southern focused do you mean not in your region but in southern—

Mr Truman—Southern New South Wales and into Victoria. There is certainly a lot more need for investigation and identification of species. Some of that has been initiated through the Sustainable Grazing on Saline Lands project, which is a national program. However, because of the climatic conditions of the drought, a lot of the projects which were starting to look good got stalled. We were really looking to that program to come up with some new and on-ground solutions and to get the economic side of it going. That is the thing: we cannot be just locking up the land. We need to be looking at sustainability. So we were really looking to some of the outcomes of that program to provide us with some good options that were going to be productive and therefore more likely to be adopted. We are hoping that now, with a better season, the programs can continue. There might be a need to re-fund some of those that we had hoped would have good outcomes but just did not get going.

Senator SIEWERT—In your submission you talk about developing partnerships with the CMA. Who do you have partnerships with now and who do you foresee that you would like to develop them with further?

Mr Truman—I suppose one of our main partners is the Cotton CRC, because the big issue with landscape is not so much the development but the extension of the best management practices. The land and water module which has been developed by the Cotton CRC sets a lot of those guidelines. We have formed a partnership to get the Cotton CRC to implement those BMPs. We are looking at forming partnerships with similar CRCs, especially in trying to pull together best management practices, because that is one of our main catchment targets—getting land use changed through the adoption of BMPs. There are a lot of varying guidelines for different areas—grazing, horticulture and broadacre livestock—but we would be looking to the CRCs to try and pull some of those together into formalised guidelines.

Another area relates to a lot of our major input suppliers—for example, fertiliser companies, chemicals or banking. Obviously, a lot of these people have a vested interest in developing

partnerships because without the ongoing sustainability of the farming systems there is not going to be the demand for their products. We would probably see this taking place through maintaining the sustainability of the farming systems or our agricultural base, and there is also the need to look at environmentally sensitive options and use this as a marketing tool. This may involve looking at people working under different BMPs who are getting some sort of incentive when they sell the products they have grown on a landscape based on BMPs. There is an opportunity for joint funding here between the CMA and agribusiness to try and extend the money that we have for our incentives. Although we have only had a limited budget initially, if we can develop some partnerships there then we may be able to extend our funding and our ability to do our on-ground works longer.

Senator WORTLEY—How does the uncertainty of future funding impact on future plans to address salinity and the impact of salinity in your region?

Mr Truman—It is certainly not hindering our current activities. We will deal with it a little bit down the track. Because we are really just getting going—we have only been up and running for a year—we are trying not to focus on those potential funding limitations but to at least make a change and get things going as well as we can at the moment. Once we have more involvement and more of these partnerships, we might then need to look at that side of things.

Senator WORTLEY—You said there were six people in the team and then you were down to only one.

Mr Truman—Initially, yes. That was the salinity team that was in existence prior to the CMA becoming involved. The issue there is that there is only one member of that team left. Those three or four people were filters of information and were able to provide technical input and support. That leaves fewer people with an understanding of the processes and the investigations of some of the technical outputs that are coming from some of these bigger, broader investments and joint ventures that are taking place and the hazard mapping that you have heard about earlier. Without having those people to find out the best ways of addressing or tackling different parts of the landscape, it makes it hard.

At the grassroots level—where I am providing the on-ground technical input as to what works where—not having that information filtering down makes things difficult. We are trying to work with the best options. We have a lot of tools out there. Without having someone to run them and operate them and draw on them, it limits things. Even though we are trying to achieve the best, with really only one person involved with salinity in the Namoi, it is pretty limited. As Sian and Natasha spoke about in the previous round, there have been a lot of great developments in terms of tools and in terms of those teams that were built up. But without that continuity, we have lost a lot of that.

Senator WORTLEY—Do you think you are moving fast enough to stop the damage that is occurring in that region? What needs to be put in place for that to occur?

Mr Truman—We have a lot of the tools there. There needs to be some more input into staff in the natural resources area to try and keep up with some of the research. Particularly since we are looking for more of a focus on research on the north, we are going to need the people to drive those projects. That is the important thing. We are moving reasonably well given the resources

we have. But it would make things a lot firmer and give things a bit more of a long-term nature if we had more staff to drive those.

Senator WEBBER—It is one hell of a job for one person. It is a bit of territory to cover.

Senator ADAMS—With regard to your catchment management authority, do shires put funding into this as well? Are they putting much into it?

Mr Truman—I am not sure on that one. I would have to check.

Senator ADAMS—As a general observation, are the land-holders that are involved in all of these catchments working cooperatively with you? Do you have anyone saying, ‘It’s not affecting me at the top of the catchment, so therefore I don’t want to know’?

Mr Truman—No. It is working quite well. We have just drafted our catchment action plan, which is our 10-year program for investment and how the Namoi is going to address natural resource management. We are just in the process of running our community consultations. They started on Wednesday. The launch is today. So far, we have had very good attendance at the community consultation meetings. The CAP has been put together with the CMA and stakeholders such as government and land-holders. Because of the economic focus and the huge production areas that the Namoi has, in the areas that are at risk there is certainly awareness and the desire and willingness to work with us. They recognise that salinity can have a huge economic impact in terms of loss of production. Generally, the community is working very well. Previous departments and the DPI have had ongoing involvement with salinity in various ways. They seem to be working quite well. The catchment action plan is the key, because it is the community’s plan. We are going through that phase at the moment.

Senator ADAMS—Is there any evidence of urban salinity in your towns?

Mr Truman—Yes. We have three or four towns affected by urban salinity. Gunnedah, where I live, has quite a major issue. We have an urban salinity working group which is made up of the council and specialists. We are seeking funding for that as we have probably spent about \$200,000 doing a lot of investigations. One of your earlier questions was about doing the work but, likewise, we needed to know what was going on. We have done a lot of EMI surveys, soil testings and whatnot. We are now at the stage of employing someone to develop a community awareness program for us. We will employ someone for a week a month, or something like that, to take those findings, extend them and work out what to do. It is a locally driven system. We were talking about that before. It is about the land-holders and the urban dwellers managing their water in order to manage the salinity. As I said, we have a number of towns affected by urban salinity. Through Sian and the local government series we have run training for all the councils and for builders, health inspectors and environmental people.

Senator ADAMS—That is good.

Senator SIEWERT—Your catchment plan is going out for consultation, but where are you up to in getting to the accreditation process with the Commonwealth for NHT and NAP funding? You mentioned your investment plan.

Mr Truman—That one has been signed off. We have 24 town meetings at the moment, and then I think there is two months of draft exhibition. I think it will all be pulled together in about February.

Senator SIEWERT—Your catchment plan is the same as what we call in WA our natural resource management plans. Is that for the whole of the CMA?

Mr Truman—Yes. That is for the whole of the Namoi CMA. Then we have our investment plan and also an implementation plan which has very specific actions that will address some of those targets.

Senator SIEWERT—So that is currently out and will go through the consultation process you just articulated, be out for consultation for two months and then be submitted?

Mr Truman—It will be submitted to I think the NRC—

Senator SIEWERT—That is right. In New South Wales it has to be ticked off by them and then it goes to the Commonwealth.

Mr Truman—I think that is right.

CHAIR—Can I just ask whether you have any comments about the federal approach and whether there are aspects of that that are helping, or could help further, or are getting in the way?

Mr Truman—I do not have a lot to do with the national level. I reiterate the issues relating to funding. My comments are mainly on the issues I have already addressed and you probably know better than me how you can deal with addressing those at your level.

CHAIR—It is just always useful to know about the local level—

Mr Truman—Yes.

CHAIR—particularly about things that are getting in the way. Everybody wants more money, of course. We will see what we can do about that. I was just after any perspectives you had. One of the earlier questions from Senator Adams was about funding from shires. Can you provide answers on notice about that to the committee secretariat in as much detail as possible.

Mr Truman—Certainly. We have developed one of our management targets in conjunction with the northern region local government association to have planning associated with landscape change. I would imagine that through that target there would be some input from—

Senator ADAMS—Just on that, any recurrent funding from the shires for people on the ground, such as yourself, is really what I am looking at. I am looking at whether they are prepared to put money into positions, which might make them a little more secure than three years.

Senator WEBBER—They are not going to fix it in three years.

CHAIR—Are there any final points you want to leave us with?

Mr Truman—I am not sure if you are interested in such a specific level.

Senator ADAMS—Absolutely.

Mr Truman—The Namoi investment strategy is what you were previously given. That was the information that went to the community about the catchment action plan and that was the insert that went in all our local papers last week. That might give you a little bit of a guide.

CHAIR—I am not 100 per cent sure of the geography, but I think Gunnedah is a fair hike.

Mr Truman—I got up at half past four this morning.

Senator WEBBER—Thank you very much for making the effort to get here then.

CHAIR—We appreciate you making that effort.

Mr Truman—Thank you very much for your time and for listening to our submission.

[11.46 am]

AL BAKRI, Dr Dhia, Senior Lecturer in Environmental Management, University of Sydney

COPELAND, Professor Les, Dean of Faculty, Agriculture, Food and Natural Resources, and Director, Centre for Salinity Assessment and Management, University of Sydney

VERVOORT, Dr Rutger Willem, McCaughey Senior Lecturer, Hydrology and Catchment Management, Faculty of Agriculture, Food and Natural Resources, University of Sydney

CHAIR—Welcome. Thank you for giving us your time today. We have received your submission, which we have numbered 17. Are there any amendments or alterations to your submission?

Prof. Copeland—No.

CHAIR—I remind you that evidence given to the committee is protected by parliamentary privilege and that the giving of false or misleading evidence may constitute a contempt of the Senate. If you wish at some stage to give your evidence or answers to any specific questions in private, you may ask to do so and we will consider your request. I invite you to make any comments about the capacity in which you appear and to make an opening statement.

Prof. Copeland—I will introduce myself and my colleagues. I am here in an overview capacity. My main role is in managing and leading research, particularly in this area. My colleagues Dr Vervoort and Dr Al Bakri are much more technically skilled in aspects of our work than I am, so they will answer specific questions.

