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TRANSCRIPT OF PROCEEDINGS

O/N H-910732

MR B. WALKER SC, Royal Commissioner

IN THE MATTER OF THE MURRAY-DARLING BASIN ROYAL COMMISSION

ADELAIDE

10.01 AM, TUESDAY, 10 JULY 2018

Continued from 5.7.18

DAY 6

**MR R. BEASLEY SC, Senior Counsel Assisting, appears with MR S. O'FLAHERTY,
Junior Counsel Assisting**

MR BEASLEY: All right. I'm ready when you are, Commissioner.

THE COMMISSIONER: Good.

5 MR BEASLEY: Just from last week when I called Professor Lester, I indicated that
I would tender one of the reports that she was a co-author on from the Goyder
Institute which was report 11/2011 called 'Analysis of South Australia's
10 Environmental Water and Water Quality Requirements and Their Delivery Under the
Guide to the Basin Plan'. That has become exhibit RCE69. What I didn't tender
was the subsequent work she did as a co-author of a report for Goyder, which was
number 13/2 of 2013 which is entitled 'Assessing the Impact of Volumes Proposed
Under the Draft Basin Plan on the Coorong and Murray Mouth Region'. So I will
tender that report which was behind, I think, tab 7 in what was called the Rebecca
Lester Brief.

15 Professor Lester also gave some evidence about the setting of South Australia's
environmental watering requirements, which was slightly different to the Basin
Authority's watering requirements for the Lower Lakes, Coorong and Murray
Mouth. She referred to a 500-page report – I'm not sure whether Mr O'Flaherty is
20 on top of that report yet but no doubt he is. But there was an 80 page summary of it
in the Rebecca Lester brief. I will tender that for the time being. That is a report
dated June 2011, 'Lower Lakes and Coorong recovery specifying an environmental
water requirement for the Coorong and Lakes Alexandrina and Albert: a first
iteration'.

25 I tender that report. Just before we get to the witnesses, many times I have referred
to the Menindee Lakes supply measures and during the course of opening, I think I
read from the Basin Authority's analysis of the New South Wales government's
business case for the Menindee Lakes reconfiguration or what's called the Menindee
30 Lakes Water Saving Project. The MDBA analysis that we were able to obtain
because it was produced to the Senate is exhibit RCE51. The business case has now
been made publicly available. It's entitled 'Menindee Lakes Water Saving Project
Phase 2 Business Case J, June 2017, New South Wales Department of Primary
Industries'. I will tender that.

35 I think for the time being, they are – there's other documents suggested to me to be
tendered in relation to that project but I'm not convinced they need to be at the
moment. So I will just tender that business case.

40 THE COMMISSIONER: Thank you.

MR BEASLEY: That brings me to the four witnesses we have here today who are
members of the Wentworth Group. They will need to be sworn. After they're
sworn, I will take some biographical details from each of them, but the first thing I
45 need to do after that is just take some clarifying evidence from Mr Cosier from when
he last gave evidence before you.

<JAMIE PITTOCK, AFFIRMED [10.05 am]

5 **<CELINE STEINFELD, AFFIRMED** [10.05 am]

<PETER COSIER, AFFIRMED [10.05 am]

10 **<BRUCE THOM, AFFIRMED** [10.06 am]

MR BEASLEY: Thank you. Commissioner, just as in terms of the protocol that is going to be adopted, it has been decided I will address at least in the first instance, 15 questions to Professor Pittock, and, of course, in relation to any of the questions I ask, any of the witnesses are free to answer if it's within their area of knowledge or expertise, but I've asked them to identify themselves as they answer so that will be clear on the transcript and no doubt there will be some slip-ups with that but there's enough people in the room to make prompts to make sure that goes smoothly.

20

Professor Pittock, you are an Associate Professor in the Fenner School of Environment and Society at the Australian National University.

25 ASSOC PROF PITTOCK: Yes, I am.

25

MR BEASLEY: And you teach courses on environment and society as well as on climate change adaptation?

30 ASSOC PROF PITTOCK: Yes, that's correct.

30

MR BEASLEY: Can you tell the Commissioner your qualifications?

35 ASSOC PROF PITTOCK: I have a Bachelor's degree with Honours in environmental science and I have a Doctorate from the Australian National University in environmental policy looking at water management and climate change.

40 MR BEASLEY: And you've been, from 2001 to 2007 a director of the World Wildlife Fund's global freshwater program?

40

ASSOC PROF PITTOCK: Yes, I was.

45 MR BEASLEY: And you've been – you're still a scientific adviser to the World Wildlife Fund Australia?

45

ASSOC PROF PITTOCK: Yes, I am.

MR BEASLEY: Scientific adviser in what area?

ASSOC PROF PITTOCK: I chair the eminent scientist's group of WWF Australia which provides advice on the full range of WWF's programs ranging from
5 conservation of biodiversity through to climate change.

MR BEASLEY: All right. And amongst other things you've done you have directed resources in relation to sustainable water management in the Murray-Darling Basin.
10

ASSOC PROF PITTOCK: Yes, I have extensively undertaken research on the management of water in the Murray-Darling Basin in terms of conservation of biodiversity, in terms of options for enhanced management for people and the environment and in terms of climate change adaptation in water management.
15

MR BEASLEY: And you've been a member of the Wentworth Group since 2016?

ASSOC PROF PITTOCK: Yes, that's correct.

MR BEASLEY: All right. Dr Steinfeld, which is S-t-e-i-n-f-e-l-d, you've been a member of the Wentworth Group since 2015.
20

DR STEINFELD: I'm currently in the secretariat of the Wentworth Group.

MR BEASLEY: All right. Can you tell the Commissioner your qualifications?
25

DR STEINFELD: I have a Bachelor of Science in Geography with Honours and also a Doctorate in geography from the University of New South Wales.

MR BEASLEY: Was your PhD research in sustainable river management?
30

DR STEINFELD: Yes, it was.

MR BEASLEY: From the University of New South Wales?
35

DR STEINFELD: Yes.

MR BEASLEY: And you were the inaugural recipient of New South Wales Peter Cullen Postgraduate Scholarship in 2009?
40

DR STEINFELD: Yes.

MR BEASLEY: What work have you been involved in since obtaining your PhD?

DR STEINFELD: Since my PhD I spent seven months working at the Murray-Darling Basin Authority in the environmental management division as a policy officer.
45

MR BEASLEY: What did that involve?

DR STEINFELD: That involves supporting the team developing the basin-wide environmental watering strategy.

5

MR BEASLEY: Is that chapter 8 of the Plan?

DR STEINFELD: It's part of chapter 8 of the Plan.

10 MR BEASLEY: And what year was that, that seven months?

DR STEINFELD: 2013.

MR BEASLEY: All right. And since then?

15

DR STEINFELD: Since then I have been working at the Wentworth Group of Concerned Scientists.

MR BEASLEY: All right. Thanks. Now, I might skip Mr Cosier because I want to come back to him. Professor Thom, you are a founding member of the Wentworth Group?

20

PROF THOM: That's correct.

25 MR BEASLEY: And you are an Emeritus Professor at the University of Sydney?

PROF THOM: Correct.

MR BEASLEY: Former Chair of the Coast and Climate Change Council?

30

PROF THOM: Correct.

MR BEASLEY: Founding President of the Australian Coastal Society?

35 PROF THOM: That's correct.

MR BEASLEY: Former Chair of the Australian State of the Environment Committee?

40 PROF THOM: 2001.

MR BEASLEY: Yes. And can you tell the Commissioner your qualifications, please.

45 PROF THOM: I have a Bachelor's degree at Sydney University, a PhD from Louisiana State University.

MR BEASLEY: In?

PROF THOM: Coastal studies.

5 MR BEASLEY: Can you provide some of your background work history for the Commissioner?

10 PROF THOM: Well, I started in 1960 exploring the coasts of New South Wales and the rest of the world, particularly through my work in the US and in Australia, and I continue to do so.

MR BEASLEY: Has your work been in academia or - - -

15 PROF THOM: Up to 1989 I focused entirely on academic work, with one exception. I appeared before the 1975 Inquiry into Fraser Island at length, presenting detailed scientific evidence on the sand dunes.

20 MR BEASLEY: You would have to refresh my memory about that. What was that about?

PROF THOM: The Fraser Island Inquiry was an inquiry instituted by the Federal Government under Whitlam to look at sand mining on Fraser Island, the extraction of rutile and zircon. It was an interesting one because the Queensland Government refused to participate in the inquiry and Fraser - - -

25 MR BEASLEY: Was that Bjelke-Petersen, was it?

PROF THOM: It was Bjelke-Petersen.

30 MR BEASLEY: A bit like the MDBA now.

THE COMMISSIONER: Now, now.

35 PROF THOM: And then when, of course, Malcolm Fraser became the Prime Minister he banned the export of rutile and zircon and Fraser Island is now world heritage.

40 MR BEASLEY: Now, Mr Cosier, you are also a founding member of the Wentworth Group.

MR COSIER: That's correct.

MR BEASLEY: Can you tell the Commissioner your qualifications?

45 MR COSIER: I have a Bachelor of Science degree and a Diploma in urban and regional planning.

MR BEASLEY: You were Deputy Director-General in the New South Wales Department of Infrastructure, Planning and Natural Resources?

MR COSIER: That's correct.

5

MR BEASLEY: What years was that?

MR COSIER: 2003 to 2005.

10 MR BEASLEY: You were the senior policy adviser for Senator Hill when he was the federal environment minister?

MR COSIER: I was one of four policy advisers, yes.

15 MR BEASLEY: What years was that?

MR COSIER: That was 1997 – 1996 to 2001.

MR BEASLEY: You are currently the executive director of the Wentworth Group.

20

MR COSIER: That's correct.

MR BEASLEY: How long have you been the Executive Director of the Wentworth Group?

25

PROF THOM: Well, the Wentworth Group formed in 2002 informally and we formalised the organisation in 2005.

MR BEASLEY: And you have held that position since then?

30

PROF THOM: Filled that position since.

MR BEASLEY: I want to ask you some questions about the Wentworth Group. You just mentioned it was formed informally in 2002. Can you tell me, why is it called the Wentworth Group, for a start?

35

MR COSIER: Well, I believe there has been three peer reviewed academic papers that have answered that question. Most of them have got it wrong.

40 MR BEASLEY: Right.

MR COSIER: We met in a hotel in Sydney called the Wentworth Hotel.

MR BEASLEY: The Wentworth Hotel. You need to be called the Sofitel Group now.

45

MR COSIER: That's right.

MR BEASLEY: We will stick to Wentworth Group. And what's the primary objective of the group?

MR COSIER: Well, the core - - -

5

MR BEASLEY: Or objectives.

MR COSIER: The genesis of the group came from my experience in Senator Hill's office where we found – both myself and the Senator, the Minister – it very difficult to get cohesive scientific advice that had a public policy context. And so the genesis of the Wentworth Group was that I knew from my experience with Hill that there are many, many scientists in Australia that are capable of doing that but there's no institutional framework for that to happen. So that really was the genesis of the Wentworth Group, to connect science to public policy in Australia.

15

MR BEASLEY: The first publication from the Wentworth Group, I think, which came out in November '02 is 'Blueprint for a Living Continent'.

MR COSIER: That's correct.

20

MR BEASLEY: What was the background to that?

MR COSIER: The background to that was Australia had entered one of its drought periods. There was controversy over the drought. There was – Telstra at the time launched an appeal to help farmers who were struggling in the drought. In that launch, they invited Alan Jones to launch the appeal but unbeknownst to everybody, Alan Jones proffered the solution to drought proofing Australia which is to divert Australia's coastal rivers inland. And we looked aghast at that suggestion because that had been tried many times over the last 200 years and we felt that science - - -

30

MR BEASLEY: Mr Jones is not on our expert list for some reason but perhaps we need to add him.

MR COSIER: Perhaps you need to consider that. We felt that science needed to stand up and put a case that, why that wasn't going to work and what the alternative solutions were and hence the genesis of that first blueprint.

35

MR BEASLEY: All right. And that was soon followed by a 'Blueprint for a National Water Plan', which came out in July '03.

40

MR COSIER: Yes. Unbeknownst to us, the first blueprint attracted a great deal of attention both from the Deputy Prime Minister at the time, John Anderson, and also from the New South Wales premier, Bob Carr. And they both met with us and asked if we would be interested in assisting them with some major policy reforms and the water – the national water initiative which John Anderson was the leader in.

45

MR BEASLEY: Started in '04, I think.

MR COSIER: It was signed in '04 but it started in late '02, the process we first met John in late '02 and we were very pleased and honoured to be asked to assist in that process.

5 MR BEASLEY: And publications concerning the progress of both the Water Act, the draft Basin Plan and subsequently the Basin Plan and the recent adjustment to is SDL adjustment to it and also the proposed amendment for the Northern Basin Review are matters upon which the Wentworth Group has since 2003 published various papers.

10 MR COSIER: That's correct.

MR BEASLEY: Expressing various opinions.

15 MR COSIER: That's correct.

MR BEASLEY: And those papers have been, I assume, the joint work of the various scientists that are members of the Wentworth Group and some of whom are assisting in a particular time or are associate member.

20 MR COSIER: Yes. The logic behind that is that science has very strong disciplines, and we're dealing with an ecological system which is highly complex. So our method is to get the best scientists that are available to help us with those issues and to synthesise all that scientific advice into a coherent package that public
25 policymakers can make sense of.

MR BEASLEY: All right. And for the purposes of this Royal Commission, the Wentworth Group has made a submission dated 21 May 2018.

30 MR COSIER: That's correct.

MR BEASLEY: All right. I will tender Wentworth Group of Concerned Scientists submission to the Murray-Darling Basin Royal Commission dated 21 May 2018. I'm going to come back to that, though. I don't want to deal with that submission to
35 begin with. In fact, before we start discussing some of the publications of the Wentworth Group concerning the Basin Plan, that I want to hear your views on or some clarifications on, can I just take you back, Mr Cosier, to some of the evidence you gave, I think, on 27 June in relation to the witness statement you provided us. And I think you will recall I asked you whether you could recall or had a record of
40 various meetings that you went to of what was called the Basin Testing Committee. Do you recall that?

MR COSIER: Yes, I do.

45 MR BEASLEY: That was the committee that Mr Knowles, who had become the new chair of the MDBA, had asked you to, with others, to participate on.

MR COSIER: That's correct.

MR BEASLEY: Largely concerning the unhappy reaction to the Guide in parts of the Basin communities.

5

MR COSIER: That's correct.

MR BEASLEY: And you indicated you would like to check your diary. I will just go through these transcript references for the sake of the transcript now. There's no need for these to be turned up, I don't think, Commissioner, unless you particularly want them.

10

THE COMMISSIONER: No.

MR BEASLEY: I asked whether – this is at transcript one to 23, I asked Mr Cosier whether he had a record of a first meeting in April 2011. He said he would like to check and that there might have been an earlier one. I also – Mr Cosier also gave evidence where there was a meeting with people from KPMG who had done some work in relation to whether a plan of a 4,000 gegalitre recovery of water for the environment was possible and KPMG at this particular meeting said that it wasn't because regional communities would never have it. And I asked throughout the course of transcript 208 through to 217 where that meeting was and when it was and Mr Cosier was uncertain and wanted to check his records. You have since sent an email to Joanne Masters, the Senior Instructing Solicitor for the Commission about checking your diary.

20

25

MR COSIER: That's correct.

MR BEASLEY: And you have a diary entry for a meeting in Sydney on 14 December 2010 at 6 pm at Investig office in Sydney.

30

MR COSIER: Correct.

MR BEASLEY: Another diary entry for a meeting 22 February 2011 at 5 pm in Investig office in Sydney.

35

MR COSIER: Correct.

MR BEASLEY: And you think it is one of those two meetings where KPMG was talking about a 4,000 gegalitre plan - - -

40

MR COSIER: That's correct.

MR BEASLEY: - - - won't fly. You're not sure which of those two dates, though.

45

MR COSIER: If I was asked to favour one or the other, I would suggest it was 14 December.

MR BEASLEY: Being the first ever – I think you said it might have been an informal meeting of the Basin Testing Committee.

5 MR COSIER: I believe that was an informal meeting to see whether people were interested in participating in the Basin.

10 MR BEASLEY: You have two other diary notes for dates of attending what you think were formal meetings of the Basin Testing Committee and they were 25 March 2011 at KPMG's offices in Sydney.

MR COSIER: Correct.

15 MR BEASLEY: And another meeting at the MDBA's offices in Canberra on 7 April 2011.

MR COSIER: That's correct.

20 MR BEASLEY: And it was following that you had, for the Wentworth Group, asked Mr Knowles for the Basin Authority to agree to an independent scientific panel to determine the SDLs or sustainable level of take.

25 MR COSIER: So, on the meeting of 7 April, is the meeting I referred to in my earlier evidence, as to when we received The Weekly Times article. So it was the meeting of 7 April.

30 MR BEASLEY: So that article was in relation to – and you provided us with where it was reported that the Commonwealth officials were asking their Victorian counterparts whether a plan of recovery for water for the environment at either about 2,200 gigalitres or 2,400 gigalitres would be acceptable to them.

MR COSIER: That's correct, yes. So it was at that meeting that I tabled that press clip, and the proposal for an independent panel was a result of that, which we – which I sent to Craig Knowles on 8 April.

35 MR BEASLEY: Yes. And that wasn't agreed to?

MR COSIER: That's correct. That was not agreed to.

40 MR BEASLEY: And the Wentworth Group lost confidence that the ESLT would be determined on the best available science and hence you resigned from that testing committee?

45 MR COSIER: Yes, I formally resigned on 4 May in a letter to Craig Knowles setting out our reasons and attaching a copy of that proposal for an independent scientific review.

MR BEASLEY: I will just get that followed up at morning tea. If those documents haven't been tendered then, I will tender them. We can move on for the time being while that is checked.

5 THE COMMISSIONER: Thank you.

MR BEASLEY: Now, does everyone have a copy of the Wentworth Group Concerned Scientists brief or is there just one copy? There's one, okay. Well, we will give it to Professor Pittock first and see how we go from there. I'm just
10 wondering, Professor Pittock though, in relation to any questions I have about this 'Blueprint for a National Water Plan' which is a 31 July 2003 document but it might be better if I direct my questions to Mr Cosier in relation to that particular document.

ASSOC PROF PITTOCK: Yes, I agree.
15

MR BEASLEY: All right. Can you just pass that volume to – Commissioner, do you have a copy of this volume?

THE COMMISSIONER: Yes, I do.
20

MR BEASLEY: If you just go to behind tab 2 of, you've got your own copy, I take it, of this?