I want to point out a few highlights from the submission. We feel that the national action plan has made an excellent start to this major issue. It has certainly been very successful in community engagement, which is very important. But salinity is very much a longer term problem and has taken a long time to develop to where it is at present. The national action plan can only be a start to finding solutions to this problem. The time frame is of the order of 20, 50 or perhaps even 100 years to try and reverse the situation. Our perspective is very much that of a research provider. I heard the comments of the previous speaker and I endorse them all. I have not met him, but I would make those comments myself, from the other side of the fence.

Clearly, there is always a need for more science, but it is not just a matter of doing more science; it is a matter of making sure that the science that we do is of the best quality and recognising and understanding the laws of nature which govern the process of salinity and will lead to its solution. We do not really have a good idea of what a healthy landscape is, how we measure it and how we measure the progress we are making towards getting to that point. This is a question that has been raised in a number of forums that I have been to and there is not a clear picture of what it is that we are trying to achieve. Landscapes change and we cannot say that we want it to be like it was before human settlement or at some other point, because we do not

know. These are really important question: what is the end point? How do we get there? How do we measure that we are actually moving in that direction?

A lot of the science needs to be focused on cause and effect—are we looking at the right problem in the right place? Establishing cause and effect is a very important basic principle of science. You need to look at the feasibility of solutions: are they technically feasible, are they sensible, are they economically feasible, what will be the social outcomes?—and so on. There also needs to be a recognition that solutions have a local aspect—that the cause of salinity and addressing those problems will vary from location to location.

I read a new article in the last few days by Professor David Pannell from the University of Western Australia, who put forward the thesis that we need to be investing more in technology and that our technology base for solving salinity problems is perhaps underdeveloped. I would concur with that view. It is a well-reasoned article. I could provide the reference to the committee, if you wish.

CHAIR—Yes, if you could.

Prof. Copeland—In terms of the science, more work should be done on risk analysis. Are we targeting the areas where most benefit could be gained? This is a fairly new area of science, particularly in natural resource management, and one that I believe should develop. One of the other areas that could be a weakness in a program like the national action plan, which has a strong community involvement, is migrating the latest and best science from one area to another. There are many generic technologies in information management, GIS and other areas. Making sure that local groups have access to that is quite critical, so that they are working in an area and using things that are the best available. In terms of information, a lot more needs to be done on information management systems. It is another new area of science. Inventories on ongoing and completed research and access to those inventories is something that is perhaps underdeveloped.

I fully agree with the comments that the previous speaker made on the skill base. Maintaining the skill base is absolutely critical. His comments were more directed at the project level, and I do not need to repeat any of that. It is also important to maintain the skill base in regional communities. It is not just the people who work on salinity; it is people who fix equipment and people who do other things. That relates to the viability of regional communities, which is a much bigger issue.

Finally, we all have to recognise that there are political sensitivities in this area. Perhaps there is a need for a more consistent approach in regulation, but the resolution of some of the issues is more at the political level than at the scientific and technical level. I am not really an expert in that, so I will leave it at that.

CHAIR—Thank you.

Senator WORTLEY—I have a question on the Centre for Salinity Assessment and Management. How long has that been established and is it ongoing?

Prof. Copeland—It has been established in the university for about five years. Prior to that there was substantial work in this area and this really was to consolidate it under one umbrella. We have had research projects in the area of salinity for a long while.

Senator WORTLEY—Does your faculty have to seek ongoing funding?

Prof. Copeland—It is really a virtual centre—it is just an umbrella. Our main activities are to coordinate. We run an annual symposium and have public fora and that sort of thing. We do not actually do any research through the centre per se; it is done on an individual project basis. The members of the centre would submit research proposals in their area to funding bodies and they would be funded as individuals.

Senator WORTLEY—Does that receive any federal government funding?

Prof. Copeland—Only in the sense of the funding that flows from DEST.

Senator WORTLEY—Thank you.

Senator ADAMS—We have heard evidence that the work undertaken over the past few years using stream sampling and airborne electromagnetics—which I asked about before—shows a more optimistic view of salinity in the east. We have this huge fight, of course, because we maintain in Western Australia that they are only looking at the Murray-Darling Basin. We get sick and tired of hearing about it. But, from your scientific side of things, there have been a number of reports put out saying: ‘Woe is me. Everything’s just disaster over here.’ How do you feel about what your scientific evidence shows? Is it as bad as it is portrayed to be?

Prof. Copeland—Perhaps I will defer to my colleague, Dr Vervoort.

Dr Vervoort—Maybe Dr Al Bakri will want to comment on that too. I think there are two things. One is that there is a difference between looking at a snapshot and trying to understand the time trends. While there is some research which shows that, basically, in terms of time trends, it almost seems as if some salinity is not getting much worse in some areas, there are also other areas where we have not seen any salinity appear yet but there is some evidence that it might appear in the future. So it is difficult to assess at this point how bad, how enormous or how difficult the problem is going to be in the future, or where we actually are in terms of having a clear picture of where all the salinity is occurring. There is definitely still a difficulty in understanding what salinity is really man-made and caused by human activities and what salinity is actually primary salinity which has occurred for a long time. It is also not yet clear how human activities have affected some of the salinity that is occurring. There are still some questions about that. What you are seeing in some of the research reports is just a healthy debate on where we are and where we are going.

In my opinion, there is a salinity problem—let us be clear about that. Human activity affects the outbreak of salinity, and there are salinity occurrences which we can manage. However, there might also be areas—and this is where I think this investigation and some of what George Truman, the previous speaker, was talking about are relevant—where we have to go in and first understand where the actual causes of salinity are. It might be different from the other causes that we looked at. There is no blanket approach. That builds into what you are saying. You can

have some areas where maybe salinity is not such an issue and some areas where salinity is an issue. It depends a bit on the local area, the local geology, the local background, local land use and how it has been affected. Does that answer your question? I hope so.

Senator ADAMS—It sort of does.

Dr Al Bakri—Just like many other natural resource problems, salinity is a very complex problem. I am stating the obvious here, but we have to accept the fact that this is a very complex problem. Once we disturb the natural ecosystem, which requires thousands of years to reach equilibrium—and we have given it a significant shock over the last 200 years or so—the natural ecosystem will require a long time to recover, with support and a sustainable approach to management. As far as management of salinity is concerned, in trying to control or addressing the problems, we probably just started that very late—10 or 15 years ago, when we started paying some attention. I really think that in terms of management, although we have made significant progress in public awareness, community awareness and the awareness of government, politicians and universities—our centre was established four or five years ago because there was a need, of course—in terms of on-ground change or improvement we have only scratched the surface.

That does not mean we are not making progress—we are, but it takes time for things to be realised. For instance, in 1998, an audit report for the Murray-Darling Basin Commission showed that in New South Wales there was about 10 per cent of dryland salinity area or dryland country that was affected by shallow ground water but there was another 20 per cent where ground water was rising. So that means that, with the differences from one catchment to another depending on all the biophysical factors and clearing and so forth, probably for another five or 10 years the problem will become bigger and bigger until it reaches equilibrium. So, while we are progressing in trying to address or remediate or control some of the already obvious areas, the problem has not yet manifested in other areas.

Again, I sympathise with the previous speakers because the problem is so complicated that we really need all the resources we can find—not only from government and the community but research providers and the private sector—to work together and integrate the resources. In this way probably we could make much more difference and, hopefully, advance exponentially our approach to the management of the problem.

Senator ADAMS—So how would you suggest you do that integration?

Dr Al Bakri—I could repeat what the previous speakers have said about the resources but, to be honest, in Australia we do not have all the resources we need to address each problem. This is where I think we could have more integration between research providers and the community—particularly now with the existence of the CMA, which is an excellent vehicle to coordinate all these resources. It would be a very valuable approach, which would integrate and get the benefit and, if you like, the wisdom of all the stakeholders in the country.

Prof. Copeland—I just want to make the general comment that I think there are different ways of measuring salinity and salinity threat. Each has its strengths and limitations, and calibration between the different methods is also not the easiest thing to do, so to base a conclusion on one type of measurement is perhaps a little bit open to question. I think the

temporal aspect is also really critical. Taking a snapshot of a particular time does not really give you much information. You need to measure it over a period to see what the trend is, to establish if it is increasing or decreasing. I think that will tell you what is really happening. But I repeat that each of the techniques that is used to measure has its strengths and weaknesses, and we have got to recognise that.

Senator SIEWERT—I want to follow up on what you were saying about integration. Are you involved with the salinity CRC, or have you had much contact with it?

Prof. Copeland—I have had only indirect contact.

Senator SIEWERT—Have you looked at the programs that they are running? They are trying to do the integration we have been talking about. They have got all the stakeholders involved on board and they are trying to do all the different things that you would need to do in a farming system—to integrate the science with the practicality of it; to do the actual on-ground implementation.

Dr Vervoort—From my understanding, the salinity CRC's main focus has been on plant based solutions to salinity.

Senator SIEWERT—Yes.

Dr Vervoort—Why we are not involved is because a lot of our work seems to be concentrating on not looking at plant based solutions—that is, solutions in terms of plants and what types of plants to use—and a lot of their work also seems to be dealing with how to live with salinity when it is actually there. Our work has mainly been in trying to understand the underlying hydrology and geology and how they interact and how catchments differ and how you might have different solutions in different areas, rather than looking at the actual implementation of the management. I think that might be one of the reasons why we are less involved with that CRC. When that CRC was being set up, the university did not get involved in that area; we did not seem to have the right mix of expertise that would fit with what they were looking for. CRCs are built up between different groups with a common goal, and whether you get involved depends on whether your expertise fits with that type of CRC and with their goals.

Senator SIEWERT—I was very interested in the comments you made—I cannot remember exactly how you said it, but it flicked a switch for me—about how you invest your resources, your decision making, when you were talking about—

Prof. Copeland—Risk analysis.

Senator SIEWERT—Risk analysis and decision making—those sorts of things. In Western Australia we have put a lot of effort into what we call the Salinity Investment Framework. In fact, you may have seen some of the papers that Dave Pannell has written about it. What is your opinion on that sort of model? Is that the sort of thing that you were talking about?

Prof. Copeland—I think you have got to have a basis for making decisions. Clearly the magnitude of the problem is far greater than the available resources that can be brought to bear. I think we have to recognise that we have got to do the best with what we have got. That means

putting into priority where those resources are going to provide the most value, targeting problems that can make a difference, perhaps recognising that there may be areas that are beyond the scope of what can be managed, and we do not really have a good framework to do that.

Senator SIEWERT—I should declare an interest, because I was one of the ones that helped initiate that. I understand where you are coming from. I suppose what I am also getting to is that we started off realising that we had to do that and it became very complex, because it is such a complex area. How you then translate that into the community is something we found really hard.

Prof. Copeland—The benefits are not only in solving the salinity problem per se. There are social and community and political sensitivities that need to be taken into consideration. I do not know what sort of group holds the expertise to do that. Scientists are part of it, but to develop a scientific model is going to be very much a small part of what needs to be done. That is where I made my comment about the political sensitivities of these things, which you are obviously much better at understanding than we are.

Dr Vervoort—I just want to add that there is of course a large amount of work ongoing in New South Wales in terms of hazard mapping. The previous speaker can probably give you much more detail about that hazard mapping, about what actually has been done. I think there was confusion for the public between what is risk and what is hazard. There is a difference between those two things. Up until now, most of the approaches have been based on hazard, on looking at hazard. But the fact that there is a large hazard does not actually mean that there is a risk. So this is where I think our comment in terms of risk analysis means that we need to take those dynamic components with it. Hazard mapping is purely static and it needs to also take into account those dynamic components which deal with land use and different effects on the ground which actually deliver the risk analysis. So that is an important component that has not been developed. As to your comment that this is complex and difficult, that is also where some of these new technologies have to come in. We need to have a better understanding of how we deal with risk and how we develop a risk analysis over landscape. Part of our research is focused on that.

Prof. Copeland—I think it also requires a definition of what it is we are trying to achieve. What does the landscape that we are trying to work towards look like?

Dr Vervoort—To comment on that and your earlier comment also, I think it is very important to know where we are going, particularly given that we are now understanding very much more about the high variability of the climate in Australia, possible climate change and possible directions. Climate has not been taken into account as much in these salinity models and in salinity risk assessment as it should have been. Also, in terms of your question about what is salinity and how bad is it, a lot of that might not be able to be visible in the long term because we have such a variable climate. It might take 50 years for a cycle to figure out what things look like. It is bringing a lot of that into it. That of course demands some level of research; I think the universities and some of the larger research providers are best placed to deliver some of that. Then, of course, as the previous speaker was mentioning, it is very important that that comes down to the on-the-ground management, and that link is still something that I think needs to be developed between the CMAs and the research providers. That is still in the initial stage. I would

think that, in the future, that is probably going to be developed further, but that is definitely a focus point.

Senator SIEWERT—Have you got recommendations for how that could happen?

Prof. Copeland—I think there has to be a promoting of discussion forums, a sharing of access to information systems, a developing of information systems to the point where they are not just accessible to people with a high level of technical knowledge. There are ways of capturing that data that is scientifically and technically adequate, but translating that into a form that can be used by people in the local communities is something that probably needs to be developed. There is probably a need for some capacity building and a need to provide more transfer of how to use that information to the people who are actually the practitioners. It is the technology transfer issue that applies much more widely.

Dr Vervoort—It has to do also with your local skills base.

Prof. Copeland—It goes to inventories of what is actually being done at the research level and what is ongoing and what has been completed. Sometimes we actually cover our tracks again, because we just do not know. Sometimes it is held confidential for various reasons. I think in this sort of area it really should be in the public domain.

Senator WORTLEY—Do you have any suggestions as to how that could be better coordinated? We have a number of national programs, including the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the national Landcare programs. There has been some concern raised, and we have received written submissions from other states as well, with regard to the way they are coordinated and the fact that people may be reinventing the wheel in some of those areas. Do you have any suggestions as to how that could be addressed?

Prof. Copeland—I think it comes down to finding mechanisms for sharing information in the first instance and then having some sort of strategic outlook that goes across the various sector boundaries; that might be community, that might be different types of programs. It is managing this competitive versus collaborative tension. You need to have a bit of both. You need to have some competitive element to make sure the science and the work is strong and robust. On the other hand, you need to make sure that that does not inhibit collaboration. That is a very fine point. Where that balanced point is is very hard to define.

Senator WORTLEY—Do you think with those programs in place as they currently are that there will be long-term success with regard to addressing the issue of salinity, or do you think that there are other things that need to be put in place?

Prof. Copeland—I think the programs that are in place should be seen as priming the longer term process, because it is a problem of such magnitude and such timescale. It is also trying to get people engaged in something that they will have no real ownership of the solutions for and the people who benefit from the solutions will probably be future generations. It is about getting away from: 'It is not really my problem, I am dealing with things that affect me here and now,' which I hear quite often. It is getting over that that is an important barrier. It is recognising that we are putting in place something that is not going to necessarily solve the whole problem, but is

going to get things moving and get other people on board, other resources in. That is where this has a real potential.

Senator WORTLEY—A lot of the information that I have read points to the fact that there is not ongoing monitoring. Whereas it might be a solution for now, it might address the issue of salinity in that particular area for now, it does not mean that it will be the way it needs to be addressed in that area in 10 years time.

Prof. Copeland—I would agree with that. I will give you an analogy that I have come across in my academic work. It has nothing to do with salinity. These massive space projects have a 15- to 20-year time line and they are managed in a really strategic way. People work in those projects, even though they are not going to be part of the project when it has an outcome. They talk about putting another generation of rockets onto the moon by 2015. The physicists who are working on that program now are not going to be part of it when it actually comes to fruition. They have a mechanism for dealing with this. It is building that strategic view. I am not that familiar with their management structures, how they achieve those sorts of things, but maybe that is something that natural resource managers ought to look at as a model for things that have a 20-year horizon.

Dr Al Bakri—Building on this, I think one option that would probably be useful to consider in terms of increasing collaboration is to encourage CMAs in their operations to establish partnerships with universities and research providers active in their catchment. This will be a channel for the university or research institution, for CSIRO and private sector consultants and so forth to work closely with the CMAs. It is most important for the research providers to focus on solving problems rather than doing something theoretical and things like that. This would be according to the need of the catchment to deal with salinity. By the way, many of these natural resource issues are not isolated. Most natural resources are interrelated and you could develop a technique or approach that addressed a number of these problems. That is why we need to talk about integration and holistic approaches. But you need the resources from different—

Prof. Copeland—I think we should also recognise that salinity is really a symptom of a problem rather than a problem in itself. It is a symptom of water and landscape management. I think it has got to be recognised in those terms. Following on from what Dhia said, it is a much bigger problem. Salinity is the thing that we can see.

Senator ADAMS—In your research, have the three of you done much on urban salinity? You have mentioned a lot about regional salinity.

Prof. Copeland—We have done a little bit, but our main work has been in the rural areas.

Dr Vervoort—As the faculty of agriculture we tend to focus on rural areas.

Senator ADAMS—I realise that, but you have got rural areas and you have got towns, as we have, of 1,000 people that have got huge problems. That is what I am looking at, not the big—

Senator SIEWERT—Their problems are related to the catchment.

Senator ADAMS—Absolutely.

Dr Vervoort—Although the previous witness, George Truman, was saying that he was working on an approach where communities were getting involved, I have noticed that, with urban salinity, most people seem to be looking for an engineering approach, which is really not our area. That is, they are saying: ‘It is here. We need to address it here. We need to solve it here—that is, we need to build better buildings or do something to divert water drainage and whatever else.’ The approach we are looking at is: ‘Where does it come from and how do we capture it or make sure it does not come from there? Or how do we build houses at a different spot?’ For someone who has bought a house, that is not an option. That person is looking at how to make sure their house does not collapse.

Senator ADAMS—Or then getting further out with your infrastructure, with roads and rail.

Dr Vervoort—Right. In terms of planning I think we can play a role but, again, because most of the time it is an engineering job we do not get involved in that as much.

Senator ADAMS—Do you talk to the engineers?

Dr Vervoort—The last two times we held symposia there have been quite a number of people there from the Department of Lands in New South Wales and there were people from different local councils, and we had some talks on urban salinity. So we do have some communication channels with them. It is just that in terms of the specific expertise we have a few academics who work in this area, they have a certain expertise and that is what we concentrate on. Urban salinity has not been a real focus area.

Dr Al Bakri—I had some overseas experience with urban salinity and water table rise, which is basically the same in some respects. The principle is the same. Mostly this is dryland salinity. But, of course, in addition to that, there is the watering of gardens and things like that. In this case the engineering solution will be significant. The solution to the problem is to lower the water table. In towns and places like that, unless there is a specific recharge area, a natural source of deeper draining, it would probably be a case of resorting to pumping the water or some surface drainage system to get rid of the water or something like that. The principle is similar to dryland salinity in agriculture.

Senator SIEWERT—The National Dryland Salinity Program used to be the mob that were responsible for maintaining and collating all of the research. That has now died. Did you have involvement with it? Who do you think would be the best body now to perform that function?

Prof. Copeland—I can answer the first part of the question. We did have a full member of staff, who has since moved on to another position, who had a significant involvement with that body. That was one of the contacts we had. We had a number of projects that were managed through that—

Dr Vervoort—I was going to link the question you asked earlier about information management. The key thing to me is that it has to be built on national standards. When we have publicly funded projects, the data monitoring and research—whether it is NHT monitoring or NAP monitoring of waterways or whatever—should be organised and collected using some national standard or protocol. It has to be some national body that develops that. Right now there are state bodies that collect data, and different states use different protocols. There is no real

overlap. There is at least some attempt to do a metadata collection in terms of spatial data. The ASDD is one example of a body that is trying to collect metadata. That still does not give access to the actual data—sometimes it does; sometimes it does not. So there is a question of accessibility and usability. A national program should make sure that there is a standard protocol in the collection of research data.

What happens a lot is that a researcher has a program, collects data and writes a paper and the data sits on a floppy, which disintegrates, or is put in report, or whatever else. It is difficult. I read the other day in a newspaper that people were making attempts to collect data on CDs and things like that, but in 50 years time will everybody still know how a CD works? Will you still have a CD player? We might not. So there is a real issue there. That is why I think there probably should be some attempt at a national level to try to build that together.

There are also some real issues with natural resource data. That is why I think a national body should get involved in dealing with privacy, land valuation and property rights. They all need to be addressed before we can release natural resource data in public format, particularly when it deals with agricultural enterprises.