MR COSIER: Yes, I do.
25

MR BEASLEY: All right. Well, feel free to use that if you want but behind tab 2 can you check for me you have the 'Blueprint for a National Water Plan'.

MR COSIER: That's correct.
30

MR BEASLEY: Wentworth Group of Concerned Scientists.

MR COSIER: Yes.

MR BEASLEY: Now, obviously, that was a blueprint prepared four years before the enactment of the Water Act and nine years before the Basin Plan. Don't nod, say yes or no.
35

MR COSIER: Yes.
40

MR BEASLEY: Yes. Sorry about that. We just need it to be recorded for the transcript. But in effect it was calling for something like a plan that has ultimately become the Basin Plan.

MR COSIER: Yes. So I'm not sure how much history you would like me to give but I will give you a bit of a brief history.
45

MR BEASLEY: Please do.

MR COSIER: Subsequent to our meeting or meetings with the Deputy Prime Minister, we felt.

5

MR BEASLEY: So you had met with Mr Anderson before this was published to discuss the concerns the Wentworth Group had about planning in relation to the water resources of the Murray-Darling Basin.

10 MR COSIER: Yes, in fact I wouldn't use the word concerns at that time. I would use the word "opportunities" because – and as you will see from the history of our writings up until 2008, we were very, very positive about the possibilities of water reform in Australia. The reasons for our positive attitude was really the attitude of John Anderson and the Howard government in general in seeing an opportunity to
15 both modernise irrigated agriculture and also use the same process, what you would call an industry development process to restore over-allocated rivers.

MR BEASLEY: They recognised that the system had been over-allocated.

20 MR COSIER: Very definitely. They also realised there were some economic opportunities if we got the process right that we could achieve a win-win outcome which was a healthy river and a more productive and efficient irrigated agricultural industry in Australia.

25 MR BEASLEY: A healthier river presents its own opportunities for economic benefits.

MR COSIER: That's correct.

30 MR BEASLEY: Tourism.

MR COSIER: Economic benefits for irrigated agriculture, for other industries such as tourism for the towns and cities along the river systems and for the environmental assets such as Ramsar sites, threatened species and other matters. The opportunity
35 arose because the possibility was to convert annual water entitlements which had a very great uncertainty for irrigators into permanent titles, and also to then allow those titles to be traded to their best and highest use. So that would, in our opinion at the time – and I think history has shown to be correct – drive innovation in agriculture so you get far more economic wealth from the same volume of water. In the same
40 process, as part of that process some of the water could be returned to the environment and overall the vision was there would be a net benefit to the economy and a net benefit to the environment.

45 MR BEASLEY: Just in relation to this particular document, over the page, it lists the members of the Wentworth Group at the time. With you as an environmental policy specialist for World Wildlife Fund Australia, foundation of Australia at the time. Dr Williams, who has already given evidence to us, and at the time must have

been the Chief of Land and Water of the CSIRO, and Mike Young, resource economist, Director of Policy and Economic Research, CSIRO and University of New England. Is Professor Young – I'm not sure we have been able to contact him. Do you know where he is at the moment?

5

MR COSIER: I was asking the same question this morning. I have to confess unfortunately I don't know where Mike is at the moment.

MR BEASLEY: All right. If you find out, can you let us know?

10

MR COSIER: We can take that on notice.

MR BEASLEY: And Professor Thom, you were a member of the group at the time?

15

PROF THOM: That's correct.

MR BEASLEY: Was this report a joint report of everyone listed there or did someone take the lead in relation to this particular blueprint?

20

MR COSIER: It was a joint report so at the time just to put it in context, the Wentworth Group was essentially running on volunteer support.

MR BEASLEY: Just stop there, there's something I forgot to do. The Wentworth Group is an independent group, independent of government.

25

MR COSIER: Yes. So we have never received or asked for money from government.

MR BEASLEY: And you obtain your funding from, I think the Purves Environmental Group or the bulk of your funding.

30

MR COSIER: Yes, three funding sources but two primary funding sources, the Purves Environmental Fund who is from Sydney, is the core funding. We have also received substantial financial support from the Ian Potter Foundation in Melbourne. And some minor donations, apart from that.

35

MR BEASLEY: I interrupted you or had you completed what you wanted to tell me?

40

MR COSIER: Well, as I said, we had a new innovative technology in 2003. It was called email. And the only way we could effectively operate in those days was for each member to write their thoughts on an email and email it to me and my job was to synthesise all those reports and produce a coherent document. The core to our – our belief was we had to strip out the scientific jargon from what we were saying so the policy-makers who are not scientific experts would understand what we were saying. So we made these reports as thin and simple as possible but as I am sure Professor Thom can attest we stressed over every single word in those reports to

45

make sure that we achieved the scientific integrity of what we're saying but also communicated in a way that policy-makers could understand what we were saying.

5 MR BEASLEY: Can I just ask you a couple of things?

PROF THOM: May I answer?

MR BEASLEY: Of course. You can, any time, jump in.

10 PROF THOM: Thank you. Firstly, Mr Cosier stressed emails but the real substance of the discussions was phone hook-ups. I recall, I think, we had for that national water initiative, that particular blueprint, something of the order of 27 phone hook-ups amongst members. So it really was a collective activity. And the late Professor Peter Cullen was very instrumental. Peter Cullen was also on the State of the
15 Environment committee that I chaired between 1998 and 2001. And we ran that State of the Environment committee - - -

MR BEASLEY: What was his expertise?

20 PROF THOM: He was a freshwater ecologist at the University of Canberra. He died in 2008. And the State of the Environment committee ran in parallel with the land and water audit which no longer exists but the State of the Environment committee report is a requirement under the Act for reporting every five years. And in that process – and it came to be documented in the State of the Environment 2001
25 – the question over-allocation of waters in the Murray-Darling Basin and the impact of that on the ecological system. So that, in fact, I think my association with SOE in 2001 – where I was appointed by Senator Hill to that particular committee – led me to be associated with Mr Cosier and through that, myself and Professor Cullen, we became members of the Wentworth Group. So there is a historical linkage that goes
30 back prior to the establishment of the 2002 foundation of the Wentworth Group.

MR BEASLEY: All right. Thank you. Had you completed what you wanted to say?

35 MR COSIER: Just to follow up on what Professor Thom was saying. The original members of the Wentworth Group were almost - - -

MR BEASLEY: This is Mr Cosier talking.

40 MR COSIER: Mr Cosier.

MR BEASLEY: Sorry, yes.

45 MR COSIER: Were people that just – we were able to contact over a weekend to have, to meet in Sydney for that meeting. The first few blueprints were written by the members as myself and Professor Thom has described. In fact I do recall the last hook-up we had on this went for about six hours because we were determined not to

leave the hard questions to the politicians. It's an easy cop out for people to say they should sort that bit out. And we felt that we had an obligation to deal with that. Subsequent reports that you will be referring to later, you will see there's a lot of associate authors as part of that process. So as we built our confidence in what we were doing, we then sought and garnered further support from other experts and they assisted us in a similar process in the following blueprints that we were writing.

MR BEASLEY: All right. Thank you. Can I just ask you to turn to page 9 of this blueprint document? And the left-hand column in the paragraph above Outcomes is the comment:

The best available science suggests that achieving a healthy River Murray system will require between 2,000 gigalitres and 4,000 gigalitres of new environmental flows and profound changes in river management to have a moderate to high chance of achieving success.

This is obviously early days. That footnote leads to a report by Jones et al 2002 called 'Expert Panel Report to the Murray-Darling Basin Ministerial Council on the Environmental Flow Requirements for the River Murray System'. Do you know any background to that report? I don't think it's a report that has been made available to the Commission yet. It may be one we need to get. But was the basis for the expression of the view 2,000 to 4,000 gigalitres for a moderate to high chance based entirely on that Jones et al report?

MR COSIER: Yes but my recollection – Professor Thom might be able to recall as well – that report also cited the references that were available at the time on river ecology and river system health. It was a new science then.

MR BEASLEY: Sure.

MR COSIER: So a lot of people think that this science was resolved, you know, 200 years ago. It wasn't. It's still being resolved. And at the time, the best available science was that report which, as I recall, was the synthesis of the scientific knowledge at the time.

MR BEASLEY: All right. The only other thing I wanted to ask you about this publication, is at page 16 and the paragraph commencing "Governments have a responsibility". So:

Governments have a responsibility to repair the mistakes of the past and should therefore provide funding to recover environmental water and support the transition to sustainable water use. Public funding should not however be used to provide windfall gains to existing entitlement holders who are not genuine water users, such as people holding on to sleeper licences.

By the term "sleeper licence", you're referring to people that hold a water entitlement but don't extract the water.

MR COSIER: Yes, that's correct.

MR BEASLEY: For consumptive use. Have I got the concern correct there, that
5 this is a concern even back in 2003 of a plan that won't achieve what it's supposed to
achieve if money is spent buying water from water entitlement holders that isn't
actually being used for consumptive use?

MR COSIER: Yes, in fact it went further than that. So if – the philosophy was to
10 convert annualised entitlements into a permanent property right and that conversion
was converting entitlements rather than water use. You would effectively be giving
away water that didn't exist which would be then entering the market. So it would
be counterproductive to the entire purpose which is to reduce the consumptive use of
water that would have led to an increase in consumptive water.

15 THE COMMISSIONER: That follows from there being over-allocation.

MR COSIER: And in some catchments massive over-allocation, both groundwater
and – sorry, both river water and groundwater systems.

20 MR BEASLEY: Thank you.

MR COSIER: If you would like the history of that, the brief history of that was - - -

MR BEASLEY: No. Please go ahead. Yes.
25

MR COSIER: - - - in the 1970s and 80s there was a philosophy that we wanted to
develop the Murray-Darling Basin and the method for doing that was to encourage
farmers who bordered these river systems to take a water entitlement and then
develop their property for irrigated agriculture. So they basically handed out
30 entitlements without any real science behind what we now know is the impact that
that would have on the health of the river system.

MR BEASLEY: All right. Thank you. I will just put it on the record again that if at
35 any stage any of the four witnesses feel that they have something useful to contribute
to either a question I ask or a topic that is raised, they can feel free to jump in at any
stage.

THE COMMISSIONER: When do you date over-allocation from? I know it won't
40 be exact.

MR COSIER: Well, in fact if we refer to our submission, figure 2, you will see the
rapid acceleration of allocation in Victoria from 1970 onwards. And then in New
South Wales.

45 MR BEASLEY: Figure 2 is on page 4.

THE COMMISSIONER: So annual diversions in the Murray-Darling Basin.

MR COSIER: Yes. So if you go to figure 2 on page 4, the red line – sorry, if you look at Victoria, there was a slow increase of consumptive use of water, a steady – a steady increase up to the year 2000. The key shift that happened within the river system was in – between 1960 and the mid-1970s where there was a massive
5 increase in water consumption from New South Wales.

MR BEASLEY: So that is from about a 1,000 giganlitres right up to in that period nearly 6,000, if I'm reading it right, the graph right?

10 MR COSIER: That's correct. So in simple terms, because that's my job, 1920 we were taking about 2,000 giganlitres out of the river systems. By 1950 we were taking 4,000 giganlitres. By 1970 - - -

MR BEASLEY: You are now looking at the thick black line at the top.
15

MR COSIER: Yes, the thick black line. By the 1970s we were taking 8,000 giganlitres and by the year 2010 we were taking 12,000 giganlitres. We have gone from two to four to eight to 12 in a period of about 100 years.

20 MR BEASLEY: All right. Thank you. I was now going to turn to - - -

MR COSIER: Could I just also - - -

MR BEASLEY: Yes, please.
25

MR COSIER: - - - suggest in answer to those questions about volumetric and hydrology, I know you have already heard from Dr John Williams but John certainly would have great expertise in that area if you have further questions on that.

30 MR BEASLEY: Sure. Thank you. Now, if Professor Pittock wants to take over at any time, he can let us now. I'm now turning to the report behind tab 3. Sorry, Professor Thom, did you go to say something?

PROF THOM: No.
35

MR BEASLEY: No. All right. Just checking. A report entitled 'Sustainable Diversions in the Murray-Darling Basin, an Analysis of the Options for Achieving Sustainable Diversion in the Murray-Darling Basin', June 2010. This report is said to be – well, first of all, in relation to – over the page it has the list of people that are
40 members of the Wentworth Group. And then again it has six people who are said to be in association with the Wentworth Group commencing with Professor Grafton. Was this report a collaboration of everyone, both the Wentworth Group and the people in association with?

45 MR COSIER: That's correct, yes.

MR BEASLEY: And was the process similar to the one that you described before for the blueprint, that is, emails and phone hook-ups?

5 MR COSIER: Yes, it was. With the one addition was we actually had funding to employ a professional at the time and that was Mr Stubbs.

MR BEASLEY: Mr Stubbs, was it?

10 MR COSIER: Yes. So Tim worked full-time working with the other people mentioned on that page.

MR BEASLEY: What area was he working on?

15 MR COSIER: Tim was basically the convenor of that report.

MR BEASLEY: Right. Okay. Does the report therefore reflect mainly his work or would that be overstating it and it was still a collaborative effort?

20 MR COSIER: It was, like all Wentworth Group reports, very much collaborative. While someone might do the bulk of the writing the content of the writing was very definitely a collaborative exercise between all the authors.

25 MR BEASLEY: All right. Who was the main author of this report, if I can put it that way, in terms of the writing?

MR COSIER: The person who wrote the most words would have been Tim Stubbs.

MR BEASLEY: Right. But with everyone contributing in some way at some time.

30 MR COSIER: Very definitely. Well, not everyone in the Wentworth Group. For example, Professor David Karoly would have been providing advice on climate change. So each member would have been providing their expertise and not necessarily overseeing the entire report.

35 MR BEASLEY: No. Understood.

40 PROF THOM: We do have more of an in-house kind of peering – reviewing of what others write. In more recent years, I am one of the very fortunate people who is able to go into the office and spend time in the office because I live close by in Sydney. So it does give me, if you like, more of a responsibility for doing some editing type work and in more recent blueprints I have done a fair bit of editing work so I have an oversighting role along with Mr Cosier. Other members, as Mr Cosier said, are consulted as per a mechanism but some of us put more into it because we have, in my particular case, more time on my hands to be able to contribute and it's a
45 great pleasure to be able to work with all those concerned in this work.

MR BEASLEY: Thank you. So this report, obviously given its date, June 2010, postdates the enactment of the Water Act but is before – shortly before the Basin Authority published the Guide to the Basin Plan in late 2010.

5 MR COSIER: That's correct, yes.

MR BEASLEY: Can I just ask you some questions about, first of all, at page 1 on the summary, there is an expression of opinion as to how much water is needed for the environment. The view expressed is approximately 4,400 gegalitres, which
10 represents approximately 40 per cent of the current cap on diversions. Whose work was that primarily to reach that figure?

MR COSIER: Right. That, I'm not certain in giving the answer.

15 MR BEASLEY: The footnote doesn't help.

MR COSIER: Yes. Thanks – if you turn to page 13, yes. We refer to a 2002 report by the then Murray-Darling Basin Commission which stated that its expert reference panel had concluded that, and I quote:

20

There is a substantial risk that a working river will not be in a healthy state when key ecosystem level attributes of the flow regime are reduced below two-thirds of their natural level.

25 MR BEASLEY: I was going to come to that. I think Professor Williams may have said that it's sort of a rule of thumb that two-thirds flow is needed to start getting some environmental or ecological benefits in terms of restoring from a without development flow regime. Does anyone - - -

30 MR COSIER: This is pre the Guide and, again, there wasn't much work done between the report we referred to earlier from Jones et al in 2002. This is pre the Guide and so that was the rule of thumb that we had available. Where the Guide made the difference – and I'm sure you're going to come to that - - -

35 MR BEASLEY: I am.

MR COSIER: - - - is where there is a substantive shift from general scientific understanding to more precise measures of ecosystem health.

40 THE COMMISSIONER: Is this rule of thumb of two-thirds, is that derived from a global understanding?

ASSOC PROF PITTOCK: This is Associate Professor Pittock. Yes, Commissioner, that's right. There's an informal and poorly documented consensus
45 among researchers, professors working in this field globally that that is a very crude rule of thumb. I would emphasise a very crude rule of thumb. And that is really a starting point to then undertake some more context specific science to look at how

much water is required to sustain particular ecological values that might then refine that number.

5 THE COMMISSIONER: Rivers are notoriously variable, not just by fluctuations in climate - - -

ASSOC PROF PITTOCK: Yes.

10 THE COMMISSIONER: - - - but some of them simply because of what I will call the geography. So they break their banks in the spring melt and they recede by the end of summer, in many parts of the world.

ASSOC PROF PITTOCK: That's true.

15 THE COMMISSIONER: Some might actually cease to run routinely. Isn't that right?

ASSOC PROF PITTOCK: That's true.

20 THE COMMISSIONER: What do we mean, two-thirds of, the consistent observable range of levels over a whole run of seasons or what?

ASSOC PROF PITTOCK: Yes, that would be the implied measure.

25 MR BEASLEY: As an average – without development average.

ASSOC PROF PITTOCK: Without development average and maintaining the timing and the volume, the pulses of flow down a river system.

30 THE COMMISSIONER: Two-thirds seems awfully neat.

ASSOC PROF PITTOCK: It is awfully neat and no scientist would say it's good enough. I think any scientist would say it needs to be developed with further research to make it more context-specific.

35 MR BEASLEY: I think we will get to the Guide but I think the Guide expresses a view that 60 to 80 per cent has a moderate chance of – or is considered a moderate benefit and 80 per cent or more is good in terms of returning a system from without development.

40 THE COMMISSIONER: I just wanted to pursue an earlier answer. Is my understanding correct that two-thirds doesn't guarantee health but approaching and dropping below two-thirds is an alarm signal?

45 ASSOC PROF PITTOCK: That's correct. So two-thirds hypothetically might not be enough to keep the mouth of a river system open. There might not be enough water to wash the sand off the mouth. It might be enough to get water out of a river

channel onto floodplain forest. So different elements of the ecology might be adequately sustained with two-thirds of the flow but some may not. Some key functions may not, and that's where the context specific research is required.

5 PROF THOM: Your points about geographies and variation of types of river systems was very much in our minds when we had the discussion for this particular blueprint because – and if you look at figure 1 of our submission where you see the variation in flow that we have for the system, you realise that Australian – this type of system in Australia is highly variable. And understanding that variability is
10 critical to much of our thinking, as you probably – as we move through our submissions.

THE COMMISSIONER: I have gathered that. And in particular, as a layman in the area, it makes me despair of my capacity intuitively to grasp the idea of a long-term
15 average when I see such extraordinary variability which is natural.

PROF THOM: Commissioner, you are speaking words of wisdom to me because this is exactly what I've been arguing with my colleagues and debating with my colleagues as we progress through the discussion today because this whole concept
20 of working from averages has been a bone in my side. And it's simply because of the nature of our river flows and our river system, well documented by geomorphologists and geographers over many, many years and when we come to discussing later what is called best available science I am sure we will elucidate you further on this, if you wish.

25 THE COMMISSIONER: Just to jump ahead, when I look at the environmental water requirements, the prospects of satisfying which underlay decisions that ultimately produce the sustainable diversion limits, quite a few of them are expressed in terms of the frequency over a period, measured in years, not months. So a set of
30 seasons. The frequency of events such as breaking the banks or breaking the banks for more than a month, etcetera, etcetera, is that the kind of nuance that you are saying is preferable to an averaging process?

PROF THOM: In that context very much so. And in the context, as Mr Cosier has
35 indicated, we have now within the Wentworth Group Professor David Karoly who is very, very clear in his understanding of the various shifts in climatic conditions that occur, say between El Niño and La Niña type periods and the relationship of this to frequencies, frequencies of flooding and frequencies of droughts and the occurrence of droughts and of course as we will discuss later, the relationship of this to climate
40 change and its associated impacts on the hydrology and frequency of events within the system. So we are well aware of that kind of variability.

THE COMMISSIONER: I will come back – that variability suggests to me that in order for there to be some deliberate attention by those with government stewardship
45 of these things, the effect of drought on streams is part and parcel of their ecology. It will happen from time to time and the plants, the microorganisms, the animals and for a long time, perhaps until about 1880-1890 the humans simply dealt with it.

ASSOC PROF PITTOCK: It's Associate Professor Pittock talking. Commissioner, you are entirely right. Drought is a natural part of the Australian environment and our flora and fauna and ecosystems are partly – substantially adapted to it. The question then is, if humans are removing some water from the river for consumptive use, are we exacerbating the length and the depth of that drought?

THE COMMISSIONER: That's what I had in mind, the figure of speech is distortion.

10 ASSOC PROF PITTOCK: Indeed.

THE COMMISSIONER: There's a frequency that, for my present purposes and I'm using this fantastically, whether depending on solar flares or necromancy it doesn't matter, there was a frequency which produced Dorothea Mackellar's famous lines, but taking out very large amounts, relatively speaking, and relatively recently for consumptive use introduces a whole new factor - - -

ASSOC PROF PITTOCK: Yes.

20 THE COMMISSIONER: - - - in the quantitation of the amount of water available for the environment.

ASSOC PROF PITTOCK: Which is being exacerbated by climate change impacts.

25 THE COMMISSIONER: Yes.

ASSOC PROF PITTOCK: And so past Australian government water management practice has assumed that because Australia's biota is adapted to drought, it doesn't matter during a drought if that biota is starved of a little more water in favour of consumptive uses like irrigation farmers. But as we move into a changing climate, then that becomes problematic if the drought period exceeds the capacity for things like Red Gum trees to thrive or between the breeding periods of colonial water birds to lengthen such that they can't breed and replenish their population between droughts. So those thresholds are a critical thing for scientists to identify and convey to policy-makers to help them make more informed decisions.

THE COMMISSIONER: I don't want to be rude to what appears to be a very hard working cadre of scientists in this country, but would I be right in saying that the criticality, in particular, for the Darling and its tributaries of what I'm going to call low flows is not fully understood, to put it mildly?

ASSOC PROF PITTOCK: There are many aspects of how the rivers work for biodiversity that are poorly understood and the Darling is one of those areas that is less well studied. What is concerning is that with the climate change projections, the Darling Basin may be an area that receives more rainfall and more water run-off. And so while it has been written off as a portion of the Basin that contributes little to

downstream water flow to the mouth, in the future, with climate change projections with the potential for tropical moisture systems to come further south - - -

THE COMMISSIONER: It's tropical runoff in Queensland that will - - -

5

MR BEASLEY: You're talking about the projections that say the Northern Basin might get wetter and the Southern Basin is more likely to get drier.

ASSOC PROF PITTOCK: Precisely. So that hasn't been considered in the Basin
10 Plan formulations.

PROF THOM: Coming back to your point, Commissioner, about the nature of
variability, over many years the geomorphologists who have studied the history of
streamflow and stream channel geometry in the Murray-Darling Basin, of which
15 there have been an enormous number of studies, have recognised two things. One,
under the glacial-interglacial cycle there has been huge changes in the amount of
water that have come through the Murray-Darling Basin. I will park that to one side
for the moment. But within even historic times we have what we distinguish
between flood dominated regimes and drought dominated regimes and the rivers
20 behave differently under these different regimes. I have not seen in any of the
discussions so far with respect to the Murray-Darling Basin Plan or the Guide a
recognition of that science and what it means. And I will elaborate this further when
we get downstream to the Murray Mouth.

25 But it's the understanding of that variability that Dorothy Mackellar, words in a
physical geomorphological context which are so critical to understanding river
behaviour and as we take more water out of the system and we add the climate
change factor, we exacerbate it, as Professor Pittock says. We are just adding to the
dimension of the impacts of drought and then the question of ecological resilience
30 becomes questionable under those exacerbated circumstances. So it's that context in
which our thinking has evolved over the last five years or so because we are getting
to know more and more about not only the nature of take of – for consumptive
purposes but more and more as we get to understand the nature of the climate change
signals that are likely to occur within this Basin.

35

THE COMMISSIONER: I have in mind in particular the tension that the statute sets
up between what I'm going to call an environmentally sustainable level of take as the
statute defines it, and the maximising of social and economic benefit will result. And
the variability question interests me because in terms of the Plan, which tends, for
40 reasons that I fear may be more cultural than biological or geological, tends to be
expressed in annual matters. We have droughts in particular that span a number of
years, which become critical, for example, because the breeding cycle of birds may
be only a handful of years. And the resilience of large, established biota like Red
Gums may still be years, though one hopes a few more than birds. And yet
45 permanent crops have to be more or less permanently watered, particularly in high
summer. And annual crops, of course, if they are to be repeatedly annual, have to be
watered every year.

And that this seems to set up quite a tension in the nature of the resource from which the consumptive use is taken, can be seen to dwindle enormously by natural fluctuation as well as flood. And permanent and annual cropping is the very opposite of that, that is, it can't bear much fluctuation at all. The almond trees need that much
5 water in order to transpire or they will die. Take something really straightforward, an irrigated – a lucerne crop needs water of a particular volume at a particular time, or all the labour has gone to waste. I have in mind that these are tensions that particularly make critical the idea of the level below which, with a constant – when I
10 say constant, I don't mean fix because we know that allocations vary and can vary drastically, and they always make people very unhappy when that happens, as you would expect.

ASSOC PROF PITTOCK: Commissioner - - -

15 THE COMMISSIONER: I don't, at the moment, fully appreciate, I think, how one can reduce to relatively simplistic words the numbers like 4,400 gigalitres, the amount that needs to be recovered for the environment, when there is natural variability greatly in excess of that amount.

20 ASSOC PROF PITTOCK: Commissioner, as I see it, Professor Pittock, if I could briefly touch on a few of the crucial points you're making. The governments would argue that the water entitlements that operate as a share of the available resource in any one year naturally adjust to take account of whether it's a particularly wet year or a dry year by adjusting the entitlement of water.

25 THE COMMISSIONER: Actual allocation. Yes.

ASSOC PROF PITTOCK: The problem for sustaining the environment is, however, that under the Basin Plan, something in the order of three quarters of the water for
30 the environment is in the form of so-called rule spaced water, which is not in legally binding entitlements. In our submission on page 32, figure 9, we illustrate this challenge in relation to the Millennium Drought for the Murrumbidgee River, and what you can see here in the upper line is that the available water, the inflow has declined quite substantially in the latter years in the Millennium Drought. But
35 because of the way the state water allocation rules work in favouring entitlement based water, the water available to the irrigation use has remained fairly consistent; whereas, the bottom line, the outflow, the water available for the environment is discriminated against in terms of the entitlement share in a dry year.

40 THE COMMISSIONER: This was a figure that I had in mind when I was talking about this tension, where you've got variability – remind me, what year do we conventionally date the Millennium Drought from?

ASSOC PROF PITTOCK: It varies from place, but - - -

45 THE COMMISSIONER: Yes.

ASSOC PROF PITTOCK: - - - in around 2002 to 2010.

THE COMMISSIONER: So that there's a relatively steep decline shown in this graph just about from 2000 onwards.

5

ASSOC PROF PITTOCK: Yes, that's correct.

THE COMMISSIONER: Down to 2003.

10 MR BEASLEY: So this shows that in a dry, the risk is borne by the environment, not primary risk.

ASSOC PROF PITTOCK: That's right, and you may recall that in the Guide, there was a proposal whereby that risk would be shared fifty-fifty between the environment and water users.

15

MR BEASLEY: Yes.

ASSOC PROF PITTOCK: That policy proposal was dropped by the Authority in adopting the Basin Plan and, essentially, they said, "We will deal with that in the next revision of the Basin Plan."

20

THE COMMISSIONER: Now, fifty-fifty strikes me as even more alarmingly neat, that is, unconvincing.

25

ASSOC PROF PITTOCK: Indeed.

THE COMMISSIONER: But if you went with two-thirds as a rule of hydrological thumb, why wouldn't the sharing be two-thirds to the environment and one-third to farming?

30

ASSOC PROF PITTOCK: It's a good question. As a scientist in this area, I would actually prefer that there was sufficient knowledge about thresholds to sustain key environmental assets you wanted to protect, for example - - -

35

THE COMMISSIONER: How very old fashioned of you.

ASSOC PROF PITTOCK: Indeed.

40 THE COMMISSIONER: You want some facts.

ASSOC PROF PITTOCK: Yes.

THE COMMISSIONER: Yes. So you won't be surprised to know that I'm not a scientist, but, as a lawyer, I'm interested in what the Act requires; that is the Act made pursuant to intergovernmental cooperation, including South Australia, and the Act requires that there be an environmentally sustainable level of take.

45

ASSOC PROF PITTOCK: Indeed.

THE COMMISSIONER: Which does indeed require facts of the kind that you've just referred to, which would mean all rules of thumb are, no doubt, useful, but only
5 as rules of thumb and couldn't possibly be the last word.

ASSOC PROF PITTOCK: Quite.

THE COMMISSIONER: Which rather suggests, doesn't it, that the search is on for
10 a method by which, holistically and in analysed detail, that is, you have got to look at the whole – the parts that make up the whole, there needs to be the setting of what has become known as environmental watering requirements, which is a bit of a ponderous phrase, but it actually conveys its meaning, I think. For the environment to be appropriately watered, certain things are needed according to a scientific view,
15 which will no doubt change from time to time, I hope. And once you set that, you will have volumes, timings, methods, locations integrally related because you miss any of those, and you won't be considering environmental watering, not in a variable, seasonal system; is that right?

DR STEINFELD: It's Dr Steinfeld here. Yes, that is correct and there is some
20 scope within the current Basin Plan framework to be able to account for that variability. When the ESLT team report was developed in – well, it was written in 2011, there was 122 flow indicators that were identified that did encapsulate the low, the medium, the pressures and then the overbank flows. So there was scope to allow
25 for variability and identify thresholds for the thresholds of concern where a particular indicator was or was not met.

MR BEASLEY: Different volumes of flow at different percentages in terms of
30 number of years, that sort of thing.

DR STEINFELD: That sort of thing, correct.

MR BEASLEY: Yes.

DR STEINFELD: The graph that we have shown, figure 9 in our submission, is – is
35 showing that the flows that we're expecting aren't arriving during the dry periods. So the targets that are established for dry times, as well as the wet times, they were long-term targets, but during the dry times, the flows that we're expecting are not necessarily reaching the locations, and there's a couple of reasons for why those
40 flows are not reaching those locations. As Jamie mentioned, planned environmental water has different rules and requirements associated with it compared to held environmental water, which is entitlement-based, and there's different priorities associated with what is allocated to which priority during a drought. So it's important to look at the water resource plans in the different valleys to understand
45 when there's limited water available, what gets that water first.

In 2004, the Macquarie Cudgegong water sharing plan was switched off because, or was suspended, because there wasn't enough water to fulfil the requirements of the water sharing plan. So it meant that there was decisions at the time that affected the prioritisation. So during a dry time, there wasn't enough water to be given to the
5 planned environmental water and, as a result, there was less water available to the environment during the dry periods. What needs to happen is more formalisation of priorities during dry times, recognising that planned environment water makes a very substantial component of the overall environmental water.

10 The second area of importance which you have, no doubt, been involved and interested in is the Murray-Darling River system where the flows – the flows that have been – expected to come down during the low flow periods are not actually arriving at the target locations, and that's as a result of the changes in the water sharing plan that allow pumping of licences at low flow, you know, in the
15 window of less than 500 megalitres at Bourke. And it's very, very important that the protection of environmental flow is maintained to ensure that those critical environmental thresholds don't get broken during a drought, and the opportunity does exist and the Murray-Darling Authority has confirmed the importance of the protection of low flows and measures to ensure that that passage of water gets
20 through all the way down to Wilcannia during a drought.

MR BEASLEY: It's pointless otherwise, isn't it, if there's a flow from a – environmental flow from a water storage or a dam and it's then able to be pumped, it's ceased to be an environmental flow and becomes water available for
25 consumptive use.

DR STEINFELD: Yes. And it's critical - - -

MR BEASLEY: So it changes its character simply because it's moved into a
30 different area where there's a water sharing plan that has different rules.

DR STEINFELD: Yes, and coming back to that high level setting of the ESLTs, the long term averages, it matters a lot whether that water is taken out during a wet period or a dry period and, as Bruce mentioned, you know, the flood dominated
35 regimes and the drought dominated regimes, taking water out at those particular times will have a very significant impact on the ecological outcomes.

THE COMMISSIONER: The amounts I see as simple figures – whether it's 3,800, 4,000, it doesn't matter at the moment – they are overtly on the basis of a so-called
40 long-term averaging; is that correct?

ASSOC PROF PITTOCK: Yes.

THE COMMISSIONER: So that means in any particular season, they will be, as it
45 were, factored down for reality and, perhaps unusually, achievable 100 per cent; is that right?

ASSOC PROF PITTOCK: Associate Professor Pittock. Yes, those are based on long-term average annual yield calculations, and you're entirely correct to point to them and to say that that's not the full story. That's one of the reasons why the Wentworth Group, we've been particularly concerned about the constraints
5 relaxation projects because it's only by enabling pulses of water, managed pulses of water to travel down the river of sufficient volume to get out of the river channel and onto the floodplains, will it be possible to meet the, sort of, frequency requirements you're talking about for inundation to sustain some of these key ecological assets.

10 THE COMMISSIONER: The constraints relaxation program sounds like a bit of yoga, doesn't it?

ASSOC PROF PITTOCK: Always.

15 THE COMMISSIONER: What's the relaxation? It's easing a constraint; is that right?

ASSOC PROF PITTOCK: So the current argument that the governments are making is that if they send a managed pulse of water, an environmental flow down a
20 river, what emerges out of the riverbanks and inundates private property, damages infrastructure, be it haysheds or bridges or what have you, that that is unacceptable.

THE COMMISSIONER: Yes.

25 MR BEASLEY: That has been built on floodplains.

ASSOC PROF PITTOCK: That has been built on floodplains.

MR BEASLEY: Yes.

30 ASSOC PROF PITTOCK: And so the constraints relaxation is horrible jargon for, essentially, giving room to the river to flood naturally.

THE COMMISSIONER: So it mostly involves subsidising private owners to adjust
35 either physically or logistically or, in terms of management, to artificially create or artificially increased bank-breaking events; is that right?

ASSOC PROF PITTOCK: Yes, there's three standard investments: one is paying
40 people to move infrastructure out of harm's way.

THE COMMISSIONER: I'm sorry to be pedantic, but I've come to resist the notion that breaking the banks is harm.

ASSOC PROF PITTOCK: Indeed, you're correct. I have misspoken. Moving
45 infrastructure such that it would not be inundated in a natural event.

THE COMMISSIONER: Against water damage, yes. Yes.

ASSOC PROF PITTOCK: The second would be compensating landholders for the partial loss of value of their land if they had aspirations and the legal right, for example, to crop land.

5 THE COMMISSIONER: This is the so-called easements model.

ASSOC PROF PITTOCK: Easements, yes, indeed.

10 THE COMMISSIONER: Now, this is what pedants like myself as property lawyers would call an easement in gross; that is, it's a technical term describing something which the public at large takes to burden a private owner's land, and they're a marvellous idea, insofar as, socially, they recognise that the individual private owner should not individually bear the burden of something that is for the benefit of the public at large. We don't tend to use the expression easement in gross as widely as it
15 might be, but the whole notion at Commonwealth level of constitutional just terms for acquisitions of property and, at state level, the legislated – uniformly legislated compensation for compulsory acquisitions reflects that notion. Why are the private uses, including improvements of floodplains, seen as constraints, rather than simply as risks that floodplain owners inherently take?

20

ASSOC PROF PITTOCK: Yes, that's a very good legal question that I'm not sure I'm qualified to answer.

25

THE COMMISSIONER: actually meant it as a social policy question.

30

MR BEASLEY: It might be because if you put an environmental flow on the back of a natural flow from a rain event, you are – it's the water holder that is creating the additional water and, therefore, someone might suggest that we need to be compensated by the water holder.

35

THE COMMISSIONER: Well, the common law - - -

40

ASSOC PROF PITTOCK: I would - - -

45

THE COMMISSIONER: Of nuisance – just to talk about something, again, I know something about. The common law of nuisance has, as a generalised proposition, the liability as a wrong for one of unreasonably altering the natural flow of water to another owner. A classic example is when you take the run-off from your paddock and pipe it so that it's concentrated and causes erosion in your neighbour's downhill paddock. That's the classic example. Another classic example is if you build a small levee which prevents the natural flow of water onto your neighbour's land, and these things are inefficiently fought out by people foolhardy enough to afford people like me in private court cases, which is not a good idea, obviously. So they're mostly now regulated by different means. But I'm seriously – I'm constantly coming across constraints as – to coin a phrase, a constraint on environmental watering, and I'm increasingly wondering how one can seriously talk about environmentally

sustainable limits of take or sustainable diversion limits or the recovery and – what’s the other word – recovery and - - -

MR BEASLEY: Restoration?