Prof. Copeland—We have had one of our researchers do very extensive soil mapping activity and produce beautiful maps and everything. That data may be highly valuable in 20 years time, when you want to look at what has changed. But where is that data? At the moment it is on CDs and in the person's computer, but it is in a form that may not be useful in 20 years time. We need to think about that before we undertake this research.

Senator SIEWERT—Who do you think should do that, now that we haven't got NDSP anymore?

Dr Al Bakri—The universities could take a lead in evolving systems and things like that. As I said earlier, the partnership between CMAs and the research providers probably could develop these, and it should be national, of course—on national standards. Then probably a system could be established across Australia and made available on the internet.

Prof. Copeland—I do not think there is an immediate answer to that question. It is quite a complex question, when you think about the curating and ownership of data. It is a bit like a library resource. There needs to be some good discussion. Maybe it is best managed through the federal government. It may be best managed through a body such as a university. For example, the University of Sydney for many years, until the National Library was established, held the official collection of books in Australia. So it may be another body. But I do not know that there is an immediate answer to that question.

Senator WORTLEY—Do you have a view as to how we could get that answer? What needs to take place to get to that point?

Prof. Copeland—Having some sort of forum discussion to which the key stakeholders can contribute and really doing some sort of an analysis on the best way of dealing with this. It is not just where; it is also what form—

Senator WORTLEY—And who pays?

Prof. Copeland—Yes.

Senator SIEWERT—I want to follow up your comment about interaction with CMAs. Do you have a relationship with any CMAs at the moment and, if so, how effective is it?

Dr Al Bakri—I have been working with a central-west CMA—before they were a CMA—for a number of years and I still have contact with them. We usually get funding from them, or through them, and we have students working on a catchment and things like that. We interact in a number of ways, including symposiums, meetings and things like that. Recently, I started to develop a relationship with Hawkesbury CMA.

Dr Vervoort—I am the university liaison officer for the Hawkesbury-Nepean CMA. I have not had much action at this point, because the CMA are still trying to get off the ground. I have had several communications from them. There was no reason for us yet to get involved as a university. We as a faculty are very much involved with some of the northern CMAs: Namoi, Border Rivers-Gwydir. We have some contacts with the Queensland Murray-Darling Basin Commission, which is another NRM organisation. Similarly, within the faculty we have some contacts with the Lachlan CMA as well, so there are several CMAs we work with. The university own a property in the Hawkesbury-Nepean area, near Goulburn, and we also own a property near Quirindi and one near Moree. They also fall under catchment management authorities as well.

Prof. Copeland—We have invited all of the CMAs to our centre's upcoming salinity symposium. We have had quite a good response that they will attend and contribute at some point.

Senator ADAMS—Perhaps from that you might be able to formulate some sort of pilot that can be used by all of them to move forward a bit. Don't reinvent the wheel with them, just get them all active. I think Namoi is certainly a very good example.

Dr Vervoort—I want to point out one more thing. It is my personal view, but other people might agree with it. Several people from the CMAs, from the contacts we have, have pointed out to us that a lot of the funding they are getting is based on on-the-ground works and that it creates very few opportunities to build relationships with research providers because there is no money available for research. They all talk about being creative and doing different things. We will find out how that pans out in the end. For them, it seems to be an issue; I do not know whether it is an issue for us. At the moment we are just trying to find out what really is happening. It is new for us, too—we are trying to develop those relationships. But it is a point which has been made to me by several people in several CMAs, and that is why I am putting it to you. I do not know whether there should be more money for research, but that comment has been made to us as universities.

CHAIR—Do you have any final statements you want to make us aware of while you have the opportunity?

Prof. Copeland—We have covered the ground from my point of view.

CHAIR—We have the Hawkesbury-Nepean CMA appearing before us later on today, so you can do a bit of liaising if you are going to be around then. Thank you for your time and your contribution. It is appreciated and it will be of value.

Proceedings suspended from 12.29 pm to 1.44 pm

DUNN, Mr Barry Wentworth, Director, Water For Australia Pty Ltd

GASKELL, Mr Robin Fairbridge, Support Team Member, Water For Australia Pty Ltd

CHAIR—Welcome. Thanks very much for giving your time today; it is much appreciated. The committee has received your submissions as Nos 23 and 23A. Firstly, do you wish to make any amendments or alterations to those?

Mr Gaskell—I wish to add these pilot project plans.

CHAIR—Thank you. I remind you that the evidence you give to the committee is protected by parliamentary privilege and the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. I also remind you that if, for some reason, at any stage you wish to give any of your evidence or answers to specific questions in private you may ask to do so and the committee will consider that. I invite you to make an opening statement, leaving some time for questions from the committee.

Mr Gaskell—Following this morning's session I would like to make a couple of preparatory comments. The Water for Australia proposal is a solution to salinity. The solution involves a water grid similar to the electricity grid. The Water for Australia group has concentrated on the larger areas of rural salinity and has also developed plans for towns. The establishment of a pilot project to validate the grid and the desalination method would permit research into solar power production and show an increase in productivity as well as a decrease in salinity. I have prepared details.

If there is political will for the survival of Australian agriculture beyond its present problems then I believe we should be actively attempting to reverse them. Salinity is just one problem. I am here at this inquiry because I believe I can make a difference and I believe that there is a solution to salinity. The first word I wish to mention is 'Sahara-isation'. Parallels in exploitation of marginal agricultural land are all too painfully obvious. What happened in North Africa is happening in Australia. Marginal Australian farmland is soon to be added irreparably to the desert, unless modern scientific thinking is applied to the problems to prevent history from repeating itself.

The second word I wish to mention is desalination. It would appear that present methods of farming in Australia tend to cause an accumulation of salty water in the subsoil. Logically, the removal of this salt solution from the ground and the separation of it into its components, of water for irrigation and salt for industry, would turn a negative into a double positive. The solution to salinity is desalination. The same desalination technique applies to the return of salinated areas to production, as well as to the maintenance of sustainable farming.

Run-off rainfall is harvested in grid units of one square kilometre. At the lowest point of each grid unit is placed a cement-lined water flow collector. Low salinity water in the collector is stored until needed for predawn surface irrigation of crops, then it is pumped directly to the fields. A small encased bore is associated with each water flow collector and ground water is pumped up into the collector to maintain a water table at approximately six metres. When the

salt content of the water in the collector exceeds a determined figure—say, 1,000 parts per million—a reverse osmosis cycle begins and the brine from this is pumped to the salt factory associated with the water grid.

At the salt factory, further concentration of the salt occurs and the concentrate enters industrial processes. Water extracted here is also pumped back to the fields for irrigation. No other system of treating salinity does all three things: yields the salt as an industrial resource, recycles the water for irrigation and increases the land's productivity while keeping it in agricultural production. This water grid system comprises half stripped forest and half agricultural field. The crops rotate with the forest over 20 to 25 years and the system is estimated to pay for itself and to come into profit when the first forest plantation is harvested.

Criticism of the Water for Australia plan revolves around cost. While there can be little fault found in its physical economy—sustainable production of timber, mixed farming with irrigation, and elimination of salinity—the establishment of a first desalination grid covering a number of farms depends on the effective creation of credit. If salinity represents an extremely serious national emergency—and I believe it does—then the government would be justified in creating low-cost federal loans to fund the first few desalination grids. This is the same method of funding that was used to build the trans-Australia railway, and for the nation to come out of the First World War debt free.

The other cost consideration—the cost of electric power to drive the desalination process—could become a matter of urgency. Were the federal government to give the highest priority to research into alternative means of power production, such as various means of solar power production and the hot fractured rock method, this would be likely to reduce the running cost of desalination grids to insignificant levels.

A pilot project water grid of 100 square kilometres would cost just under \$500 million to establish. Were a water grid system to be established as a public utility throughout salinity prone areas it would drought proof Australia and ensure that the country remained permanently in credit.

CHAIR—Thank you. Do you have any comments at this stage, Mr Dunn?

Mr Dunn—Not at this stage, no.

Senator WORTLEY—Has the Water for Australia system been presented to other science researchers or government organisations?

Mr Gaskell—Laurie Hogan, who is the principal of the scheme, has been to government inquiries and presented it to engineers and others. A number of other inquiries have had the Water for Australia system presented.

Senator WORTLEY—But has anyone in research—scientists or people in universities—looked at it?

Mr Dunn—The University of Sydney has had a look at it. Most who look at it think that it is a huge project, which means that is going to require a lot of government assistance. That is

generally where it stalls. We admit that it is large but it is going to solve a large problem. And it is going to further enhance the ability of Australia to have produce which will stand us in good stead for virtually hundreds of years into the future. Instead of our agricultural land being depleted through salinity and lack of production it will be maintained as viable.

Senator WORTLEY—Has a technical feasibility study been published?

Mr Gaskell—No.

Mr Dunn—I can certainly assure you that every major government in Australia has copies of at least some of our system.

Senator WORTLEY—Why hasn't it been picked up yet?

Mr Gaskell—Mainly because of the cost.

Mr Dunn—As I said, because it is a very large project governments believe that it is too costly to undertake. I believe that at the moment, when there is a surplus of funds, there could not be a better opportunity to consider this, in conjunction with a lot of the issues that we have heard here today, to be implemented. This is really an investment for the future.

Senator WORTLEY—Could you suggest a specific area that it could be implemented in?

Mr Dunn—Yes, there are several and there has been some mention of them here today—such as Wagga Wagga and up around the Gunnedah area. We would certainly like to get something going in Queensland, where there is a tremendous amount of water available, some of which can be distributed to where it is needed. There are a number of sites that could be most suitable.

Senator ADAMS—I was very interested in the submission. There are lots of very practical ideas in it. I would like to refer you to the national water and environmental plan which you and Mr Hogan did. I come from Western Australia and, as well as being a farmer, I have quite an interest in the resource sector. I noted that you were talking about open-cut mining. Are you aware of the project at the coalmine at Collie and what they have done there?

Mr Dunn—Yes. This is going back some years ago: we did a submission to the state coalmines board, and they looked at it with great interest and implemented—albeit in part—what we were suggesting.

Senator ADAMS—Just for the panel's information: at one of the big coalmines at Collie, the Wesfarmers Premier mine, they have made a huge lake. It is about three kilometres by two kilometres. It is going to be a community lake and there is rehabilitation of native bush right around it. It is absolutely beautiful. With one of the federal water initiatives that Senator Ian Campbell announced not long ago, there will be backfilling into another coalmine to form another lake. It is absolutely incredible.

Another one is the tree plantations that the Water Corporation at Albany have, just opposite the Albany airport. They have done exactly what you have got there, and it is very successful

with their tree plantations. All the ground and stormwater from Albany is being pumped back out there, and they are utilising it in that respect.

Mr Dunn—Yes, there are about 2,000 mines that have been either worked out or are in the process of being mined. We maintain that each of those provides a substantial backup for the water grid to draw off. Up in the Bowen Valley alone, there is one stretch of coalmines there which runs 20 miles long, 10 miles wide and about 90 feet deep. That could hold several times the size of Sydney Harbour and provide ongoing water for goodness knows how long. In addition to that, up in the Gulf Country, where you have tremendous differences in the amount of water that falls on the country, and most of it runs off into the gulf, we should be starting to even out the amount of water that is distributed right through the country—rather than having it just falling in one particular area and running off back into the sea again.

CHAIR—You mentioned that costs are the thing where it keeps falling over. What is the cost?

Mr Dunn—We did do a costing, and we had all the figures. Roughly \$1.5 million per square kilometre is the base cost.

CHAIR—And you were suggesting that once it was established it would be viable for—

Mr Dunn—Forever. The good thing about it is that the salt that comes out—any salt that we collect—becomes a resource for further development. Fifty-seven per cent of PVC is salt based. One of the products manufactured from salt becomes one of the ingredients in PVC.

CHAIR—We had evidence from the department in a previous hearing where we heard that causes of salinity and things which are done to address it are quite different in different parts of even eastern Australia, and I think we have been told that Western Australia is different again—

Mr Dunn—We do not exclude them.

CHAIR—Would this be suitable for everywhere?

Mr Dunn—Yes. We are actually talking to them in Western Australia. We have had numerous discussions with the Premier's key man over in Western Australia. A lot of the salt issues that go across Australia come across from the west initially, in terms of salt water being uplifted and blown inland. So we are quite interested in the sorts of initiatives being taken over there and having the ability to implement them as well.

Mr Gaskell—I would like to add something on the funding story. It would be something which would start small and grow little by little as piping was laid and as new salt factories were established. The first one would be the hard one, because money would be going into it. Eventually, after the first forest was cut, it would be fully into profit. Subsequent grids added to it could be funded from the salt profit and from the tree profit.

Mr Dunn—All up this could be about a 100-year program to do the area we are anticipating from the gulf down to Victoria—so an area some 300 kilometres wide—as concerns water across the board. This would become not only the food basket of Australia but probably a very large exporter as well.

CHAIR—We have received several submissions from landowners in South Australia through this inquiry which have been critical of the use of deep drains to draw saline water away from an area. Do you have any comment on those concerns?

Mr Dunn—It has been suggested that it should be piped back to the ocean. We see that as totally unnecessary, because what we are looking at is using the salt that is collected to manufacture other products. Therefore, yes, where there is heavy salinity, we say that there is no problem with channels, for want of a better word, being constructed over the area we are working on and with the water in those channels being fed into the water flow collector. That water would then go through the treatment process before being sent back out onto the land. Nothing is wasted. It is all used to further develop the overall product.

CHAIR—Have you put in applications to the NHT, or any of those programs, for a pilot project?

Mr Dunn—As I said, we have certainly brought it up in both federal and state arenas. Again, it is a question of cost. I think there is now a groundswell of interest in the effects of salinity and the need for water. The drought that we have had over the last few years has brought the issue home that we need to have a reasonable reservoir of water available to allow farming to continue uninterrupted.

CHAIR—On that wider issue of water availability and drought and as regards your earlier comments about the Sahara and production on marginal land, do you see as part of both addressing the problem and preventing future issues that there are areas that we should not be farming, because they are too marginal?

Mr Dunn—There are areas where the soil structure is not in the best interests of general farming. One area in particular that comes to mind is down near Canberra, which was very poor basalt country and there was very extreme erosion. Of course, virtually nothing grew there—there is only stunted tree growth and not much else. I would say that that would most probably be suited to reforestation on a long-term basis rather than a short-term basis—say, 25 years. So this would be looking at putting in a timber industry that is going to last probably 50 or 100 years. What we are looking at is drawing up the minerals from the deep and, through the leaves, depositing that on top of the soil so it enriches the soil.

CHAIR—Are there any other things you want to make us aware of while you have the chance?

Mr Gaskell—Yes. Saltgrow has done research with halophytic hybrid gum trees. They would be ideal sorts of trees for strip cropping in salted areas. It would seem that a water grid system would probably work best as a publicly provided utility and set up by government regulation rather than leaving a farmer here and a farmer there to have a go. Two major grid areas have been put forward by Water for Australia: one in Queensland, New South Wales and Victoria and the other in Western Australia. We think that the eastern one would be the best to start with. We have already mentioned that water from the north would add something like two inches per annum over the grid area if much of it were added to the grid and brought south.

Senator ADAMS—I would like to go back to the chair's question. Have you applied for funding from the federal government?

Mr Dunn—Yes. Going back some time, we made an application to AusAID but it did not quite eventuate. Again, they felt that it was too large to be undertaken in one project. That is virtually the stumbling block: people keep saying that it is too large to undertake in one fell swoop. This is why we eventually came up with the idea of setting up a pilot project in which all of these methods we are currently promoting can be put into effect, plus any new ones—certainly working with universities and other technical people, as well as people in the field. So you would get a cross-fertilisation in terms of how the system works and the problems that are likely to be faced, and your field people would bring in new data about the problems they are facing. So it would become a working model.

Senator ADAMS—Taking that a little further, at the present time this is something the government is looking at, and 'partnerships' is the key word.

Mr Dunn—Yes.

Senator ADAMS—When did you as an organisation last approach the government?

Mr Dunn—It would have been about 12 months ago. We put it through Danna Vale, who is the local member in Sydney; she promoted it. As I said, at this point in time, it all revolves around funding.

Senator ADAMS—That is interesting. So you have not approached the current minister?

Mr Dunn—Not in the last 12 months.

Senator ADAMS—You have mentioned universities and people on the ground. As a suggestion, if there is any way that you can get those people together and put forward a submission, that would be something. You are not going to be able to do it by yourselves. You need everyone else to be able to do it.

Mr Dunn—Yes.

Senator ADAMS—I suggest that you look very strongly at that and submit it.

Mr Dunn—We are happy to do that.

Senator ADAMS—I would also suggest that you give a presentation to any members of parliament that you have in your area and get them to support you. That is a way to really move forward.

Mr Dunn—Thank you very much. We are happy to do that.

CHAIR—Thank you for your time. We appreciate your contribution.

Mr Dunn—It was our pleasure.

[2.08 pm]

VERNON, Ms Sharon Lynette, Program Manager, Hunter, Hunter-Central Rivers Catchment Management Authority

CHAIR—Welcome. Thank you for giving us your time today; it is much appreciated. We have your submission, which is submission No. 2. Are there any amendments you wish to make to it?

Ms Vernon—No, thank you. It can stand.

CHAIR—You probably heard me talk about parliamentary privilege earlier and the giving of false or misleading evidence. If you wish to give evidence in private, let us know and we will consider that. I invite you to make an opening statement, after which we will ask you some questions.

Ms Vernon—Thank you for inviting me to come along today. I want to put things in perspective. The Hunter-Central Rivers Catchment Management Authority covers the area from Gosford to Taree along the coast and from Newcastle out to Merriwa in the west. It is an area of 37,000 square kilometres. The salinity issues are mainly in the Hunter catchment, although there are a small number of salinity problems in the Manning subcatchment, the Avon. The two main issues of salinity in our area are river salinity and dry land salinity. At this stage, irrigation salinity is not an issue for the Hunter area.

The river salinity issue is very much related to the geology of the Hunter Valley. It is an area of marine sediments associated with the coal that is in the valley. Those sediment soils have high salts in them, so any water flowing over the surface of the soil, or the ground water flowing through the soil, dissolves the salts and takes them through into the river system. There is dry land salinity resulting from land use changes. The Hunter Valley has been settled for a very long time and the changes from deep-rooted vegetation have allowed water tables to rise. That combination of the geology and the land use changes has resulted in significant salinity issues for the Hunter.

I refer you to the hand-out. There is a graph which shows the levels of salinity in the Hunter. The interesting thing is that the levels of salinity in the Hunter River at present are higher than the predicted salinity levels for a number of Murray-Darling Basin catchments into the future. As you can see from the graph, even the mean salinity levels are above those for the Macquarie and most of the other streams. So we already have very high salinity in the Hunter related to the geology and the land use changes. It is estimated that something like 50,000 hectares of the Hunter Valley are affected by salinity. That is about 2.3 per cent of the catchment.

Despite many submissions and representations going back over a number of years, the Hunter has been excluded from NAP funding. As with all the coast, we have not received any of the national action plan funding. We have small amounts of funding under the Natural Heritage Trust, a little bit from the National Landcare Program and a little more state salt action money. It has really only allowed us to do small-scale subcatchment studies and works. We have not really

been able to get a full understanding of the underlying sources of salinity and the transportation systems. They are the real gaps that we have at the moment.

As you would be well aware, the Hunter has a very large mining industry, which is of high economic value to Australia. Salinity has an impact on that. In the power generation industry, for instance, Macquarie Generation contributes about 40 per cent of New South Wales power to the grid. A 10 micro siemens per cubic centimetre increase in Hunter River salinity adds about one-quarter of a million dollars a year to their annual water management program—and 10 micro siemens is not very much. The region also has grapes for the wine industry and many other crops, very well established horse studs and other things which rely on irrigation. They have a maximum tolerance for salt of somewhere in the 1,500 micro siemens area. It is predicted that, without any remedial works—and what we are doing at the moment is really scratching the surface, so to speak—and if we do not do some more work in that area, places like the Goulburn River in the western part of the Hunter catchment will reach 1,500 micro siemens for quite a bit of the time.