5

THE COMMISSIONER: No, in the statute. The obligation is – protect. The protection and recovery of the biodiversity dependent on the rivers. If, from time to time, you can’t permit nature, that is, no sand bagging, and from, time to time, boost nature, that is, make up for consumptive depletion because that’s what happens when there’s a controlled release in the fully regulated Murray, in particular, you’re not emulating nature at all. You are making up for the depletion in the natural effect brought about by (a) conservation of reservoirs and (b) consumptive use. So it’s highly unnatural to be talking about a natural state of affairs in that system now, but I’m really puzzled and would be very grateful for all of your assistance on how I should frame, conceptually, this notion of these - - -

10
15

PROF THOM: Can I - - -

THE COMMISSIONER: - - - constraints preventing floodplain from being flooded.

20

PROF THOM: Professor Thom. Can I offer a phrase to use here?

THE COMMISSIONER: Please.

25

PROF THOM: What I would call the floodplain paradox.

THE COMMISSIONER: Yes.

PROF THOM: So on the one hand, you’ve got, as you’ve heard, this question of things being in harm’s way or things to be – structures to be protected or crops to be protected, but a floodplain, by definition, is for floods.

30

THE COMMISSIONER: Yes.

PROF THOM: And the advantage of floodplains being flooded is that it brings not just water, but it brings soil and nutrients and it refreshes the health of the floodplain. That - - -

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THE COMMISSIONER: When I was a boy, floodplain flats and paddocks were the most prized part of the kind of property you might dream of buying.

40

PROF THOM: Now, if you look – go back in history, the Egyptians understood this, and they wanted the flooding of the Nile delta.

45

THE COMMISSIONER: Yes, but then they built land, so - - -

PROF THOM: But they changed later on, but they managed to get some regulation going, but they understood the power of having the water and the nutrients flooding their lands.

5 THE COMMISSIONER: Yes.

PROF THOM: In the Mississippi, they built the big levees along the river and that led to the degradation of the soils of the floodplains by keeping away the flood. So there's a paradox here in terms of the people who own those floodplain flats benefit
10 from them, from those floods, but at the same time, they don't want them. So - - -

THE COMMISSIONER: Another even more bleak assessment of the social attitude is that they're content to mine, during their lifetimes, the soil of related consequences of prior floods, but they wish to prevent floods while they're alive.
15

PROF THOM: That brings us into the intergenerational issues that I'm sure we will touch on further.

THE COMMISSIONER: Which the statute also requires me to give consideration to in terms - - -
20

PROF THOM: Yes. Correct.

THE COMMISSIONER: - - - of the likely success of the Plan in achieving the outcomes required by the Act - - -
25

PROF THOM: Exactly.

THE COMMISSIONER: --- which is at the heart of my Terms of Reference.
30

PROF THOM: And also in the Act, I'm looking at section 21(3), Basin Plan to Implement International Agreement. 21(3) makes reference subsection (b):

35 *To promote the conservation of declared Ramsar wetlands in the Murray-Darling Basin.*

Now, these Ramsar wetlands also require a flooding regime.

40 THE COMMISSIONER: I suppose that's why they're called wetlands, is it?

PROF THOM: Yes, and these particular flooding regimes, of course, are progressively being interfered with by more and more extraction of the waters and, particularly, now with climate change coming in, the wetlands, the tipping points
45 associated with the ecology, as Professor Pittock's pointed out, becomes critical to understand, and I think we would contend that we do not fully understand what those

tipping points are for some of those wetlands. We have already had one adjustment to the – under section 3(2) of the Ramsar with respect to the information supplied with the Ramsar in the Lower Lakes. So we're conscious that these water flows are critical in relationship to these different types of wetlands, but we're not sure about
5 what the tipping points are for the destruction, and that's something, I think, is vital to a successful implementation of a Basin Plan.

THE COMMISSIONER: Well, then, that brings me to environmentally sustainable development principles because that has within it what many of us are used to calling
10 the precautionary principle, which is triggered by an absence – an appreciated absence of knowledge. That is uncertainty about things such as trigger points.

MR COSIER: To which the Guide deals with extensively, Commissioner.

15 THE COMMISSIONER: Yes, and the statute, of course, builds that, that is compulsory, as a matter of law. And so, again, my Terms of Reference require me to consider whether the Basin Plan is likely to achieve the outcomes required by the Act. The outcomes required by the Act involve what is, verbally, a bias, not in a derogatory sense, but in a pre-set directional sense. A bias in terms of prudence
20 which would mean more water, not less water for the environment, in the event of insufficient knowledge to know whether you're causing it harm by not recovering more water for the environment.

MR BEASLEY: Whether you're compromising.
25

THE COMMISSIONER: Yes, and at the moment, at least, and again at any time, not just in response to this next comment, I would be fascinated by the contributions of any of you on this. At the moment, at least, it does seem to me that the plan in its current duration, including the latest changes, doesn't seem to be informed by the
30 precautionary principle aspect of ESD at all and, indeed, actually seems to be to the contrary; namely, that in a milieu of doubt, reduction becomes possible, whereas I think the statute means a in a milieu of doubt, reduction is impossible.

MR COSIER: Commissioner, two comments: one directed to that one and then I
35 will come back to your dilemma over concept of constraints.

THE COMMISSIONER: Thank you.

MR COSIER: In 2011, we were strongly arguing that the draft Basin Plan should be
40 withdrawn from public exhibition. It failed to deal with just about everything you had just raised. In fact, we wrote to the Prime Minister in December 2011 and, with this view, that as it stands, we believe that Parliament should reject this Plan because unless scientific – unless current scientific consensus is completely wrong, it has no chance of creating a healthy working Murray-Darling Basin for the reasons you were
45 saying, and we could go into the history of that, if you like.

MR BEASLEY: I'm going to take you through the Wentworth Group - - -

MR COSIER: I - - -

MR BEASLEY: - - - publication called 'Statement on the 2011 Draft Murray-Darling Basin Plan' which was published in January 2011.

5

MR COSIER: Yes. Okay. Happy to do that.

MR BEASLEY: In which you – the group contends the Plan should be rejected for a range of reasons.

10

MR COSIER: Your question on constraints, putting my former town planning hat on, and the whole idea of easements, etcetera, of course, easements are created in this country every day for the public good. You couldn't build a road or a railway line or a power line or anything in this nation if there wasn't the ability to provide easements, and as you rightly pointed out, through the Commonwealth law, you have compensatable powers, and through state statute, you have statutory compensation powers to achieve that. So why is there this massive disconnect between a healthy river and a healthy road system or a healthy telecommunications system, and I think a lot of it is part of the evolution of our understanding of how our continent works and what is for people and what is for the environment? Right. So the core question is who actually owns the rivers? So the contestability about that. When we talk about environmental flows, one of the great downsides of that is that there's an assumption that it's just for ducks and water birds and fish when, in fact, environmental flows are providing public good benefits to downstream users.

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THE COMMISSIONER: Again, I mean this seriously. I really dissent from the idea that you can just dismiss things as just ducks, water birds, etcetera.

30

MR COSIER: But that's – that's – but this is - - -

THE COMMISSIONER: And the Parliament of Australia says we can't do that.

MR COSIER: Correct, which is why we were so supportive - - -

35

MR BEASLEY: Stop looking at the Act.

MR COSIER: - - - of the Water Act. There's – was coming back to your first question - - -

40

THE COMMISSIONER: What I mean is this is not – I would strenuously refute that there is some fringe or ratbag overly green approach unless one is prepared to apply those epithets to the Commonwealth of Australia.

45

MR COSIER: So our point is you cannot provide the benefits to people of a healthy river if you don't address things like the volumes of flows, the quality of water, the ability of moving water down river systems.

THE COMMISSIONER: Yes.

MR COSIER: It's not only for ducks and water birds. It's fundamental to providing all the other benefits that people derive from river system, and there is still, in this
5 country, a contestability about, "Well, hang on, we own the rivers." Right. There are some irrigators out there who believe that the rivers in the Murray-Darling Basin are theirs to use as they choose. That has been the historic precedent we've had in this country.

10 THE COMMISSIONER: That wasn't the common law – to a degree, if that was the common law of riparian rights - - -

MR COSIER: Correct.

15 THE COMMISSIONER: - - - in a very wet little country of the top left-hand corner of Europe.

MR COSIER: Yes, and as we – correct. And, yes, if you went back and 'recolonised Australia', you'd probably create property rights for water, not land,
20 because water was always the scarce resource; whereas in Europe, land was the scarce resource and water was abundant, but that's getting very deeply philosophical. But back to the fundamental point, this contestability about who owns the rivers is still playing through the Australian politics and it underpins a lot of the water initiative, and a lot of the principles and philosophies that underpin the Water Act.
25 So the question you're asking are questions that were only just asked as part of this National Water Initiative Water Act construction process. So one example: I remember clearly we were over the moon with excitement that the National Water Initiative recognised that ground water is connected to river water. Fundamental ecological concept that ground water systems move through sand and end up in the
30 river.

Until then, that hadn't ever been put into any form of government document. In 1998, the then deputy Prime Minister Tim Fisher went to the 1998 election with a
35 promise to zap the cap. So it was only in 1997 that Australia decided to cap the issuing of entitlements in the Murray-Darling Basin system. So 1998, we had the deputy Prime Minister saying zap the cap. And in 2010, we're saying Australia should be the first nation on earth to actually put water back in the river. So this is a huge cultural shift that has taken place between those two periods which is, again, why we were so supportive of the Water Act for all of its flaws and so supportive of
40 the National Water Initiative for all of its flaws because it moved Australia quantum in its understanding about how Australians' highly variably ecosystems work and what we do to maintain those ecosystems in healthy conditions.

MR BEASLEY: Thank you. Just before we break for morning tea, I'm not sure we
45 got an answer to – or any of your views on the question that the Commissioner put, which was in the context of the legislation requiring the Basin Authority to exercise its functions, bearing in mind environmentally sustainable development including the

precautionary principle, that that seems – the proposition the Commissioner put was that that seems to either be ignored or even inverted in relation to the recent SDL adjustment for increasing the SDL by 605 gigs on the back of measures that (a) have not been implemented yet, (b) don't have to be for many years, (c) may not achieve what is hoped to be achieved from them and (d), at least, in relation, as an example, Menindee Lakes carry known environmental risks. That doesn't seem to be exercising a function consistent with environmentally sustainable development. Do any of you have a comment in relation to that?

10 THE COMMISSIONER: Could I just add to that plum pudding that Mr Beasley has given you, one further sultana, and that is Mr Phillip Glyde's reported comment that we all should be patient to await the environmental outcomes of various expedients that are either in train or are proposed, which I translate as meaning he doesn't know and none of us will know for quite some years as to whether they will work or not to recover and protect the relevant biodiversity. If you add that to what Mr Beasley has said, I must say it sounds a very bad thing.

MR COSIER: Peter Cosier here. To add to that point from Dr Glyde, as it stands, that, as a general rule, is his opinion and the Authority's opinion because most of the information that is available to the community from which they base their opinion is not available to the community. So we have to take on trust that the Authority's opinion is the right opinion because most of the information that is provided is never put in the public domain to allow for public scrutiny.

25 THE COMMISSIONER: I can go further and more pointedly say that the statements to which I'm referring are statements which don't involve any of us being asked to trust them but, rather, are statements that's saying they don't know either, and they were engaged in that experiment. But it's an experiment, as Mr Beasley's pointed out, that starts with the reduction which would be justified by the results that haven't yet been obtained which I think is illegal. That's – interested in people arguing to the contrary, so that in a usual lawyer-like way, I can take that all into account. Interim issues paper number 2 records my views in relation to that.

35 If I have characterised correctly what the MDBA, by its Chief Executive, seems to be publicising, then ESD seems to have gone out the window, and we are experimenting, not in a usual western empirical way, but in a bastardisation of that which says, "I will now act administratively to reduce by something in the vicinity of 600 GL recovery for the environment because that would be justified by results I have not yet obtained from environmental watering expedience, measures, as they're called, that have not yet been undertaken, all with what's called a high level of uncertainty." Now, I really need your help. Have I missed a point when I pull all of that together and say there is something terribly wrong here, that is, to me as a lawyer, contrary to the statute and I gather from what I've read, and I have read what you have given us, you don't think it has any scientific basis?

45 ASSOC PROF PITTOCK: Associate Professor Pittock. Commissioner, we would agree with your analysis and that of the special counsel that the precautionary

principle is not being observed in practice here. Certainly, it greatly concerns us that from our participation of the process over the years, from the evidence that Dr Colloff gave to you earlier, that a number of the key indicators, the 112 indicators appear not to be met; that where they are claimed to be being met, that the high level of uncertainty risk category has been chosen by the Authority as appropriate.

THE COMMISSIONER: What does that mean?

ASSOC PROF PITTOCK: In science - - -

THE COMMISSIONER: A high level of uncertainty, to me as a lawyer, sounds like probably not.

ASSOC PROF PITTOCK: In science, this is a, sort of, modified Likert Scale which is an academic practice that when you have got a qualitative or very complex situation, it's an expert judgment that's expressed in, you know, one of three or five categories. So, for example, the intergovernmental panel on climate change use this approach to convey the strength of expert opinion around any one issue to policy makers, and that is the approach that the Authority has taken here. So it has a basis in practice in science as a way of expressing expert opinion on a qualitative matter.

THE COMMISSIONER: So what does it mean to say that a threshold can be achieved with a high level of uncertainty? I've tried to understand what that means in English. Does it mean, "I think it probably will be achieved, but I suffer major doubt about that", which seems to be a sentence which consumes itself.

ASSOC PROF PITTOCK: Yes.

THE COMMISSIONER: Or does it mean, "I don't think it will probably be achieved because the prospect of it being achieved is accompanied by a high level of uncertainty", which means it's not probable. It's possible, but not probable.

ASSOC PROF PITTOCK: So with – yes.

THE COMMISSIONER: I don't know how to choose between those, and I have to say I think it is deplorable English, and one of my recommendations may well be that the MDBA write in English.

ASSOC PROF PITTOCK: Indeed. Indeed. So, certainly, our interpretation is that there's a high risk that that indicator will not be met with the volumes of - - -

THE COMMISSIONER: Does that mean "most likely will not be"?

ASSOC PROF PITTOCK: The – with a number of the scientific questions, when things like hydrological models are run, there are a spectrum of possible outcomes. There's no one magic number that the computer spits out at the end. And so a common practice in many of these sorts of issues now in science is to do a so-called

Monte Carlo simulation where you run lots and lots of model lots and lots of times
- - -

THE COMMISSIONER: Yes.

5

ASSOC PROF PITTOCK: - - - and end up with a spread of possible results, and then a wise manager would choose the second worst and the second best and the median and start to debate, well, what does that mean for management.

10 THE COMMISSIONER: Quite. Now, lawyers are not strangers to this because we live in probabilities and also, for some questions, possibilities. There are issues that, in a court, is decided by saying, “Well, I don’t – perhaps I don’t think it’s likely that something will happen, but it’s possible and I will assess its prospect at, say, 10 per cent”, and you get damages - - -

15

ASSOC PROF PITTOCK: Yes.

THE COMMISSIONER: - - - based upon a 10 per cent assessment of the possibility of a favourable outcome, and I stress there’s nothing paradoxical about that. The court has simultaneously done two things. It says this is a possibility. I find, if you will forgive the language, more likely than not, there is a possibility. That’s what they could call a probable possibility. But we then say that the size of that possibility – which having found probable, I now treat as a fact, the size of that possibility for some issues only, in damages mostly – we call them losses of chance in cases – can be less than 50 per cent and you still get damages.

20
25

And so if you were hopeful of achieving a million dollar outcome, but the judge assesses you only have a 10 per cent chance of achieving it, you will get 10 per cent of the million dollars only. But what you can’t escape when you’ve gone through that exercise – whether it strikes people as paradoxical or otherwise, what you can’t escape is that there’s been a solemn inquiry which has concluded most likely, more likely than not, it will not happen – you won’t get anything which is why you’re not going to get a million dollars. Isn’t that – is that what they mean when they say something can be achieved with a high level of uncertainty; namely, it’s possible, that’s the “can”, but the high level of uncertainty is it’s not probable, it is merely possible?

30
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DR STEINFELD: Commissioner, can I draw your attention to the ESLT report where the Murray-Darling Basin Authority defined what they meant by the low uncertainty frequency and a high uncertainty frequency.

40

THE COMMISSIONER: Yes.

DR STEINFELD: The definition of the low - - -

45

THE COMMISSIONER: Where will I find this?

MR BEASLEY: So it's exhibit - - -

THE COMMISSIONER: Is it RC6?

5 MR BEASLEY: It is exhibit RC6.

THE COMMISSIONER: What page should I go to?

ASSOC PROF PITTOCK: 43.

10

DR STEINFELD: No, it's not - - -

ASSOC PROF PITTOCK: No.

15 DR STEINFELD: It's page – yes, it's page 46.

THE COMMISSIONER: I think this is the passage I've got a double of – I've written – drawn a double red line and an arrow on it, probably. You tell me what passage.

20

DR STEINFELD: So the Authority says that for the low uncertainty frequency, there is a high likelihood that the - - -

THE COMMISSIONER: Yes, we're at the same passage.

25

DR STEINFELD: Yes:

30 *... environmental objectives and targets will be achieved, and the high uncertainty frequency is considered to represent boundary beyond which there is a high likelihood that the objectives and targets will not be achieved.*

THE COMMISSIONER: I was aware of that. It has informed my comments to you for your reaction. That sounds to me as this – I can't read the expression:

35 *... beyond which there is a high likelihood that the objectives and targets will not be achieved.*

I cannot read that as meaning anything other than that, at that level, that is, not beyond, but at that level, more likely than not, it will not be achieved.

40

MR BEASLEY: I'd say it's even stronger than that.

45 THE COMMISSIONER: But lawyers have a simplistic zero to 100 for this or we have an image of tipping the scales, and the scales or the zero to 100 can just shift the midpoint or they get jammed up one end, and it just seems to me this is language that makes it clear to demonstration – unless somebody from the MDBA cares to interpret their idiosyncratic English differently.

MR BEASLEY: You've picked up the phrase:

... can be achieved at a high level of uncertainty –

5 as otherwise meaning - - -

THE COMMISSIONER: Yes, I think it's offensive English. I think it's an attempt to bureaucratically obfuscate the intellectual process that has been gone through. To say that something can be achieved and then add, without even the courtesy of a
10 comma or a parenthesis, "with a high degree of uncertainty" must be hoping that the rapid reader will simply see "can be achieved and high degree of uncertainty" as scientific caution. Whereas, I think that when one looks at everything, their statement of their own method, though it's not anywhere in a headline, what they are actually saying is, "We don't think it will be achieved." And I don't understand how
15 an administrator with a statutory discretion bound by ESD and the other matters to which attention has been drawn, I don't understand how one can conclude that you don't think something will be achieved and yet make decisions as if it will be, or worse, as if it has been.

20 MR COSIER: Well, Commissioner - - -

THE COMMISSIONER: I'm really puzzled by that as an approach. I find it alarming as an administrative lawyer. I just – and I'm very interested to know what
25 your scientific and public policy responses are to that.

MR COSIER: Well, Commissioner, it went further. So if you take that point with regard to the Guide, the Guide is saying 3,800 and - - -

30 MR BEASLEY: Yes.

MR COSIER: - - - whatever is unlikely to achieve the objectives of the plan.

MR BEASLEY: 6,900 in round terms is - - -

35 MR COSIER: Yes, or 7,000. So 3,800 and whatever, 3,800 was unlikely.

THE COMMISSIONER: Yes.

40 MR COSIER: In fact, to quote the words exactly:

... represents a boundary beyond which there is a highly likelihood that the objective and targets will not be achieved.

45 THE COMMISSIONER: Now, this – I really deprecate the use of this - - -

MR COSIER: But then we go - - -

THE COMMISSIONER: - - - language, but what – this “boundary beyond which”
- - -

MR COSIER: Yes.

5

THE COMMISSIONER: - - - that means “at that point”.

MR COSIER: Yes.

10 THE COMMISSIONER: “At that point” - - -

MR COSIER: A point of no return.

THE COMMISSIONER: - - - - - “you don’t think it will happen.”

15

MR BEASLEY: In case the witness is concerned - - -

THE COMMISSIONER: That is more likely than not, it won’t happen. It might.

20 MR BEASLEY: I’m going to be going to that range and then 2,750.

MR COSIER: No, it’s – but I just make the observation - - -

MR BEASLEY: Yes.

25

MR COSIER: - - - it then went to 2,800 which is another 1,000 below that range.

THE COMMISSIONER: We are aware of all that evolution.

30 MR BEASLEY: Yes.

MR COSIER: And it then went below that by adding ground water as an offset to
the return of river water - - -

35 MR BEASLEY: Yes.

MR COSIER: - - - which had the potential the draft plan to increase river water
returns of 2,800 GL and reduce ground water – increase ground water extraction by
2,200 GL, so the end result of the Basin Plan could have been taxpayers spending
40 \$10 billion and ending up with about 400 GL of water.

THE COMMISSIONER: Yes.

45 MR BEASLEY: Just three things before we break. Senior counsel, not special
counsel.

THE COMMISSIONER: Are you - - -

MR BEASLEY: No apology - - -

THE COMMISSIONER: - - - special, but

5 MR BEASLEY: - - - is needed, but there's just that some law firms call some of
their lawyers special counsel, and some of them I've met, there's nothing special
about them. Some, there absolutely is, but if I get special counsel again, I'm going to
have to move to Victoria, forget my republican leanings and become a QC.
10 Secondly, I'm going to inquire over the lunch break why my microphone's on an
empty box of wineglasses, and maybe this is a message being sent to me or all
members of the New South Wales Bar and, thirdly, I have to tell the witness and
apologise in advance, that it's an offence punishable by 10 years jail if we were to
bring into this building a take away coffee. So we will have to make do with a cup
of instant or a tea for you. How long do we break for?

15

THE COMMISSIONER: Or people can leave the premises.

MR BEASLEY: People can leave the premises; yes, that's true.

20 THE COMMISSIONER: Yes.

MR BEASLEY: Thanks for pointing that out. Five past or 15 minutes or 20
minutes?

25 THE COMMISSIONER: Make it 20 minutes.

MR BEASLEY: All right. Five past 12. Thanks.

30 THE COMMISSIONER: And you are welcome to leave the premises because we
can't offer you coffee.

ADJOURNED

[11.46 am]

35

RESUMED

[12.05 pm]

40 MR BEASLEY: Can I ask in relation to that last topic that the Commissioner was
asking you about in relation to environmentally sustainable development – the
precautionary principle – did any of you have anything you wanted to add that you
thought about over the morning tea break?

45 DR STEINFELD: Yes, Dr Celine Steinfeld. I just wanted to add something brief,
that there is an overwhelming amount of scientific literature that says that rivers are
dependent on water and I haven't read anything that says that, you know, you can
take a lot of water out and there will be still benefit. In that context it's still possible

to pursue other alternatives that might give benefits such as the sustainable diversion limits supply measures but that needs to be done in a way that is extremely careful and considers the precautionary principle. And in the policy context, there should be no money given until the outcomes can be delivered. And so it's very important that
5 there's a mechanism to allow that uncertainty to be taken into account if projects don't deliver the outcomes that we expect, that the money is not provided to the states.

ASSOC PROF PITTOCK: Associate Professor Pittock. If I might follow up the
10 Commissioner's invitation to comment to Mr Glyde's assertion that the Basin Plan would take a long time to bring about ecological sustainability. The Authority has been a bit schizophrenic in its public statements on this matter. You may recall that in May they issued a media release highlighting the Living Murray wetland areas – icon sites and indicating how well they had recovered. And it's certainly true that on
15 that very small area of wetlands only around 36,000 hectares of the 5.7 million hectares of wetlands in the Basin where water has been appropriately applied, there has been a very, very rapid recovery.

MR BEASLEY: This report just happened to come out just before the Senate dealt
20 with the supply measures adjustment. Don't let me interrupt your thought processes but that report on the icon sites, many of the results there have, tell me if I'm wrong, they don't necessarily have anything to do with the Basin Plan.

ASSOC PROF PITTOCK: No.
25

MR BEASLEY: For example, regulators and other infrastructure that have had some ecological benefits were put in prior to the Basin Plan as part of, as you said, the Living Murray initiative as one example.

ASSOC PROF PITTOCK: So the point I was going to make with that is that the
30 Basin Plan can achieve very rapid ecological benefit if real water is added to wetlands at the right place and the right time. And given that the Authority says that over 2,000 gegalitres of water has been recovered for the environment, we would expect to see some sort of concomitant enhancement of the area of the wetlands
35 ecosystem in the Basin that that is intended to sustain.

MR BEASLEY: In other areas other than the icon sites.

ASSOC PROF PITTOCK: In other areas, that's right. So, as I mentioned, there are
40 - - -

MR BEASLEY: There's a risk, isn't there, of using infrastructure like a regulator, say one at Chowilla or the Hattah Lakes or wherever as a substitute for an actual flow that benefits the entire system.
45

ASSOC PROF PITTOCK: Indeed. And, in fact, I've published peer-reviewed academic work on this. One of the first systematic critiques of the so-called

environmental works and measures approach and it's flawed in a number of respects. In the Wentworth Group we are particularly concerned that a number of the sustainable diversion adjustment projects proposed in states like Victoria are being proposed as a substitute for restoring some of the larger-scale flow processes that would maintain a much larger area of wetlands.

5
10
MR BEASLEY: Just to interrupt you. Are you talking about a paper you prepared with two other authors called 'Beguiling and Risky: Environmental Works and Measures for Wetland Conservation Under a Changing Climate'.

ASSOC PROF PITTOCK: Indeed. We know the Commissioner's preference for snappy titles so 'Beguiling and Risky' is the title of that paper.

15
MR BEASLEY: You could get a job at Australia Institute, I think. Sorry, I interrupted you. That's the paper you were referring to?

ASSOC PROF PITTOCK: Yes. So there are a great many risks in relying on infrastructure to sustain these environmental assets. One is that they're very expensive and so there's an opportunity cost in terms of spending that water doing things like acquiring more water for the environment or, indeed, acquiring privately held wetlands for conservation management. Another is that the works and measures are often directly environmentally damaging. Of greater concern to myself - - -

25
MR BEASLEY: You mean building the infrastructure has an environmental cost?

ASSOC PROF PITTOCK: Yes. So we are talking about something like for example 62 kilometres of levee banks in the Koondrook-Perricoota Forest. So very substantial infrastructure that can damage ecological and Indigenous sites. That infrastructure is expensive to maintain. You put infrastructure on a floodplain. It gets flooded, damaged. There's a question about whether the governments have in place agreements on who owns and maintains that infrastructure. And at this point in time, those agreements are not in place for the SDL projects between the Commonwealth and State governments.

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MR BEASLEY: Whereas – to interrupt you again and I'm sorry for doing that – obviously a buyback doesn't have an ongoing cost, it's a one-off cost for recovery of water.

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ASSOC PROF PITTOCK: That's correct. The buyback of water means that that water is then managed through the Commonwealth Environmental Water Office and there are no substantial additional costs. The key concern I have as an environmental scientist relating to environmental works and measures is that there may be some negative impacts of those works projects. They can do things like exacerbate salinity by ponding water on the floodplains so it then seeps through the ground and exacerbates salinity or by causing so-called black-water events where bacteria on the leaf litter sucks all the water out of the – the water and that that slug - - -

MR BEASLEY: Sorry, the oxygen out of the water.

ASSOC PROF PITTOCK: Oxygen out of the water. Thank you. And that slug of water then depletes life downstream. But I note that one of the key principles of both
5 the Ramsar Convention on Wetlands and the Convention on Biological Diversity is the conservation of representative areas of ecosystems. The environmental works and measures type projects - - -

MR BEASLEY: It's wetlands generally, isn't it? It's not just those listed as
10 internationally significant.

ASSOC PROF PITTOCK: Yes. There's a misconception about the Ramsar Convention, that it's only about Ramsar listed sites, the so-called jewels in the crown. In fact contracting parties to the Convention are obliged to manage all of
15 their wetlands wisely, which in the context of the Murray-Darling Basin means the whole 5.7 million hectares of wetlands or about five per cent of the land area.

MR BEASLEY: Presumably because the birds can't necessarily identify what has been listed as a Ramsar site and what hasn't.
20

ASSOC PROF PITTOCK: Yes, the birds aren't great readers of cadastral maps and so they do like to go where the water lies. So the key point is that these environmental works and measures enable watering of the sites that are easiest to apply water to, the lower-lying floodplain areas and they discriminate against those
25 floodplain ecosystems that are higher up the floodplain and harder to get water to. And so as an example with the Victorian Government's proposed Nyah and also their Vinifera sustainable diversion limit adjustment projects - - -

MR BEASLEY: Those acronyms – you might actually have to tell us what - - -
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MR BEASLEY: In fact they are not acronyms.

THE COMMISSIONER: N-i-a-h.

ASSOC PROF PITTOCK: Let me get you the correct spelling.
35

MR BEASLEY: I've dealt with so many acronyms in this process so far that I think everything is an acronym. Go on.

ASSOC PROF PITTOCK: N-y-a-h for Nyah and Vinifera is V-i-n-i-f-e-r-a. And so in those cases, for example, the works and measures for Nyah, a 913 hectare site, would only enable regular inundation of 500 hectares. But only six per cent of the Black Box ecosystem in that area compared to 76 per cent of the Red Gum area.
40

THE COMMISSIONER: In crude terms the Black Box starts and extends further away - - -
45

ASSOC PROF PITTOCK: At a higher elevation, yes.

THE COMMISSIONER: - - - from the in-bank flow than the Red Gum.

5 ASSOC PROF PITTOCK: Correct.

MR BEASLEY: So you need a higher flow to reach them?

10 ASSOC PROF PITTOCK: Correct. So if as government policy, you're relying on this infrastructure to inundate the floodplain, there will be discrimination in favour of watering the Red Gum forests and against watering some of those wetland ecosystems higher up the floodplain like the Black Box forests. And to my mind, that offends the principle under both Conventions of conservation of representative areas of different ecosystems and species.

15

THE COMMISSIONER: I can't find in the statute a pick the winner approach to what is environmentally sustainable. Once one observes the use of the term and its definition of biodiversity it doesn't seem that you are able to say, "The Red Gums, we're going to look after 30 per cent of them, but we're not going to look after, say, 20 more than incidentally 5 per cent of the Black Box." I can't find anything in the statute that would enable that kind of political triage to be performed in relation to biodiversity.

25 MR COSIER: Mr Peter Cosier here. The reason you won't find it in the statute is that you're dealing with an existing – in this instance degraded – ecosystem. And so the public policy objective is to restore that degraded ecosystem which doesn't – well, usually in fact doesn't require a statutory response at all, it requires a financial or monetary response to fund the restoration action. So most of the conservation 30 policy objectives you will find in intergovernmental agreements or national strategies for biodiversity and the like, which are not statutory by their nature, but they are still nonetheless government endorsed policies.

THE COMMISSIONER: Aspirational.

35 MR COSIER: Many are aspirational because, you know, often it is how long is a piece of string?

THE COMMISSIONER: None the worse for that. We all need aspirations.

40 MR COSIER: Yes. So in – and I am sure we will come to this too – in the SDL adjustment process we identified 12 policies or 11 policies that we felt that had been adopted by government that the SDL project should be held against.

MR BEASLEY: Criteria.

45

MR COSIER: Criteria. Test it against those. So you won't find then in the statute either, but they are nonetheless government policies that - - -

THE COMMISSIONER: I've looked and haven't found any – or any, let alone any detailed, MDBA response to that, that looks at the exposition of those testing criteria.

5 MR COSIER: We had – we received a response from Mr Littleproud.

THE COMMISSIONER: No, MDBA.

MR COSIER: Did we - - -

10 THE COMMISSIONER: If any of you become aware of anything from the MDBA, which has scientists on staff – I'm not aware that Mr Littleproud does – responding to those testing criteria that you propose, I would be very – we would be very interested to know.

15 ASSOC PROF PITTOCK: I think – Jamie Pittock here, I think in relation to the SDL projects, the response we have had from the authority is that a different process for approving those SDL projects was agreed between the Commonwealth and State Governments, and we're disappointed in that response because we think the 12
20 criteria that we've drawn from their own policy statements provide a much more rigorous test.

MR BEASLEY: They're guidelines for feasibility study, they're guidelines for business cases etcetera, the contents of the Basin Plan itself.

25 ASSOC PROF PITTOCK: Yes.

MR BEASLEY: Yes.

30 ASSOC PROF PITTOCK: And so our concern is that the approval process for the SDL projects essentially means the states are approving each other projects and we have been concerned that the Murray-Darling Basin Authority has not had a veto or concurrence power, although - - -

35 MR BEASLEY: Although – excuse me - - -

ASSOC PROF PITTOCK: - - - they have clearly expressed deep concern about some of those proposals.

40 MR BEASLEY: I hate to go to the statute, but the statute does require it to be the Basin Authority that - - -

THE COMMISSIONER: Well, that's right.

45 MR BEASLEY: - - - proposes the adjustment, ie, that is the 605 gigalitres. Presumably, that's a decision that should be based on best available science and other things that should be considered. Anyway, sorry, I interrupted you.

5 THE COMMISSIONER: Could I just pursue one matter, I would like you to continue to elaborate. And here, it's no doubt my imperfect knowledge. If I have read it, I've not recognised it for what it is. Has the MDBA, to your knowledge, published what I will call their testing criteria for these measures that support adjustment?

10 MR BEASLEY: The answer to that has got to be yes, doesn't it, in terms of their three-stage approach to how these things are meant to be addressed. They've published guidelines that are called stage 1, stage 2, stage 3.

THE COMMISSIONER: But those stages don't seem to have been gone through, I think, with any of these measures.

15 MR BEASLEY: I can't see how they possibly could have.

THE COMMISSIONER: No. I thought – no, that's why I'm asking. Is - - -

MR BEASLEY: At least in relation - - -

20 THE COMMISSIONER: Was – has there been an alternative set of criteria applied? Because those stages actually involve testing for, if I may put it at its bluntest, environmental impacts, and that hasn't - - -

25 MR BEASLEY: Risk - - -

THE COMMISSIONER: And risk, and that hasn't happened.

30 DR STEINFELD: So – Celine Steinfeld here. So the phase 1, phase 2, and phase 3 assessment process has been a process that states have largely undergone through various committees. One committee was called the SDLAAC, and that committee was comprised of state – of state officials who had discussions on the evolution of the projects according to the phase 1, phase 2, phase 3 guidelines. The Murray - - -

35 MR BEASLEY: The SDLAAC. Is that what you are referring to, ma'am?

40 DR STEINFELD: The Murray-Darling Basin Authority did not have veto powers over the package of projects when states were resolving the package through that committee process, and ultimately it was BOC, the Basin Officials Committee, that proposed a package of what ended up being projects to the ministerial council. So throughout that process the Murray-Darling Basin Authority's role was to provide advice to Basin states on the consistency of those projects with the Basin Plan. Now, that advice has not been – had not been made public until an order for production in the Senate, which occurred on 7 February 2018, and that was the first time that the authority published detailed information – well, detailed information on the projects
45 was available.

Until then, business cases were not publicly available, and the Wentworth Group had done some assessments on the business cases, and we had sought information from the states, New South Wales, Victoria and South Australia. And some of the states did provide us with business cases, so we were able to do that assessment. But
5 overall, the Murray-Darling Basin's role was also to undertake the method for the package of projects. So working out how much of the supply contribution was in relation to the 36 supply measure projects and that information and the process that they undertook is detailed in the Basin Plan and particularly in schedule 6 that sets up the default method.

10

THE COMMISSIONER: Yes. But I haven't seen published the accomplishment of that process.

15

DR STEINFELD: Sure. So the Murray-Darling Basin Authority published the draft determination report during the consultation period and that sets out what I can see as the way that they have implemented that process and the modelling.

20

MR BEASLEY: I think what the Commissioner is getting at, though, is that the – apart from the Act requiring the Authority to propose the actual adjustment amount which clearly involves them – if they are able to say it's 605 gigalitres, they must have some understanding of the measures to come up with that figure as a proposal. But the Basin Plan itself requires, in relation to a supply measure, the authority to be satisfied of certain criteria, and one of those criteria is environmental equivalency. And the phase 2 business case assessment that you've – we have discussed says that
25 the business cases will be assessed, amongst other things, on the basis that the supply measure clearly describes the ecological justification for the operating regime. And if you look at the Menindee Lakes analysis, the first thing it says is, "We need an EIS." So it's very difficult to - - -

30

THE COMMISSIONER: That will do for me as an example, not least because it's a rather large, discrete item. Please correct me if I am wrong. I'm not aware of any publication or any published information that there exists some unpublished material which shows any of that being accomplished in relation to the Menindee Lakes measure. Am I wrong? Because all I can go on is what is either published or has
35 been made available by other means. If that is true, and it is the MDBA who could tell the world whether it's true or not, they could do it by press release. They don't have to come to the Royal Commission. If it is true, what I've said - - -

40

MR BEASLEY: Can you withdraw that phrase. "They don't have to come to the Royal Commission"? I'm not sure about that yet.

45

THE COMMISSIONER: The High Court will determine whether they have to come or not. I mean this seriously: that there is nothing to prevent the MDBA, if I am wrong in what I'm suggesting, namely that there has not been accomplished what the Act and the Plan require with respect to adjustments based upon measures, with respect say to the Menindee Lakes. Then it would be tremendously simply
presumably by correspondence with the Wentworth Group, as well as with the world,

to announce that. Are any of you aware of anything by way of response on the part of the MDBA – not the Minister, the MDBA – in relation to the processes it is required to carry out for these adjustments?