Industry in the valley has made quite a contribution towards addressing salinity problems. Under the Hunter River Salinity Trading Scheme, which I think is unique in Australia, the catchment management authority runs an operation subcommittee which is set up under the New South Wales Protection of the Environment Operations Act. Under that scheme the salt level of the river is monitored by the Department of Natural Resources and on high flows mining and power generation industries are allowed to discharge their saline water into the river and they pay. They have credits to be able to do that. The operation of that scheme costs something like \$0.5 million a year, which the industry is paying for. They can buy and use those credits. They have recently had the first auction. It was over \$500 for one credit unit. I am not sure what the credit unit is, but it is a significant cost to them to run that scheme. They are doing their bit to try to reduce their impact on salinity levels in the river.

The CMA would certainly like to do more. We have identified that we need that more broad-scale investigation. A lot of the funding that is coming through now—the NHT money—is used very much for on-ground works. We have not got the baseline information to know where to best target a lot of those works. We feel as though we are in many ways flying blind. We tend to be concentrating on areas where there are already obvious signs of salinity, where you can do something. We are doing small-scale subcatchment studies and remedial works. We do not feel that we are really tackling the bigger issue and getting a full understanding of the real, deep-seated source of the problems. We are expecting some state salt action funding to be available soon to work on a combined program with the Hawkesbury-Nepean Catchment Management Authority looking at ground water flows.

We will also be doing another broader subcatchment study picking up urban salinity as another major issue and one that we really have not put much time or effort into at this stage because we do not have the resources. There are certainly issues we would like to address. We have not been able to fund them, because of the funding restrictions. We would certainly be keen to be included in the priority catchments so that we can really tackle the salinity that is already having an economic impact in the Hunter.

Senator ADAMS—Thank you; that was a very interesting submission. I really believe that for your catchment you need to be working together. We have heard evidence from others. Have you been here all day?

Ms Vernon—No.

Senator ADAMS—We have heard evidence from the university about communications between the different organisations involved with the salinity problem and about funding. In your catchments and local government area it seems that not everybody is going along the same way as far as the authority goes. There might be a little bit of a power struggle there as to who should be doing what. I really do think for us to go forward now we need to form partnerships. How are you working? Are you taking note of other catchments? How is the whole jigsaw fitting together in the problem you are trying to address?

Ms Vernon—One of the things is that many people do not realise they have salinity. Because we do not have broad-scale investigation, mapping and identification we do not know exactly where the salinity sources are either. For instance, the project we are hoping to get going with the SAP money is looking at the Black Creek catchment, which is in the Cessnock area. There are lots of vineyards and some mines there—it is a high-growth urban area. We certainly have the intention to work with Cessnock City Council on that. They are very much aware that salinity is becoming an issue there.

For instance, Black Creek is a discharge area for effluent from the treatment plant. There has been a lot of contention over the years because the EPA wanted Hunter Water to stop putting effluent into that stream. The irrigators said, ‘No, if you do that there will be virtually no flow and what will be there will be so saline that we won’t be able to use it.’ So there is a bit of a stand-off there. But certainly in this project we are looking at getting the council involved, working with the vigneron and getting the mines in that area involved—making it a partnership. The CMA was previously the Hunter Catchment Management Trust in the Hunter. So we have been around for over 50 years and we have had a long history of working in partnerships, and that is certainly the way that we intend to go forward.

Senator ADAMS—You said you are not really sure about what you are dealing with. I think it is important to know the underlying cause before money is poured into projects. Our academic people are desperately trying to drill down to the community and share their knowledge of what is going on. I have seen this happen where I come from in Western Australia, and it is a nightmare. You have catchments going off here, there and everywhere, with an awful lot of money being wasted and nothing really being achieved. I know it takes time, but it is so frustrating. I cannot say it enough—and I seem to be repeating myself today—that you have people with the evidence and other people with the practice. We have had a very good demonstration from George Truman on what they are doing in their area. The money will be there, and it is just a matter of you all getting together and really knowing where you are going, what you are going to do and how you are going to achieve it. I am not trying to be rude; I am just worried about—

Ms Vernon—I assure you that we have projects sitting and waiting, and we do not have the money to do them. The small amounts of money we have got through the Natural Heritage Trust are for on-ground works. We have not had the money to do the investigations. Our staff, the

Department of Natural Resources staff and the Department of Primary Industries staff are all in agreement about what we need to do. As I said, we have been doing it on a small scale where we know there is a saline issue, but at the larger subcatchment level and getting up to the broader areas we do not know what we should be targeting. We have not had the money to target it anyway. It is a difficult situation, where we have not had that money to do the basic on-ground survey to find out where we need to be going.

Senator ADAMS—You need to get everyone together. I know what communities are like, but to get further ahead you really need a collective—you need partnerships. You have already said that you are not really sure what might be happening a bit further on. That might be affecting you and something else might be affecting the next community or the next area, so I really would like to see—

Ms Vernon—We are ready to go as soon as we have something to go out and do it with.

Senator ADAMS—I think you need a leader to pull it all together.

Senator WORTLEY—One of the questions I had written down was: what, in your view, needs to be put in place to get the baseline information? I think you have just answered that.

Ms Vernon—As I said, we have identified the ground water flow system to understand what the ground water is doing, and we need to do that broader transportation study so that we know where our recharge areas are. Certainly, you can identify discharge areas more readily, because once they are a problem you can see that the vegetation changes, with salinity salt scalds and the like. But we need to gain an understanding of the broader geological water flows to really get a handle on where the best place is for us to be targeting the funding that we do have to do the remedial work.

Senator WORTLEY—You did say earlier that you had received small grants from the Natural Heritage Trust and the National Landcare Program. That money was put into research—

Ms Vernon—No. Essentially that funding is all for on-ground activities. The current round of Natural Heritage Trust investment strategies are virtually all for on-ground activities.

Senator WORTLEY—So what research was done prior to that?

Ms Vernon—As part of doing those small on-ground activities, you do small EM surveys and the like to understand just that small subcatchment that you are working on. But we have not been able to go ahead to get that broader subregional type of understanding.

Senator WORTLEY—As part of those programs is there future money that you will be accessing?

Ms Vernon—We hope that the Natural Heritage Trust funding will continue. We certainly have funding in the three-year investment strategy, which has another year and a half or so to go. That is essentially for on-ground work, so it will be operating on that smaller scale.

Senator WORTLEY—The terms of reference of this inquiry are to assess the long-term success of the federal government's programs. How would you view that from the point of view of the Hunter Valley?

Ms Vernon—The NHT has provided us with some funding to do some works. Over a number of years we have been critical of not being included in the NAP funding. That is where the majority of the funding for salinity projects has been directed. We have been critical and we cannot walk away from that. It is certainly still the case that we believe that we have a valid case for saying that the Hunter has a significant salinity issue that should be addressed, just as some of the western New South Wales catchments have been. It should have been included.

Senator WORTLEY—What is your understanding of how the regions were selected to be part of the program?

Ms Vernon—That is a very good question. I do not know. I have heard rumours, but I do not think I will go into them. It did not seem to matter what case we put forward; there was no change, no inclusion of any of the coastal catchments.

Senator WORTLEY—So you do not have any reason why the Hunter region was not included as part of the program?

Ms Vernon—No, I do not.

Senator SIEWERT—Has there been an assessment of the salinity in your region compared to other regions? Did the Commonwealth sit down and do that?

Ms Vernon—Not that I am aware of. There are salinity reports on a state basis that put it into some perspective. They certainly support the belief that the Hunter already has high levels of river salinity in particular and growing dryland salinity and urban salinity.

Senator SIEWERT—I want to pursue the funding angle. My understanding is that, under NHT2, for regions to gain access to NHT funding they have to do a regional strategy and get that accredited. Has your region done that and is it accredited? I keep referring to regions because in WA we call them regions not CMAs.

Ms Vernon—Yes. Before the CMAs were established, which was at the beginning of last year, all catchment boards and catchment management trusts prepared catchment blueprints. They set out the projects and the targets that we had to meet. That was the basis of the current three-year investment strategy, which has been approved and funded by the Commonwealth and the state. In our area we had three former boards that all prepared blueprints. The next phase which catchment authorities are required to do is to prepare a catchment action plan, which for us brings together those three documents. We are reviewing them, filling in gaps and refining them. But it will be the same type of thing. It will have management targets and catchment targets.

Senator SIEWERT—I am thinking ahead about whether there is ever going to be NHT3 and the continuation of NAP. Do you think you would be in a position to say, 'Here's all our planning. Here's our investment strategy. To achieve these targets we need to be able to fund

this, this and this and we need to deal with salinity.’ Do you think your CMA will be in a position to hit the ground running because you have done as much planning as you can?

Ms Vernon—Yes, definitely. Certainly the catchment action plan will have targets for salinity. It will be one of our areas of concern. We have some shelf projects that we could pick up tomorrow and start implementing if we had the funds to do that. So, yes, we are certainly ready to go.

Senator SIEWERT—I will follow up on a point that Judith was making. It is a point I have heard before, and it was brought out here this morning—that is, the ability for researchers and scientists to engage with regional groups. In my experience in Western Australia, in being involved in regional groups and on the other side in trying to get information across to them, it is hard to find how to engage with regional groups when you are so busy planning and getting their investment strategy done. With all the planning they have had to be kept running all the time, and it has been hard for people to get the information to regional groups for them to be able to use it. Has that been your experience? What suggestions would you make so that that collaboration can happen more smoothly?

Ms Vernon—I will give you an example of where we are doing that at the moment. It is the state salinity action program funding. We are working very closely with the Department of Natural Resources, and they are providing the technical expertise to the CMA. We have engaged the Australian National University, and they are carrying out a ground water interaction study for us at the moment. That is a three-year study. That is one of the things we need to do to be able to understand what is happening. They are looking at three of our priority catchments to get a better understanding. That is a pretty good partnership—the CMA working with the department and getting the university involved as well. It is the sort of thing we have done fairly frequently, and there is plenty of scope for continuing that type of research.

Senator SIEWERT—Did the CMA initiate that?

Ms Vernon—It was back in the Hunter Trust days. It came through. It was a partnership. We always worked very closely with the department then, and we continue to. We were working with them and identifying the salinity areas we really wanted to target.