5 MR COSIER: No, is the answer, Commissioner. Commissioner, can I add that the process that you've described, which is the one that we referred to ad nauseam in our submission as the lack of transparency in process, is not only with regard to the SDL adjustment processes, it goes right back to the draft Basin Plan, right back. And I referred to letter we wrote to the Prime Minister in 2011 and we made this
10 observation then. So this is December 2011 with regard to the draft Basin Plan. This is – I'm just giving – this is a now an embedded history in the process of the lack of transparency. This draft Plan is not based on science.

15 It does not pass the most basic requirements for an environmental impact statement, let alone guide the long-term health of water resources across the Murray-Darling Basin. Our belief was it should not have been allowed on public exhibition, so we asked the Prime Minister to withdraw the Plan. We formed the view that the absence of critical information makes it impossible for the community, science or Parliament, to understand its implications or have confidence that the plan has any prospect of
20 delivering a healthy, working river. And we elaborate on that. So this is the history of how governments, both state and Federal, have been treating the reform process since the – what we call the debacle of the Guide.

25 THE COMMISSIONER: Now, that was a fairly serious description by the Wentworth Group of a state of affairs in government administration, which is required to be based on best available science. Are any of you aware – have you had any engagement either by conversation or more formally with anyone currently at the MDBA to answer that rather serious charge by the Wentworth Group?

30 MR COSIER: Well, subsequent to that correspondence, we did have a meeting with the Minister, but that was essentially the entirety of the process that - - -

35 THE COMMISSIONER: Again, I distinguish between the Minister, who is not the MDBA.

MR COSIER: Yes.

THE COMMISSIONER: And the MDBA, which is emphatically not the Minister.

40 MR COSIER: Yes. We had no correspondence at that time because, as we have already given evidence, we had withdrawn from the Murray-Darling – from the Basin Testing Committee and were not engaging in the process with the authority at that stage, because we believed the process was fundamentally flawed.

45 THE COMMISSIONER: My point is that here was a – and I remember it happening – here was a public, I think the word is denunciation, by the Wentworth Group of government processes at which the MDBA was right at the centre.

MR COSIER: Correct.

THE COMMISSIONER: With statutory responsibilities.

5 MR COSIER: Correct.

THE COMMISSIONER: And is it true that none of you four can recall any public or private defence of which you became aware on the part of the MDBA against those allegations?

10

MR COSIER: I'm certainly not aware of any.

PROF THOM: No.

15 MR BEASLEY: I think in fairness, there has been a number of press release type material asserting that the work of the Authority is based on the best available science.

20 THE COMMISSIONER: Each and every one of which we will no doubt attend to in the report, but none of which condescends to any particulars in relation to, for example, scientific justification where you had said – the Wentworth Group had said – scientific justification appears to be lacking. I have to draw an inference about the conduct of the MDBA and its fitness in its present form to deliver on the plan, just as I have to consider the fitness of the Plan to deliver on the Act. And it does seem to me that if the MDBA, as a statutory entity with statutory responsibilities, has a pattern of shortcoming, then that is part and parcel of me answering the question: will the Plan deliver the what's the prospects of the Plan being delivered?

25

30 MR COSIER: Commissioner, I'm referring to the Senate rule in Regional Affairs Committee hearing into the draft Basin Plan where, as I recall, a number of – if not all of our allegations and assertions were put to the Authority by that committee. So it might be useful for you to refer to that.

35

THE COMMISSIONER: Yes. We're aware of it, yes.

MR BEASLEY: There were recommendations made about justifying 2,750 and doing it in plain English and - - -

40 THE COMMISSIONER: That's a committee, not all of whose recommendations have been accepted by government?

MR COSIER: That would be putting it mildly, your Honour.

45 THE COMMISSIONER: In my normal way.

ASSOC PROF PITTOCK: Commissioner, Associate Professor Pittock. The other comment I would make is that the CSIRO peer review of the 'Ecologically

Sustainable Level of Take' report from 2011, although predating the draft Basin Plan, for a scientist reading this, I find that review quite damning in terms of expressing very clearly to me a number of failings in the science that was adopted.

5 MR BEASLEY: Yes. Just so you know, Commissioner - - -

THE COMMISSIONER: Is that RCE9?

10 MR BEASLEY: No. Hang on yes, it is.

THE COMMISSIONER: Thank you.

15 MR BEASLEY: Yes. Which I referred to in opening and we've referred to on a few occasions.

THE COMMISSIONER: Yes. Well it included at its page 5, in the 'Executive Summary', this summary:

20 *Given the current evidence base, the level of take represented by the 2,800 giganlitre reduction scenario is not consistent with the hydrologic and ecological targets provided in the review.*

25 And that is to cherry-pick, unashamedly, one sentence. But nothing else in the context detracts from the ordinary English language of that. Which seems to, I would have thought, stand in the way of accepting 2,750 as a level which would not compromise, among other things, the ecosystem assets and outcomes.

30 ASSOC PROF PITTOCK: Yes. We agree. And I note also their comment that the work lacks a biophysical classification able to demonstrate that the indicator key ecosystem asset and key ecosystem function indicator sites adequately represent the full range of ecosystem types across the Basin. Which, to my mind, gets to the heart of the Water Act attempting to honour Australia's obligations under international conventions for biodiversity conservation.

35 MR BEASLEY: Sorry, something just – your Honour mentioned the term “the Act doesn't direct”.

THE COMMISSIONER: Fortunately, I'm not and never will be “your Honour”.

40 MR BEASLEY: That was because – I'm going to blame Professor Pittock for calling you your Honour a minute ago. So he has done “your Honour” to you, and Special Counsel to me. As long as you don't say Adjudicator Beasley, because that would really – I got that somewhere. Remark. Be a typical... I don't think it was from the Mayor, it was someone else. Just in relation to a comment about picking
45 winners and losers the Act does, in the definition of ESLT, it does have a definition of environmental asset but it doesn't have a definition of a key environmental asset.

ASSOC PROF PITTOCK: No.

MR BEASLEY: To that extent, there is a form of discretion or judgment to be exercised as to what is a key environmental asset. Although that, of course, has to be
5 informed by the other objects of the Act like implementing our international obligations. So they're going to identify many things that are key in any event.

THE COMMISSIONER: Yes.

10 MR BEASLEY: One thing that I think we've discussed at length is that it would be a very odd decision to define a key environmental asset on an economic outcome – or a social outcome. But in any event, can I move back to the June 2010. We're going back in time now.

15 THE COMMISSIONER: You can try to do whatever you would like.

MR BEASLEY: It doesn't matter. I don't mind being side-tracked. I'm just going to doggedly come back to it, when I have to, but about two hours ago I was on page 1 of the June – and there's – don't think I'm suggesting for a moment that the last two
20 hours haven't been spent usefully, they have been. But I would like to come back to the June 2010 work of the Wentworth Group and, in particular, what I was drawing attention to, first of all, was page 1 with the statement of “approximately 4,400 gicalitre needs to be recovered for the environment”. There's – on page 1 in that bottom right-hand paragraph of this publication, it says:

25 *Ie, 4,400 gicalitre long term cap equivalent.*

With a footnote 4, which indicates that:

30 *Unless otherwise stated, all water volumes within the text of this document are in long-term cap equivalents.*

There's a further explanation of what that means. If, however – sorry, back to page 1, it says:

35 *A 4,400 gicalitre amount of water for the environment would create an equivalent of a cap of approximately 7,170 gicalitres.*

And on page 13 of this report – sorry, this publication, you've already taken the
40 Commissioner to this page in relation to the two-thirds rule of thumb and that quote from the 2002 report that we discussed. And on the right-hand page, fourth paragraph, it says:

45 *To achieve a level of two-thirds natural flow in all catchments of the Basin the environment requires a share of the existing cap on diversions of approximately 4,400 gicalitres. The current cap on diversions in the Basin is 1,576.*

Hence the figure 7,170 back on page 1. The MDBA made some commentary about your figures here in the ESLT report. I just want to make sure whether you feel as though they've been fair to the Wentworth Group opinion. And so I'm drawing your attention to exhibit RCE6, which is the MDBA's publication, the 'Proposed
5 Environmentally Sustainable Level of Take'. I will just get that document. Is there a preference to who I should direct this question to, about whether the MDBA is being fair in what it said about the Wentworth Group work?

10 MR COSIER: I think it will be to me, but it may well be – my suggestion that you - - -

MR BEASLEY: It can be any combination of you.

15 THE COMMISSIONER: Please all of you feel free to supplement, disagree, just say what you think.

MR BEASLEY: So if you turn to page 60 of this exhibit. When you have that, you will see fourth paragraph down, the MDBA says in its 2010 report, and that's the one we've just been – I've been taking you to:

20

The Wentworth Group undertook an end of system flow assessment –

etcetera. Then the paragraph below that:

25

*The Wentworth Group indicated that the flow predicted work and end of system flow analysis pointed to similar findings. The end of system flow analysis indicated the reduction in diversions of 4,400 gicalitre compared to cap conditions as required by the environment and these findings supersede the findings of the 2008 report. The Wentworth Group's assessment used cap conditions as a baseline. The baseline for the MDBAs assessments takes into account water recovered between the establishment of the cap in '93/4 and June '09, as set out in table 6.2 on the next page. In total, 823 gicalitres of water recovery for outcomes in the Murray-Darling Basin is included in the MDBA's baseline conditions which was not captured in the base line
30 underpinning the Wentworth Group's assessments.*

35

So going over the page, they're suggesting that your 4,400 figure needs to be reduced by the 823 in terms of water recovered. That's not how I read your June 2010 report. I read it as being 4,400 gicalitre reduction on the then cap. But have I read that
40 wrong and is what the MDBA are saying here that you are really saying 3,525 at the higher end, rather than 4,400, is fair?

MR COSIER: I'm reluctant to give an answer to that, and I would - - -

45 MR BEASLEY: You can consider that over lunch if you want to take that question on notice.

MR COSIER: My suggestion would be to ask Dr Williams who was a member of the Wentworth Group when we produced this report, who has far greater expertise in the hydrological assessment than I do.

5 MR BEASLEY: One, we can do that and, secondly, I can come back to that question if you want to give that one – take that on notice.

MR COSIER: Well, I'd be reluctant to give an answer for the following reason.

10 MR BEASLEY: No.

MR COSIER: That is, clearly, quite a technical question.

MR BEASLEY: Yes.

15

MR COSIER: To which I don't have the qualifications to answer without consulting people such as Dr Williams.

20 MR BEASLEY: All right. Does anyone else want to say anything in relation to the point I've just raised at the moment? No. All right. Let's take that on notice. We can clarify it with Professor Williams and you can - - -

25 MR COSIER: The only observation I would make, and we have had this discussion a number of times earlier this morning, is that our 2010 report was produced before the Guide to the Basin Plan.

MR BEASLEY: Of course. Yes. Yes.

30 MR COSIER: And it was based on the rule of thumb that we have been talking about. So we're talking about changes to the rule of thumb, rather than any scientific analysis for which the Guide – so, in our view, the Guide to the Basin Plan superseded our 2010 report, in terms of the suggestion of to what the ESLT should be or might be.

35 MR BEASLEY: Of course.

40 THE COMMISSIONER: Talking about superseding, can I ask you about – back in 2002, the expert panel report to the Murray-Darling Basin Ministerial Council, which I think has also been referred to today as Jones and others, 2002, which referred in general terms to an estimate of 2,000 to 4,000 ggalitres as what I might call, necessarily, the term. That's all in very general terms. I think – is that confined to the Murray, as opposed to the Murray-Darling or should I understand that as being Murray-Darling?

45 ASSOC PROF PITTOCK: I don't know the answer to that. I'm sorry.

THE COMMISSIONER: You'd find an explanation in the text of the - - -

ASSOC PROF PITTOCK: Yes, indeed.

THE COMMISSIONER: Thank you. I've not come across any recent, over the last 12 months or so, statement by anybody, let alone from the MDBA, that that 2002
5 work has any current validity. I don't mean by that that it was wrong – whatever wrong means. I just mean that science has moved on from 2002 and that to proceed on the basis of what the statute calls the best available science would positively forbid you to say, "Look what they said in 2002, that's where I will stop looking."
10 Am I right in understanding that that is how the science - - -

MR COSIER: No, with respect, Commissioner, I would like you to answer my questions more often because that's exactly the point. The point was that the Guide, the science that went behind the Guide and, whilst there are crimes of the science in the Guide and we have criticisms of the science in the Guide, it represented a vast
15 improvement in our knowledge and understanding of the river system compared to these two or three papers. So to give an example of how the science - - -

MR BEASLEY: That has to be right, doesn't it, in the sense that the 2002 paper wouldn't have had the benefit of all the work that went into identifying what are the environmental assets we have got to protect. What are the ecosystem functions – all of that work.
20

MR COSIER: That's actually correct. All the work that CSIRO had undertaken
25 - - -

MR BEASLEY: Yes.

MR COSIER: - - - in that 10-year period as well. So in many scientific publications, you will see 20, 30, up to 200 references to back up a paper. We have
30 one reference or two references on which to base that 2002 basis. You go to the Guide, though, and you're talking about models being built, the processes of determining what key assets are. What's an environmental asset in our language is a biophysical feature in nature that provides benefits to society. So if you go through those processes. From those processes, you then say, okay, what condition do those
35 assets need to be in to provide those benefits – those assets to provide benefits to society. What condition are those assets in now, and what do we need to go to from there to there, and how do we codify those outcomes, and that was the process that the Guide used to establish those processes. That's how they were able to come up with a very wide range because of the great scientific uncertainty at the time.
40

MR BEASLEY: I suppose another reason would also be that back in 2002, whatever work was being done then in terms of how much water is needed for the environment wasn't in the context of the Basin Plan. The requirement upon which its validity... be based on of implementing international agreements and all the
45 obligations we have under those.

THE COMMISSIONER: Well, now - - -

MR BEASLEY: Just say yes, if you agree.

MR COSIER: Yes.

5 MR BEASLEY: Thank you.

THE COMMISSIONER: Well, now, as we speak, the plan seems to be headed
towards or below 2,000 gegalitre recovery. Sometimes, it has been talked about as a
3,200 gegalitre plan. I presently don't entertain much optimism of that ever being
10 true.

MR COSIER: Well, Commissioner, our – so in our submission, you will note that

15 MR BEASLEY: Had you finished your question? Sorry to interrupt.

THE COMMISSIONER: No, that's all right. No, no. No, it's ---

MR COSIER: Well, at a critical point in our submission, we made the statement
20 that, whilst we were strongly critical of the process in determining the Basin Plan, we
accept the democratic decision of the Australian Parliament that they had a right –
science informs decisions; it doesn't make decisions. We have no right to insist on a
decision. So we accepted the decision of the Parliament. It's not like Parliament was
unaware of the decision they were making at the time from us and others in that
25 process. We accepted that process. From that point onwards, we have said in our
judgment, if the Basin Plan, as it is currently constructed, is delivered in full and on
time, as is the commitment of the Prime Minister and, through him, the commitment
of COAG, then there will be a demonstrable improvement in the health of the river
system. So to us, the challenge today is how do we get that 2,300 gegalitres or
30 equivalent environmental outcomes actually happening in real water, not model
water, to advance water reform in the Murray-Darling Basin.

THE COMMISSIONER: Can you just explain how you get to 2,300?

35 MR COSIER: Sorry, 3,200.

THE COMMISSIONER: 3,200, thank you. So that you have referred there to, what
I might call, Wentworth Group discontent with it not being at least 3800, and I say at
least 3,800; is that right? I've understood that correctly?
40

MR COSIER: At least 3,800 with the conditionality that the ground water
extraction has no impact on river water.

THE COMMISSIONER: Thank you. Well, now, if, as seems to be the case at the
45 moment, the Plan such as it is, seems to be headed to being either around 2,000 or
even less gegalitres recovery per year, is there, apart from the completely superseded

Jones and others 2002, any published science of which any of you are aware that would support 2000 or less?

5 ASSOC PROF PITTOCK: Associate Professor Pittock. No, there's no science that would support 2,000 gegalitres or less as - - -

THE COMMISSIONER: The recovery.

10 ASSOC PROF PITTOCK: - - - the recovery that would sustain key assets that Australians have said are important to them.

MR BEASLEY: Even the Authority has said that, in its own work, when it's done 2,400 gegalitre scenarios so - - -

15 ASSOC PROF PITTOCK: Yet, the Wentworth Group's view is that there are a number of measures envisaged in the Basin Plan and associated programs that would be substantial improvements. When we last checked on the funds that remain unspent, there's something like \$5 million unexpended in federal moneys allocated to implement the Plan, and if that were well targeted and directed at key elements
20 such as constraints relaxation that free up the system to deliver environmental benefits, then our view is that it is possible to achieve progress and that that can then inform the revision of the Basin Plan that is scheduled by 2026 so that we get a better and even more science-based plan in the next iteration.

25 THE COMMISSIONER: Thank you.

MR BEASLEY: Just on the point you just made about money left and spending it well, even back in this report in 2010, if I can direct your attention to page 4 and the three options that were discussed: option 1 being continuing with the government's
30 Water for the Future Program involving separate funding for buying allocation, 3.1 billion, or efficiency programs, 5.8 billion; option 2, combining the separate options into a single fund to purchase environmental water through the most cost effective means; and (3) combining the separate funding programs into a single fund and working with local communities to acquire water for a price equivalent to a
35 reasonable term whilst on profits and funding and economic development program to assist regional communities transition to a future with less water, option 3 was the group's preferred option; correct?

MR COSIER: Correct.
40

ASSOC PROF PITTOCK: Yes.

MR BEASLEY: And option 2 was picking up, I assume, the knowledge then which has been discussed and reported on by economists and others since that, first of all,
45 efficiency measures are considerably more expensive means of recovering water than a buyback; correct?

ASSOC PROF PITTOCK: Yes.

THE COMMISSIONER: And I think Professor Williams has done some work suggesting at least two and a half times more expensive.

5

ASSOC PROF PITTOCK: Yes, and the Productivity Commission, if I may add, has also looked at this.

MR BEASLEY: Yes. 2010, they said buybacks were the way to go. Obviously, I'm paraphrasing, but - - -

10

MR COSIER: Mr Beasley, can I - - -

MR BEASLEY: Yes. Of course.

15

MR COSIER: - - - take you back a step because I wouldn't like our answers to be misconstrued?

MR BEASLEY: Sure.

20

MR COSIER: Of course, buying water is more efficient, but it may not – may not – be socially or economically equitable.

MR BEASLEY: You've got to do it the right way.

25

MR COSIER: You've got to do it the right way. So to try and keep the conversation simple and the point 4 in this paper, so the 2010 paper, we produced it for two reasons: (1) to say what the science said we believe you need, but also to put forward a process by which we believe you can achieve the original vision of the National Water Initiative of improving economic wealth and enhancing environmental sustainable ability, and that is through a – what would, in the jargon, be called an industry development model. Right. Australia has a history of industry development programs.

30

Here in South Australia, the Playford Plan, created the white goods industry in South Australia, is an example of government intervention into the market to create wealth. If you look at the Button Car Plan, how to transition the Australian car industry to a new industry is another example of an industry. The closure of the BHP Steelworks in Newcastle. There's another – there are many, many examples where industry development programs in Australia have been very successful. The success of those was the public, the taxpayer is asked to fund in the public interest transitions – transitions from one state to another state, from one district to another.

35

40

MR BEASLEY: Yes.

45

MR COSIER: We believe that the same principle should have been applied to the implementation of the Basin Plan. What we saw instead, though, we had one arm of

government spending the \$10 billion and another arm of government implementing the Basin Plan, and the two weren't talking to each other. So we put forward this
- - -

5 MR BEASLEY: And if I can add to that, State Governments having the programs in relation to efficiency measures, the Commonwealth was funding it.

MR COSIER: That's correct.

10 MR BEASLEY: There's another level of government involved in actually deciding who is the winners in those.

MR COSIER: Precisely.

15 THE COMMISSIONER: Now, I may not have followed quite correctly. The idea of a buyback is that, without any compulsion, it's not compensation for compulsory acquisition; it's an offer which need not be accepted.

MR BEASLEY: Voluntary.

20

THE COMMISSIONER: Yes.

ASSOC PROF PITTOCK: Yes, that's right.

25 THE COMMISSIONER: The idea of a buyback is that accepting the conceptual footing of a bargain, the price is set by agreement which the vendor, the person giving up, I will say the permanent water, thinks it is an appropriate price for giving up all those advantages, short-term, medium and long-term. Leaving to one side, at the moment, the very interesting and important points you make about what I will
30 call a disaggregated approach, what's wrong with a view that says: "Well, for those who have accepted buyback, they have been fully compensated because that's the price they considered their interests would be reflected in"?

35 MR COSIER: Well, that's obviously correct. What it doesn't take into account, however, is that the decision of that individual of their own free will to sell water has flow-on implications to other businesses and communities, particularly - - -

40 THE COMMISSIONER: I will come to that in just one moment, because there's another Royal Commission going on, so one can't leave out an account that what we talk – when we talk about decisions as a matter of free will, we may talk about somebody who is in receipt of a letter of demand from their bank requiring them to sell everything except their children in order to avoid bankruptcy. So I don't mean any of that flippantly. These are choices that have been made sometimes in horrendously fraught positions, but they are still – in our system of law and
45 economics they are still voluntary, free decisions that set a price. The – all of those decisions together make a market.

Now, I can well understand a view that says maybe we need to look beyond prices of buybacks in order to ensure that certain sectors of the population don't unfairly bear a burden of something that benefits all of us. I do mean all of us. This is not just the people who live in the Basin. It's also the people who live in a nation made
5 prosperous by the Basin and eat its products or wear its products.

MR COSIER: And future generations.

10 THE COMMISSIONER: And future generations, quite. And no doubt in my report I will be at least giving some attention to the question of adjustment costs, transitional costs, compensation perhaps. But I am interested in the unpopularity that I have seen, heard – literally – and read of buybacks. It has produced this notion of closing a gap between what they were able to achieve with buybacks and what the Plan required.

15

MR COSIER: So there's several responses - - -

THE COMMISSIONER: And that led to these measures which seem to have produced, without much scientific basis - - -

20

MR COSIER: So there's several responses to that.

THE COMMISSIONER: - - - pretext for closing the gap, not by getting more water back, but by saying, "The water that you've got will be more effective
25 environmentally." Which I would have thought required science to have any

MR COSIER: So the cap on buybacks has been a political response to fear in the regions that further buybacks will cause economic and social harm to those districts. Dr Steinfeld will be able to give you some more detailed explanation of the causes of that process. We commissioned some work as part of our review of the Basin Plan into that. A lot of the – and there is no doubt that buybacks – I'm sorry, the Basin Plan, does have economic impacts. Of course it does.

30

THE COMMISSIONER: The whole idea is that there will be less water used
35 consumptively.

MR COSIER: Yes. So of course it has economic impacts. What has been underestimated in that political controversy is the earlier impacts of the benefits of creating permanent property rates and freeing trade. So the trade of water from
40 lower uses to higher uses also has economic and social impacts on the communities where water is traded from and benefits to communities where water is traded to. The anecdotal example was, in the middle of Millennium Drought, they were planting grape vines in Griffith because water has been trading to a higher and better use as part of that process. That all got mixed up in the Basin Plan, and the Basin
45 Plan got the blame for that, but can I quote you Prime Minister Howard, when he launched the \$10 billion Basin Plan in 2007. Quote:

There is no point sugar coating this: Enhancing the overall viability of irrigation will require structural adjustment.

5 THE COMMISSIONER: Structural adjustment is a euphemism, though, isn't it?

MR COSIER: Structural adjustment means commencing communities who are adversely affected by a government decision.

10 THE COMMISSIONER: Well, I hope it always means that politically, but I think the phrase is usually used to describe people being sacked.

15 MR COSIER: Well, if I could give you the whole context – and I don't believe the Prime Minister meant that in this case, to be honest – back to our proposition: the key point of your comment, Commissioner, was "we". So when we say "we need to do", who is "we"?

THE COMMISSIONER: Yes.

20 MR COSIER: And our argument was "we" is a consultative process with communities, not imposing decisions on communities. Whenever governments try and impose decisions on communities you get the obvious reaction, like every human being does when you are told do something, and you say you don't want to do it.

25 THE COMMISSIONER: Then there's a triennial or quadrennial election. Yes.

30 MR COSIER: So the "we" is if the process of the water reform in the Murray-Darling Basin was – as was originally conceived, was an industry development program, it would have done, "we" being in consultation with the community. Instead, you had Commonwealth agencies imposing Guides, imposing Basin Plans, imposing buybacks – for which many couldn't be justified – and imposing all these other programs on those communities. And we went to great lengths to try and argue that a consultative approach within each of the Basin communities would deliver a far better environmental, social and economic outcome.

35 THE COMMISSIONER: And in many ways that horse has bolted.

40 MR COSIER: That horse has bolted, but we were of the view – turning to your comment about buybacks, that those communities would self-offer buybacks, but they would be organised instruction buybacks. They wouldn't be random buybacks, there would be an organised, planned buyback by shutting down certain irrigation districts and moving that water to more viable irrigation districts. So an industry developed plan process, rather than a random Commonwealth intervening in the water market when anything happened to pop up.

45 THE COMMISSIONER: When you say shutting down water in one area and moving to another, when I mean buyback, I mean taking the water out of consumptive use anywhere.

MR COSIER: Yes. But an example would be if you've got a channel, and you've got several irrigation districts in there. If someone at the end of the channel – at the end of the channel – at the end of the channel.

5 THE COMMISSIONER: Well, anywhere on the channel.

MR COSIER: Sells their water. All of a sudden, everybody else who is consuming water needs to pay more to get the water delivered to them.

10 THE COMMISSIONER: The Swiss cheese effect. I understand that, I think.

MR COSIER: The Swiss cheese effect.

15 THE COMMISSIONER: What I don't quite understand is how it led to, apparently, the destruction of buyback as a viable option.

MR COSIER: Well, as I said, we – in our review of the Murray-Darling of water reform in the Murray-Darling Basin, we commissioned an economist from the Australian National University to look into that question. And as I said, yes, the Basin Plan has had economic impacts on communities, but a lot of the blame on the Basin Plan actually lies in the other processes of industry adjustment as a consequence of the of the permanent property rights in the trading of water throughout the Basin.

25 THE COMMISSIONER: Is that a convenient time?

PROF THOM: Could I just add - - -

30 THE COMMISSIONER: Sure.

PROF THOM: - - - another dimension to – Bruce Thom speaking. Another dimension to the sort of buyback issue, and the political fear that might have arisen in relationship to this, and this is the issue of the upstream states seeing little value in environmental water going downstream, and particularly into South Australia and going out to sea. And the issue here from the Wentworth perspective is that we have always treated the Basin as a total interconnected system. And there is nothing we see in the Basin Plan, or even in the Water Act, that says that any part of the system should be sacrificed to another part.

40 THE COMMISSIONER: Quite so.

PROF THOM: So in that connection we have experienced, through discussions with politicians and some people in community, some irrigators, the issue that the water is primarily there for economic purposes. It's not there to provide for further water to go downstream to look after ducks or fish, because that's a lower economic and not a useful purpose for the Australian economy. This is a food bowl. It doesn't require being healthy to be a food bowl. Now, that particular perspective I think has

entered into a lot of people's minds and has really resonated to the extent that any further buybacks will be disadvantaged to the communities along the river system.

5 And, of course, this is where we would argue, for a whole range of reasons which we may go into later, in particular why the water needs to go through the South Australian – over the Victorian/South Australian border into the Lower Lakes and out to sea, why that is valuable.

10 MR BEASLEY: There's no one going to forget to raise that. Thank you.

ASSOC PROF PITTOCK: Commissioner, may I also add to this question about socio-economic impacts. Associate Professor Pittock. We don't believe the horse has bolted. We consider that, with \$5 billion of funding left, the Federal Government still has the opportunity to take a different approach to implementing the Basin Plan well.

15 MR BEASLEY: Well, the extra 450 gigalitres is based on efficiency measures and that – they – there's other options than that, as an example.

20 ASSOC PROF PITTOCK: There are other options.

MR BEASLEY: Yes.

25 ASSOC PROF PITTOCK: And so in our economic assessment of communities that have been impacted by the Basin Plan, the work undertaken for us by an ANU economist, essentially what that found is a number of communities have actually done very well economically in terms of employment in the period since the Basin Plan has been implemented, and Griffith is a good example where agricultural employment has actually increased following the Basin Plan implementation.

30 However, there are some smaller communities in the Northern Basin that have been negatively impacted. They have been impacted by a range of things and not just the Basin plan. To give you one example, when round baling cotton machines were introduced into the cotton industry, that reduced the demand for seasonal labour by 75 per cent.

35 THE COMMISSIONER: Yes, all right.

40 ASSOC PROF PITTOCK: So – but what we are argue is that some proportion of the remaining funds should be made available to work with those local communities, those ones that have been negatively impacted, to identify public investments in their districts that the community wants, that would meet particular needs, that would enable a move away from some portion of irrigation into other practices.

45 THE COMMISSIONER: Yes.

MR BEASLEY: Thank you. 2 o'clock.

THE COMMISSIONER: Thank you very much. See you at 2.

ADJOURNED

[1.08 pm]

5

RESUMED

[2.02 pm]

10 THE COMMISSIONER: We're ready to go.

MR BEASLEY: I'm not going to deal with this now, but I've been given a copy of
- - -

15 THE COMMISSIONER: Can we go straight to this evidence?

MR BEASLEY: We can. I was saying I would not deal with it now but there is a
letter from – all right. That will have to remain a mystery until tomorrow morning
what I'm talking about. My apologies. So I was on your options 1, 2, 3 on page 4 of
20 the 2010 publication that we had been dealing with. My only point in relation to
both options 2 and 3, though, was that one of the things the Wentworth Group
considered needed to be considered is the cost effectiveness of any measure to
recover water; correct?

25 MR COSIER: Yes.

ASSOC PROF PITTOCK: Yes.

MR BEASLEY: One of.

30

MR COSIER: But within the context of - - -

MR BEASLEY: Within the context of what you have said according a cost benefit
based environmental benefits index.

35

MR COSIER: Yes, but within the context of an industry development program as
distinct from a free market acquisition of random purchases of water.

MR BEASLEY: Yes, all right. And in relation to efficiency measures, was it any
40 part of the Wentworth Group's thinking at this stage some of the work that has been
done by Professor Williams and Professor Grafton throwing doubt, at least in their
published work, about the reliability of efficiency measures for recovering water or
was that something that has been factored in later?

45 ASSOC PROF PITTOCK: Associate Professor Pittock. That issue has really only
been addressed in the past two years.

MR BEASLEY: I thought so, yes.

ASSOC PROF PITTOCK: And it's an area where Professor Grafton and Professor Williams have a great deal of expertise and we would defer to their judgment.

5

MR BEASLEY: All right. Thank you for that. I just think page 11 is important of this document in relation to at least putting in context the health of the river valleys at the time that a draft plan is being prepared and you've got a table there, that I think if you look at the footnote it's from the 'Sustainable Rivers Audit' of 2004 to 2007
10 which was published in '08 which indicates that of all of the rivers in the Basin at the time, only the Paroo was in good condition, only Border Rivers and Condamine in moderate conditions and all of the other 23 are either in poor or very poor condition.

ASSOC PROF PITTOCK: Yes, that's correct.

15

MR BEASLEY: Noting that 2004-2007 would have incorporated not all of, but some of the impacts of the Millennium Drought including, I think, 2006 was the lowest recorded inflows in, since settlement.

20 ASSOC PROF PITTOCK: Yes, that's correct. Although, some of the indicators could be regarded as being independent of drought conditions.

MR BEASLEY: Sure. I just wanted to ask you this: the sustainable rivers audit – and any one of you can answer this the sustainable rivers audit has been abolished.

25

MR COSIER: Yes. So the history of that is that New South Wales' Minister Katrina Hodgkinson withdrew the New South Wales funding share of the Sustainable Rivers Audit, and as a consequence of that - - -

30 MR BEASLEY: Just pausing there, did she announce a reason why, to your knowledge?

MR COSIER: I can't recall the reason – you can?

35 DR STEINFELD: There's some information about this in the joint programs funding from about 2013. I can find the document and provide that to you.

MR BEASLEY: All right. Thank you.

40 MR COSIER: As a consequence, the Murray-Darling Basin Authority then abolished the Sustainable Rivers Audit so we had the paradox that we are spending \$13 billion, we have a Basin Plan, we have major industry adjustment and we have no measure of success.

45 MR BEASLEY: That's what I wanted to ask you about. I think we discussed before lunch the recent May publication of an update on the condition of the six icon

sites from the Living Murray but has there been anything that has replaced the Sustainable Rivers Audit?

5 ASSOC PROF PITTOCK: This is Associate Professor Pittock. Nothing of equal substance in terms of independence and in terms of scientific rigour and that's a major failing at the moment.

10 MR BEASLEY: Can you expand on that, on why you are saying it's a major failing?

ASSOC PROF PITTOCK: We believe that if the Australian public are spending \$13 billion to achieve a change and that many communities are undergoing some stress as a result of that change that we should all be assured that the program is either on track or if it's not on track that there are lessons being learnt to adjust the program. That was one reason why we undertook our review of Basin Plan implementation last year because there was this gap in the government endorsed systems.

20 PROF THOM: Professor Thom.

MR BEASLEY: Yes. Go ahead.

25 PROF THOM: I think that we have a history in federal and state levels of programs being established and then being disestablished. I'm reminded, as I mentioned earlier today, the very powerful land and water audit that the Federal Government established back in the times of late 1990s, and early 2000s, and for whatever reasons, maybe it was part of an efficiency audit or something of that nature, it got abolished. And yet it had the capacity to show the nature of changes in our environmental health as well as the relationship of that to productivity and population growth, that was world class, absolutely world class. I've still got the – I keep the volumes at home because it was a voluminous bit of work.

30 The same with the Sustainable Rivers Audit. I mean, we had a system in place that could have been funded under the current funding arrangements, if it was so desired, that would have maintained the sorts of things that we in Wentworth Group have been advocating and feel should continue into the indefinite future. There seems to be a thing in Australian government circles – and it applies to CSIRO as well – that maintaining auditing programs like this is not what the taxpayer should be funding. Doing projects, yes. Sustainable Rivers Audit, a project, finished, done, out of the way, forget it.

35 But the sorts of things that we feel are vital to maintaining the health of our environmental systems, not just in the Murray-Darling Basin but more broadly, captured at a national scale particularly as we move into this new climate era becomes fundamental and we in the Wentworth Group of course have underpinned that with our very substantive work on environmental accounts. So there is a

systemic issue in the relationship between the Commonwealth and states in sustaining auditing type programs that is very, very difficult to overcome.

5 MR BEASLEY: Thank you. Do you want to add to that?

MR COSIER: Managing the health of the Murray-Darling Basin rivers without the Sustainable Rivers Audit would be like trying to manage the Australian economy without the national accounts. It's just not possible.

10 MR BEASLEY: You don't know what's happening.

MR COSIER: It's not possible because you don't know what's happening.

15 MR BEASLEY: Basin-wide you don't know what's happening.

MR COSIER: Basin-wide.

20 MR BEASLEY: Absent, I suppose, academics or researchers going out funded in another way and doing investigations in relation to parts of the Basin.

MR COSIER: Yes, but it's anecdotal.

MR BEASLEY: Sure.

25 MR COSIER: And it's then contestable and we're back to where we are.

30 ASSOC PROF PITTOCK: Associate Professor Pittock. If I might add that although there is some level of authority funding for some academics to do some research on, for example, where environmental water has been applied, what's different about that is the extent to which it is controlled by the funding agency. What has been excellent in the past, for example, with the Murray-Darling Basin Commission has been where a highly authoritative group of experts have been funded at arm's length to come up with independent advice and that's what we're currently missing.

35 MR BEASLEY: Thank you. I want to turn now to the Wentworth Group publication statement on the 2011 draft Murray-Darling Basin Plan published in January 2012. This is the publication, I think we discussed before, where the group was calling for the Plan to be rejected. This document was obviously prepared both after the Guide was published in late 2010 and also after the ESLT report was
40 published in, I think, October 2011. And I assume was largely driven as a reaction to that second report, both as a standalone but also in the context of the publication of the Guide.

45 MR COSIER: Yes.

MR BEASLEY: All right. And can I ask in relation to this particular report: was it again like the previous one, a joint report, a collaboration between all members of the Wentworth Group?

5 MR COSIER: Yes, it was.

MR BEASLEY: All right.

10 MR COSIER: And if you go to page 2, it was also in association with Mr Tim Stubbs.

MR BEASLEY: Right. Yes. Okay.

15 MR COSIER: Ms Ilona Millar

MR BEASLEY: She is a lawyer, correct?

20 MR COSIER: She is a climate and water law expert at Baker and McKenzie. And at that time Mike Young was a member of the Wentworth Group but was not a signatory to this paper.