Senator ADAMS—On the land disturbance industries—you were talking about the discharge from one of the factories—can you give us a bit more on the industries in the Hunter that are probably causing problems?

Ms Vernon—Open-cut coalmining is a significant area of land disturbance. There are large areas in the middle part of the Hunter with highly saline marine sediments where we have a large area of disturbance of the surface. One of the areas of concern for the CMA, and the reason we have the Hunter River Salinity Trading Scheme, is that those mines are making water. Ground water is flowing into the mines and it has to be disposed of. We are now finding cases of mining being done under rivers, and diversion of rivers is not uncommon. What we are concerned about is that we are fracturing the rocks. We are changing the aquifers, interrupting the ground water flows, and, the more we do that, the more we fracture the rock, which exposes more highly saline rocks for the water to flow over, which produces even more salinity. So we have a potential time bomb, I suppose, in that we have a lot of open cuts which, at some stage, people

will walk away from; they will be finished. For the long term, and at the moment, we have a salinity trading scheme whereby the mines store their water on-site and they are allowed to discharge it in a very controlled way—and only on a high flow. When they have finished mining and the voids are full of water, nobody will be there to discharge on a high flow, so there may be seepage through into the river as a constant flow of salt.

I suppose there is some concern that we are seeing the legacy of some old mines around, say, the Cessnock area where we have acid mine drainage. These are mines where the water is getting in and because there is high sulfur coal there we are getting acid mine flow coming from there. We are very conscious that we do not fully understand the ground water flows and therefore we cannot fully predict what will happen when these areas have been mined and then walked away from. That is our concern.

Senator ADAMS—How is your dialogue with the mining companies going?

Ms Vernon—It is also with planning authorities. The CMA has proposed that it would be better to be looking at cumulative impacts and longer term modelling so that we have a better understanding of what the future impacts will be. A lot of the current proposals, and certainly the older ones, have not fully assessed their long-term impact. We have been critical of that process and of the fact that mining does not necessarily take into account the full range of impacts that may occur into the future. We are still arguing that there should be cumulative impact studies of areas and that the impact on ground water particularly—and surface water—is taken into account before a mining proposal gets the go ahead.

Senator ADAMS—Getting back to the planning with local governments, do you have anyone from your organisation in local government?

Ms Vernon—Our boards are not representational boards; they are merit based. We happen to have two local councillors, but they are not from the Hunter Valley. Those proposals tend to be state significant, so they are approved at the state level, not the local government level. We have discussions with the state planning departments.

Senator ADAMS—It seems like you have identified problems. But I do not know how you are driving them. I cannot get any sort of feel that you are really being able to drive these things home. You have huge problems—you have identified them. But where are you going? Are you going to your local members of parliament? Are you going to state members of parliament? What sort of process are you using to get these messages across?

Ms Vernon—We have done both of those things over time. I suppose we should put it into perspective: the catchment management authorities are very small players in the whole scheme of things. We do not have a huge amount of influence. We are working, essentially, with communities in addressing on-ground issues. The issue of mining and mining impact is a very significant issue for the Hunter and for other areas as well. We are talking with government and certainly with local members. But we are realistic. The level of influence we can have is probably not that high. We can work to try and get the best outcomes from the mining processes.

Senator ADAMS—I have one last question. Are there any other authorities that you can link up with in a partnership way to try and drive this a bit further? Can you get some peer help?

Ms Vernon—We keep working with the planning department and—

Senator ADAMS—I mean with authorities that are the same as you.

Ms Vernon—As I said, we are looking at joint projects with Hawkesbury and Nepean, which have similar issues to us. We also work with the Department of Natural Resources. They are the key partners so far as working on that goes.

Senator ADAMS—So you have a conduit to work with.

Ms Vernon—Yes.

Senator WORTLEY—Would you like to comment on how the federal government programs are operating with state and local government? Some of the submissions I have read suggest that they do not always work together. How do you find it?

Ms Vernon—Things like the Natural Heritage Trust?

Senator WORTLEY—Yes.

Ms Vernon—The way that works at the moment is through our investment strategies. It is an accredited program that has gone through a state-Commonwealth joint committee and has been signed off. We have to do reports and those types of things but the actual projects that we develop with that funding is pretty much back to us. We have contracted, basically, to deliver outputs. It might be restoring areas of salinity or planting trees or whatever it is. That is the sort of contract that we have now with the Commonwealth through the NHT funding. It is the same with things like the NLP, although they tend to be community based projects and we do not specifically manage those. That is the level of input. We then have that contract back to the state for those funds and we report on our input. We have some projects that involve local government as partners in delivering some of those activities. We have a good working relationship with local government to deliver on those programs as well.

Senator WORTLEY—With regard to the results that you get and the information that you are putting forward, do you find that there is interaction between the various levels of government?

Ms Vernon—I suppose the joint steering committee is the one that we have most dealings with as far as funding is concerned. I am not really privy to what goes on in those meetings but sometimes differences in emphasis and opinion come through.

CHAIR—Thank you. Are there any final comments you want to leave us with?

Ms Vernon—No.

CHAIR—Thanks for your time. It is probably not as big a distance to travel as from Gunnedah but nonetheless I am sure you have travelled a few kilometres to get here.

Ms Vernon—It was a train trip.

CHAIR—Trains run in New South Wales, do they? I did not realise that!

[2.44 pm]

PAVAN, Mr Neville, Catchment Coordinator, Implementation, Hawkesbury-Nepean Catchment Management Authority

CHAIR—Welcome. Thank you for your time today and for your patience in waiting. We have received your submission, which is submission No. 12. Do you want to amend or alter that in any way?

Mr Pavan—No.

CHAIR—You have probably already heard me mention about parliamentary privilege and answering anything in private if you wish. I invite you to make an opening statement and then we will open up to questions.

Mr Pavan—Thank you very much for inviting me along. Essentially, I will reiterate our submission in a moment. The geographic location of the Hawkesbury-Nepean Catchment Management Authority extends from around Palm Beach in the north-east, where it meets the ocean, back through to the Somersby Plateau and the Central Coast, along the Hawkesbury River, meeting Western Sydney and the Blue Mountains, through to south of Goulburn and out to Lithgow in the western area. The estimated economic value of agriculture in the Sydney basin is in excess of \$1 billion. That is not including the industries of grazing, vineyards and olive groves et cetera in the southern part of the catchment. The metropolitan CMA has part of Western Sydney, which I will mention when I refer to salinity in Western Sydney. I will not be referring to the metro CMA area much; just the local area.

I will go through my summary of our submission. Under term of reference (a), the key issues that the Hawkesbury-Nepean Catchment Management Authority wish to raise are data gaps—the impact of financial and legislative shortfalls. The national ground water flow system information has not been extended, and all catchments still show local and subcatchment variations in salinity processes. Even basic surface and ground water quality and flow-trend data is limited in some catchments, as in the case of the Hawkesbury-Nepean. This limits the ability to target on-ground works efficiently and effectively. These types of issues and the need to carry out investigations to fill data gaps are generally not allowed for in guidelines for funding and reporting.

Under term of reference (b), all catchment management authorities do not have the financial support to effectively manage salinity. The Hawkesbury-Nepean catchment, which includes Sydney's drinking water catchment and the rapidly expanding development of western Sydney, is not designated as a national action plan priority area. This means that the Hawkesbury-Nepean Catchment Management Authority has limited access to funding to address rural and urban salinity issues. While economic data now shows the potential cost of urban salinity, little emphasis is placed at a national level on addressing this issue.

The Hawkesbury-Nepean Catchment Management Authority has, in its investment strategy, soil and land programs to resource catchment works in degraded rural lands. These programs are

tied to targets and standards that require on-the-ground works, which do not allow investment on investigative work to explore closing the data gap to enable beneficial on-ground investment. I am reiterating the things that have been said in the Hunter-Central Rivers submission. Scope to utilise this funding in urban areas is very low.

On term of reference (c): the Australian Building Codes Board has recently issued a discussion paper relating to building in saline environments and therefore does not currently provide effective legislative requirements for new homes. Building codes place considerable emphasis on building or development in types of environments—in this case, a saline environment. Much understanding of saline environments has a heavy emphasis on agricultural terminology when defining a saline environment. Urban salinity is triggered by different parameters than those in agriculture. The lack of salinity-specific data, particularly in the urbanising areas in the Hawkesbury-Nepean catchment, enables development to proceed in potentially saline hazardous areas without recognising the saline environment. National standards for the construction of roads do not address the issue of salinity impacts on roads or the potential impact of roads on salinity processes. The National Water Initiative does not consider urban salinity hazards in programs for recycling and reuse of stormwater and grey water. They are just some of the emerging issues that we also have in those rapidly urbanising areas.

Senator WORTLEY—In your submission you note that, at a national level, there is little emphasis on the issue of urban salinity. When you were going through the information then, you raised the issue of data gap that needs to be addressed. In addition to that what, in your view, needs to be done at a national level to ensure that urban salinity can be effectively managed?

Mr Pavan—I can only speak of my understanding of where I work and have worked. Essentially, ground water flow systems, or the ground water influences on salinity, are issues that we have very little understanding of and they are data gaps. Western Sydney, for example, has a marine shale environment in the lower strata and that affects ground water, so it is saline. From the point of view of commercial usage it has not been valuable; therefore, little is known of it. We do not have a lot of background information on our ground water, because it is not being utilised. Its behaviour, whether it be a regional system or a local system, is something we have little understanding of. We have some anecdotal understanding that there is a salt load or a salt store in our soil and that wetting and drying of those soils releases salt into the landscape and into infrastructure if it has contact with it in various ways. To try to answer that from my perspective not only in terms of Western Sydney but also in the Warragamba catchment where we have a drinking water catchment, we have to have a better understanding of the ground water and hence ground water flow systems to know how to attempt to manage water for salinity.

Senator WORTLEY—That would be achieved with funding?

Mr Pavan—As the Hunter-Central Rivers Catchment Management Authority mentioned, we have a number of joint submissions around at the moment to get some funding to try to do some investigative work. We have not been able to use our investment strategy funding for those purposes because they are generally tied to on-the-ground type work. We have not targeted a lot of money in the investment strategy at salinity because we want to make sure that investment is targeted properly and there are many other issues. Certainly, salinity management is an integrated affair, so we do have some gains by investment in biodiversity and soil and land

projects. But to know where to effectively target that money and make sure it is best spent then we would need that information.

Senator SIEWERT—Following on from that, what percentage of your catchment is in the Sydney water supply area?

Mr Pavan—I am not exactly sure what percentage. It would be at least half.

Senator SIEWERT—Is the state government investing? I would have thought the state government would have been targeting investment in such an important area, since it is a water catchment, to get an idea of the catchment issues involved.

Mr Pavan—It has. Certainly through the New South Wales strategy there has been investment through some projects and also through the salt team leaders. Through the Sydney Catchment Authority, in partnership with the CMAs, formerly the Department of Natural Resources—it is essentially the state government—there is a partnership of the Catchment Protection Scheme. Strong emphasis is obviously placed on water quality. However, there is a soil and land component to achieve that water quality and that is where that is focused. Some of that funding is spent on salinity management. However, it is a bit like managing or using it on known areas and looking at scalds that are there and being able to work on those. We have not been able to strategically look at the whole catchment and target where the highest priority areas are—for example, leaky catchments versus non-leaky catchments, saline water coming from parts or whatever—so it is a matter of targeting it.

Senator WORTLEY—Following on from that, in your submission you highlight the importance of ground water flow information for well-targeted on-the-ground action at a regional level, and you further point out that the national ground water flow system information has not been extended to all catchments. In your view, who would be best placed to fill this data gap?

Mr Pavan—We would be working in partnership with the Department of Natural Resources at a state level. We have also in the past worked with the CSIRO on some projects. I am not sure who would administer or oversee it at a national level.

Senator WORTLEY—It is not about who would do it but who you think should be doing it. Do you have a view as to how the data gap could be filled?

Mr Pavan—No, I do not. Do you mean who would actually carry out the work?

Senator WORTLEY—Yes.

Mr Pavan—We would look to the Department of Natural Resources at the moment. They have some considerable expertise statewide. They have been doing it in western areas. I would see that kind of networking and information flow being able to be carried across.

Senator ADAMS—Are there other catchment management authorities? Looking at the map, to me it seems you are surrounded by them. Are they affecting you at all?

Mr Pavan—Do you mean salinity and if they are being affected by it?

Senator ADAMS—No, I mean if they are causing any effect. As they are around you, is salinity from any of the others coming down on to you or not?

Mr Pavan—No. From a hydrological catchment point of view, the Southern Rivers CMA joins us between Braidwood and Goulburn. Where we join we have similar issues in that area—and that is one of the joint projects that we have actually—

Senator ADAMS—That is really what I was getting at: how you are working with the other catchment authorities.

Mr Pavan—To add to that, the Sydney Catchment Authority's area where they actually draw water from also covers that area, so they have a Catchment Protection Scheme running there. There has been a fair bit of collaboration over the years, even prior to CMAs, and there is a fair bit of information too, but other than ground water influences, which we are not aware of because we do not have that information, from a surface catchment point of view they are not. As for the Sydney Metropolitan CMA, we have been working with it for a number of years, as we have with the former Department of Land and Water Conservation and DIPNR, in looking at the local government areas of Western Sydney.

There is a local government advisory group that the CMA sponsors. Representatives from the 22 local government areas in the whole catchment are on that committee. We are working on natural resources issues. We actually devolve funds for, at this stage, biodiversity, soil and land, and river health projects, so there is availability if there are submissions as to salinity. So we are working closely, but they do not have the information to be able to go from there. Also, we are working with a Western Sydney salinity working group, which the Western Sydney Regional Organisation of Councils—WSROC—chairs. A number of local government people have been attending that. Certainly, the Department of Natural Resources has been the main provider of information and input to that local group, but we have access to and a fair bit of communication with that group. As I said, with those catchments which we border on with someone else, there are like influences. It is a similar case with the Hunter. Our Rylstone area backs onto that area, and we have got some issues there as well.

Senator ADAMS—I was a little bit worried about the building permits on saline land. Do these other areas have that same problem?

Mr Pavan—I think they do. I might be being a bit simplistic although it is hard to simplify salinity. To my mind, there are a lot of guidelines—and we are not saying that there are all the solutions—and generally there are engineering solutions to the built environment as long as there is recognition that you are actually working in a saline environment. My concern is that when you are dealing with agriculture you have got parameters by which you can say, 'We've got a problem with salinity; it's affecting our crops and it's affecting our irrigation and water,' but when you are dealing with soil and land, when you are building a house or a road, your plants might not survive but your road will survive for another 20 or 30 years although it may break up and require extra maintenance over that period of time. So, somewhere along the line, we have to look at this: is there a ready reckoner or is there a way of being able to decide that there is a saline environment or being able to advise that there is a saline environment in urban

areas and therefore you must use the proper damp coursing, exposure class bricks, proper rating of plastic under buildings and those types of things?

Senator ADAMS—You were talking about the data gaps—that was really what I was going to ask you. Other areas obviously are having the same problem because we have already had that in submissions. So once again I think these are the things where you all have to get together and go as a really big group, shake the table and say, ‘Look, this is a problem for all of us and it is going to become worse.’

Mr Pavan—We did some work—the CMA, the Department of Natural Resources and CSIRO—in the last 12 months in that area, starting with the building environment people. When you look at a lot of the natural resource management side of things, we look at soils and soil scientists do the testing and they do the interpretation from the environmental point of view, but the engineers basically interpret things a little bit differently and look from the built environment perspective. And what they had to say was enlightening, even though we were not able to pursue the research because of time and money constraints. Basically what they were alluding to is that it is possible to have some type of a graph or something to be able to say, ‘In this area if you have this level of corrosivity or of these types of materials present in the soil then you are going to have a salinity problem.’ That is the type of thing we need to pursue in the built environment.

Senator ADAMS—What about stormwater and the use of grey water and anything along those lines?

Mr Pavan—We—and when I say ‘we’ it is a whole group of organisations and people, not just me and the CMA—had a fair bit of input into water sensitive urban design documentation and work in Western Sydney to basically advise people that the environment they have there is pretty sensitive when it comes to putting water into it: infiltration. It basically releases salts that are locked up there if you wet it, and you retain it because it is quite clayey and it will stay wet for a long time, and just lets the salts go. Because it is a reasonably heavy clay it locks up the salts and they do not move through the system very easily, so they are there; they are locked up.

When it comes to the use of grey water and reuse, in previous times when we have provided comment and input into environmental impact statements or development applications we have tried to advise people that they are dealing with a saline environment, or an environment that has a salinity issue, and that by adding grey water and recycled water, which may have a content of salinity in it—an EC level—then over a period you will have a cumulative effect that may come to a threshold where plant life or the surrounding creeks are affected. When we were dealing with golf courses, people say, ‘That’s okay, we’ll just grow salt-tolerant species.’ But it is that cumulative impact in the soil and release that we are more concerned with. I think that is being looked at and talked about now, but it is an issue that we have to keep an eye on.

Senator SIEWERT—In New South Wales do the CMAs get together—for example, the chairs?

Mr Pavan—Yes, chairs and general managers—there are two forums.

Senator SIEWERT—We found that pretty useful in WA to build a bit of a lobbying bloc. When you are doing your investment planning how do you make your decisions about how to

invest your money? How do you identify your priorities or work out what they should be in terms of getting the best bang for your buck, where you think you are going to get the maximum effect?

Mr Pavan—I have only a small involvement in it. Essentially, when we started with blueprints a couple of years ago, we drew together panels—stakeholders, if you like—which included community and local government people as well as other agency type people, and looked at issues such as biodiversity, soil and land community partnerships and also river health.

We went through the issues and brainstormed and basically came out with what we needed to do and what types of actions we needed to put in place to achieve those things. We then started working on them. A flow-on from that was that we had to put dollars and cents into them. We also identified lead agencies. Lots of organisations were already working towards those types of things. When we put costs to that—and I think at that stage it was over a 10-year period—we were able to look at where we might get to and what dollars that would cost. The CMA investment strategy was really born from that, but obviously it was changed and tightened up to fit other criteria. A lot of it was bringing together those people who were involved and looking at the issues that were very obviously a high priority in the catchment.

CHAIR—Do you have any comment about any extra things that could be done at the federal level or about things that are working well or hurdles that are in the way?

Senator WORTLEY—Suggestions.

Mr Pavan—I do know that the New South Wales agency supported the Hawkesbury-Nepean and the Hunter-Central Rivers areas with NAP funding. I cannot leave here before saying that that could be revisited and looked at. I think that is pretty important to us, particularly in our type of area. I know our catchments and the population and the types of resources that are coming out of that area. So funding is certainly important—some type of relaxation on the criteria of the funding that is available to us to be able to carry out investigative work so that we know where to target our dollars. We are very mindful of the level of accountability in meeting targets and standards across the state, but if we cannot have the work done that leads us or directs us then it is going to be very difficult to meet some of those. We will have to stick with the ones that we can do, and salinity is such a difficult one because it is such an integrated issue. They would be the main things. Other issues are guidelines in urban areas—looking at how we can bring in and unify the building codes and make sure that everyone is aware of what needs to be carried out.

CHAIR—You mentioned the building codes in your submission and said that if they were codified and people were made aware of them and they were enforced without clobbering people over the head too much, that would assist.

Mr Pavan—Sure. The local government salinity program—which is now being carried out by the Department of Natural Resources through the salinity team leader—has been state-wide and has produced and provided a lot of information for people to get a hold of. We did a short training session with some of our officers, and that type of awareness—the pictures and the explanations—is around and it is very good. People are aware that if they take shortcuts in buildings et cetera they will have a problem; it is just that we need to make sure it happens through building codes and so on.

CHAIR—Some people do still take shortcuts.

Mr Pavan—I cannot possibly comment.

CHAIR—And this range of information has been quite useful?

Mr Pavan—Yes, terrific.

CHAIR—We will note that. Thank you for your time and your participation. I also thank Hansard, the secretariat, all the witnesses and the audience. If you would like to provide any further follow-up information, please provide it to the secretariat.

Is it the wish of the committee that we accept all the exhibits we have received today? There being no objection, it is so ordered. Secondly, is it also the wish of the committee that the South Australian submission be accepted? There being no objection, it is so ordered.

Committee adjourned at 3.11 pm