25 MR BEASLEY: All right. I just want to just draw your attention to a couple of statements in this report and then come back to why the view has been formed. Starting at page 1 of this publication, third last paragraph, you are talking about:

30 *The good work done by the Basin Authority has not been capitalised on to develop a comprehensive and transparent draft Plan. Instead the MDBA ignores much of the good work and has instead produced a draft Plan that manipulates science in an attempt to engineer a pre-determined policy outcome.*

THE COMMISSIONER: A political outcome.

35 MR BEASLEY: Sorry, political outcome. I read that as a statement that the amount of water to be recovered for the environment in the Wentworth Group's opinion has slipped away from being based on the best available science but has somehow incorporated a policy position or a political decision rather than a science only decision.

40 MR COSIER: So that goes back to the evidence I gave earlier about the history of the Basin Plan and the Basin Testing Committee so the answer to your question is a very simple yes, that is correct. The reason - - -

45 MR BEASLEY: go on.

MR COSIER: I was just going to say the reason for making the positive statement about the good work was that a lot of work had been done both within CSIRO and

within the Authority itself in setting up the ability to stress-test the volumetric requirements for the various indicators. So it had the potential to deliver the best available science, better than the Guide. But in our opinion – in our strong opinion, as you can tell from the language that we’ve used in those days – that science was not used and it was in fact the use of the science was restricted by the Authority in making the determination about the SDL.

MR BEASLEY: All right. I’m going to just put another couple of quotes from this report to you, then I will take you to parts of both the Guide and the ESLT report to see if I can flesh out that they are the reasons that the group is making these statements at the time. Over on page 2, on the fourth paragraph, the:

The Gillard government went to the Australian people in ’07 and 2010 with a promise to restore the Murray-Darling Basin to a healthy condition. They also promised evidence-based policy based on the best available science.

That’s not just a promise, of course. That’s what the Water Act requires:

There is ample science. What the Authority has done is stop this science being made available and has refused to subject it to transparent independent review so that people can make informed decisions.

Fourth last paragraph, there’s a concern made – a very strong concern pointed out in relation to the setting of a surface water ESLT and what has been done in relation to groundwater. And then over the page, on page 3, fifth last paragraph commencing:

Nobody believes the draft Plan released by the Authority is capable of delivering the reforms needed to create a healthy working Murray-Darling Basin. The current top down selection of infrastructure projects by State Government and agencies are proving to be grossly uneconomic, and the water buyback program, whilst far more effective, is not being undertaken in a strategic manner. It is not surprising that communities are rejecting water reform.

This is bad policy built on flawed 19th century worldview that environmental reform can only be achieved at the expense of the economy. There are no winners in this old-fashioned view. Water reforms should be about providing a future where irrigated agriculture and a myriad of other industries are on a sustainable foundation because our rivers are healthy. All this Plan has done is walk away from the social contract of the National Water Initiative and, in doing so, has given voice to extremists who are hell-bent on destroying water reform for political reasons. We are better than this.

Now, I just want to explore with you, before turning to the rest of this report, what might be some of the reasons or to understand the reasons for those strong views. We know and we have already discussed in evidence with the four of you today that the Guide contained a number of things. It had a chapter, chapter 6, dealing with

environmental watering requirements where it talked about how key environmental assets were determined and what they were. It had a discussion in relation to the need not just for certain amounts of flows, but flows at particular times, at particular durations, and when freshes might be desirable, when overbank flows are desirable, etcetera, etcetera.

And then, when it came to the technical publication of the Guide, it contained a series of tables in relation to what the environmental watering requirements were for various – of the valleys, with different volumes and different times over different periods – percentages of years, etcetera, and ultimately expressed the view, as we have already discussed today at page 114, that the work led to a conclusion or an opinion that 3,856 gegalitres for the – to be recovered for the environment would have a high uncertainty of achieving environmental watering requirements. We have already discussed that term. And 6,983 with a low uncertainty of achieving environmental watering requirements. So all that material and explanation in the Guide is all familiar to you.

MR COSIER: Yes.

MR BEASLEY: And then we come – and I think there's also a discussion in the Guide where they discuss the 106 indicator sites, 18 for key environmental assets, 88, I think, identified for key ecosystem functions and where they talk about flow rates as a percentage of without development flows, 60 to 80 per cent – I think I discussed this before as being a moderate outcome, and anything from 80 per cent and above being a good outcome in terms of achieving environmental outcomes that are considered necessary for the key environmental assets, key ecosystem functions, etcetera. All familiar with that?

MR COSIER: Yes.

MR BEASLEY: Then 11 months later, the ESLT report is published and this, having taken you through the Guide, I think we do need to look specifically at the ESLT report, which is exhibit RCE6. Have you got that in front of you? You might have that in front of you already. So – before I come back to the question, is this why you were expressing the very strong views you have in the January 2012 publication? If I can draw your attention to page (v) of the ESLT report, 'Changes Since the Guide'. Now, bearing in mind, the Guide itself, despite having that 3,865 to 6,983 range, in terms of the modelled scenarios, the Basin Authority chose 3,500 gegalitres and 4,000 gegalitres because they said they had to take into account social and economic considerations. In page (v) of the ESLT report, they talk about the 2010 Guide proposing reductions of between 3,400, 4,000 gegalitres. Of course, being what they chose to model not being the low uncertainty, high uncertainty range that was actually as a result of the data they analysed.

They then say in the paragraph below that they're now using, instead of an end of system flow analysis, an indicator site method which they describe as being much more robust method to determine an ESLT, as it takes into account the specific

ecological targets and flow requirements for indicator sites and opportunities and constraints for environmental water delivery. Now, there's very little else that we've found in terms of published material from the MDBA about the change in their modelling between the Guide and the ESLT report. I'm wondering if any of the four
5 of you have a strong understanding or an understanding of what the difference is between an end of system flow analysis and an indicator site method and whether you have any views about those differences.

10 MR COSIER: So I – I can give you a general comment and Dr Steinfeld can give you the specific answer.

MR BEASLEY: Yes.

15 MR COSIER: The reason for the strong language – I just want to confirm what you were assuming: why the strong language? It may well have been that the draft Basin Plan, the modelling done for the Basin Plan which was possibly better than the Guide, it may well have found a different number would deliver an environmentally sustainable level of take. It might have found it was 5,000 gegalitres, it might have found it was 2,000 gegalitres. Our point, our frustration, our anger was that no one
20 was given the evidence for the conclusions that they draw.

MR BEASLEY: Yes.

25 MR COSIER: The lack of transparency was the reason for the strength of the language. The science should be able to speak for itself and was not allowed to be
- - -

MR BEASLEY: And be tested.

30 MR COSIER: Be tested either internally or in the public domain. But to answer your specific question, we have a specialist in this field who is far more capable of answering your question than I am, I can assure you.

35 MR BEASLEY: All right.

DR STEINFELD: It's Dr Steinfeld here. To my mind, there's many ways to establish an ESLT and we have had two options presented: both the end of system flow approach and the more nuanced hydrological indicator site method. And the key difference in my mind – it's helpful to use an analogy, but looking at the flow of
40 blood through your body, the doctors measure your pulse at your wrist and your – and your neck. They don't measure pulses in your back or your stomach and that's because you get a far more accurate indication of your heart rate by measuring those key points in the system. So if you take that approach to a river system, the end of system flow approach is quite a crude location to be measuring the pulse of a river
45 flow. The hydrological site approach - - -

MR BEASLEY: Sorry, just – I don't mean to interrupt, but I'm going to.

DR STEINFELD: Yes.

MR BEASLEY: When we're talking about an end of system flow analysis, though,
5 my understanding is it's end of system in relation to each valley, not just in relation
to the Murray Mouth, for example.

DR STEINFELD: Yes.

MR BEASLEY: I'm right about that – yes?
10

DR STEINFELD: That's also my understanding, and there's the, I think, 23 valleys
in the Basin.

MR BEASLEY: Yes.
15

DR STEINFELD: They took an end of system measure at each of the end of the
valleys, but, still, valleys can be hundreds of kilometres long - - -

MR BEASLEY: Sure.
20

DR STEINFELD: - - - and flows within that reach can be quite variable, and assets
in one part of the reach might be – have very different flow requirements to another
part. So the – the hydrological indicator site approach allows you to not only move
25 the – choose which particular locations along the reach that you – that were of
interest, but, also, they allowed for greater ability to hone in on the particular aspects
of the flow regime that were important. For example, instead of measuring a fairly
crude measure of 60 to 80 per cent of end of system flows, you could hone in on the
below flows or the overbank flows - - -

MR BEASLEY: Yes.
30

DR STEINFELD: - - - and that's where you start to get the important nuances that
are important for establishing a flow regime.

MR BEASLEY: Thank you. Moving forward in this report and just trying to drill
35 down in relation to your concerns about lack of transparency, can I ask you to turn to
pages 16 and 17 first.

MR COSIER: This is in the - - -
40

MR BEASLEY: ESLT report.

MR COSIER: - - - ESLT report.

MR BEASLEY: So you should have, if you've got – yes, you do have the right
45 page. So 'Framework for Determining an ESLT'. That the heading on page 16
you've got in front of you?

MR COSIER: Yes.

MR BEASLEY: Yes. Okay. So the framework that the MDBA said that they were now using was:

5

(1) establish a set of – a comprehensive set of local environmental objectives and ecological targets that reflect Basin-wide environmental objectives and targets the Basin Plan and the hydrological ecological relationships –

10 etcetera –

(2) incorporates the assessment of the social and economic benefits in cost to changes in water use;

15

(3) to optimise environmental, social and economic outcomes. It provides for the integration of environmental, social and economic considerations at key decision points.

20 And then (4) allows for simulation of ESLT using best contemporary hydrologic modelling. Further down the page, it says:

Further to item 3, some examples of the way that method takes into account the need to optimise economic, social and environmental outcomes are –

25 gives a series of examples, and the second last – third last bullet point is:

Selecting ESLT options for testing that give consideration to economic, social and environmental outcomes.

30 And you will see on the diagram that's given on page 17, there is an arrow after step 6, "Assess environmental outcomes or options", which goes through a box saying:

Iterate if required to meet environmental and socio-economic objectives –

35 which takes you back to step 4:

Select ESLT options for assessments against water requirements –

or potentially even step 3:

40

Determine environmental water requirements.

45 Takes you back down a series of things you're supposed to do. There's a slightly longer explanation of all of this on pages – on page 66 and 67 where, at the top of page 67 – sorry, at the bottom of 66, the report says:

In modelling the ESLT, MDBA had to take account of social and economic implications in the following ways.

5 It's got four bullet points about how they've done that, and then says in the paragraph after the first bullet point on 67:

10 *Following the significant analysis to quantify the lower bound of ESLT set out in this report, the judgment to choose the bottom end of the band of environmental restoration needs is simultaneously to maximise the productive benefits from water use and to minimise social and economic impacts from reductions in water availability for irrigation, industry and other water users.*

15 We know that after all that process, set out on page 69, ultimately, a basin-wide reductions in diversions of 2,800 gigalitres was selected and that, ultimately, became the 2,750. Having drawn all that to your attention, the questions I have are these: is whether you, any of you, are aware either through anything published by the Basin Authority or any discussions you've had with anyone at the MDBA in relation to the 2,750 gigalitres, what volume of that is attributable to an iteration required to meet an environmental and – sorry, required to meet a socio-economic objective.?

20

MR COSIER: No, not the faintest idea.

25 MR BEASLEY: Do you have any understanding of what the socio-economic objectives might be for anything published by the MDBA or in discussions with the MDBA?

MR COSIER: Well, a cynic would suggest it was to maximise your chance of getting the Basin Plan through Parliament.

30 THE COMMISSIONER: Could I just ask, just take it step by step, please, all of you feel free to comment on this. It's a mixture of legal policy and scientific matters I'm asking about. Environmentally sustainable level of take which must be reflected in the sustainable diversion limit is expressed, isn't it, in terms of long-term averages, yes?

35

ASSOC PROF PITTOCK: Yes, it has been expressed in that way.

THE COMMISSIONER: As are SDLs themselves.

40 ASSOC PROF PITTOCK: Yes, it has been expressed in that way.

45 THE COMMISSIONER: So that they are expressed as a single figure, but, in a sense, the numerical content of that figure is a kind of convention. It tells you this is a long-term average in any one year or season. It will be a sheer fluke if allocation experience actually results in that figure being achieved.

ASSOC PROF PITTOCK: Yes, that's a largely unstated convention associated with that language.

5 THE COMMISSIONER: And perfectly sensible, I would have thought, if only to make an already prolix statute less long-winded than it might otherwise be.

ASSOC PROF PITTOCK: Yes.

10 MR COSIER: Peter Cosier here. It's also a convenient way of establishing the property right to the use of water.

THE COMMISSIONER: Hence, your measure.

15 MR COSIER: Well, as – but as Professor Pittock said earlier today, it establishes the property right as to who owns what proportion of the resource, then other processes on an annualised basis determine the actual allocation of water from that property.

20 THE COMMISSIONER: The capacity to enjoy that right, yes, in kind.

MR COSIER: Yes. Yes.

25 THE COMMISSIONER: Yes. Now, why I'm asking is that single figures are used, 2,800, 2,750, 3,200, etcetera.

ASSOC PROF PITTOCK: Indeed.

30 THE COMMISSIONER: And it's the MDBA and, in fact, ministers who, from time to time, have talked about single figures, correctly using the convention which treats that single figure as a way of rendering, not only the long-term average nature, but also the fact that it's the starting point for considering things such as private rights.

ASSOC PROF PITTOCK: Quite.

35 THE COMMISSIONER: Being a single figure is a necessity for the framing and expression of the statute and its administration; is that correct?

MR COSIER: Yes.

40 THE COMMISSIONER: But it has nothing to do with a pretence that somebody with iterative titration has come up with a precise figure. That's absurd, isn't it, in the nature of this river and these conditions?

45 ASSOC PROF PITTOCK: Yes, absolutely.

THE COMMISSIONER: We're not measuring by tablespoons here or teaspoons.

ASSOC PROF PITTOCK: No, there's a degree of – Associate Professor Pittock here. There's a degree of error in all of these calculations and assumptions, even if they were done to the highest scientific rigour.

5 THE COMMISSIONER: I'm labouring the point a bit, but there's a reason for it. Figures that end in a zero, particularly figures that end in a double – two zeros announce to the world that precision is no part of the exercise. These are estimates, approximations, rounded up decimally because we are a species with five digits on two hands.

10 MR COSIER: Peter Cosier here. That, in itself, is not necessarily an inappropriate thing - - -

THE COMMISSIONER: No, no, no, it seems to me to be - - -

15 MR COSIER: - - - if it was based on the science - - -

THE COMMISSIONER: - - - socially, scientifically culturally necessary, otherwise you will go mad and, more to the point, you will never finish, because if you chase precision it means that you're going to change things probably by the minute.

MR COSIER: You are also pretending you know something to a level of precision when you actually don't.

25 THE COMMISSIONER: Exactly. I'm sorry for labouring this point about a single figure because it has never occurred to me that anyone in their right mind could think that a single figure described a scientifically precise measure with a meter, as it were. They are for administrative purposes based on the science and essentially in the nature of approximate estimates. Have I grasped correctly how your disciplines use
30 these figures?

ASSOC PROF PITTOCK: Yes, I think that is expressed very well.

THE COMMISSIONER: Yes? All of you?

35 DR STEINFELD: Yes.

PROF THOM: Yes.

40 MR COSIER: Mr Commissioner, the other observation Peter Cosier would make from Mr Beasley's quotes is that our interpretation of that report and the quotes that you referred to, bear little resemblance to how we understand the definition of an ESLT under the Water Act.

45 THE COMMISSIONER: Yes, I understand that. In the diagram of decision-making on page 17 of RCE6, the ESLT report, figure 2.1, there's a prompt to iterate if required to meet environmental and socio-economic objectives. Now, I just want

you to assume that I regard environmental objectives as those that you find in the definition of environmental impacts - - -

MR BEASLEY: Environmentally sustainable level of take.

5

THE COMMISSIONER: Environmentally sustainable level of take in the statute. I don't want you to assume anything about what I think socio-economic objectives are because they are not actually specified in the statute except that there has to be an optimisation of outcomes which are socio and economic. I'm interested in this idea of iterating if required. I'm used to the notion of what I might call a provisional testing of something. It happens not only in hard science but in social sciences as well. We, as it were, eyeball a problem and you think such and such a variable might produce something that is desirable. You try it. You run it through your models or your algorithms or your analysis and you find it misses by too much to be comfortable so you tweak it and you put in a different value for the same variable.

That's a very familiar way of human reasoning. It has actually produced an expression "trial and error". I don't quite understand at the moment what it means to iterate if required to meet objectives without having had those objectives stated beforehand, otherwise you're not testing anything. Can any of you explain to me what that might mean, except Mr Cosier, he has already said he can't?

DR STEINFELD: Can I provide a little bit of insight in the objectives that you're talking about in the model sense, the 122 flow indicators.

25

THE COMMISSIONER: Yes, that's for the environmental ones.

DR STEINFELD: For the environmental ones, correct. Yes.

THE COMMISSIONER: So they are either met or not.

30

DR STEINFELD: Yes.

THE COMMISSIONER: By reference to their criteria for satisfaction, which will be, say, over the banks by a particular amount at a particular time of the year for a particular duration, once in a blue moon or whatever the tests has been beforehand. That won't include anything to do with the domestic product generated on farms.

35

DR STEINFELD: No, that's correct. And - - -

40

THE COMMISSIONER: So you wouldn't iterate it - - -

DR STEINFELD: No.

THE COMMISSIONER: - - - if it was met.

45

DR STEINFELD: Yes, that's correct. I guess the modelling scenarios that were iterated over were a very narrow range of the full range of watering options available. So - - -

5 THE COMMISSIONER: What do you mean by a very narrow range, 24 to 32?

DR STEINFELD: So if we look at what was proposed in the Guide, the full range was between 3,000 and say 7,600. To me there should be no reason why scenarios across that full range were not iterated within - - -

10

THE COMMISSIONER: What I don't understand is what it means to reiterate if required to meet socio-economic objectives. I'm totally lost to understand what that means.

15 DR STEINFELD: I can't help you with that.

ASSOC PROF PITTOCK: The academic approach in our disciplines to this is known as adaptive management and that's not some sort of ad hoc trial and error process. It's a process whereby a researcher or a manager must define a hypothesis and identify some indicators and test against them and if they're not achieved to a satisfactory state, change the approach and document and do that transparently so that it's a defined program of learning. What we don't see with what the authority has provided us here is that professional adaptive management approach because, as you say, the socio-economic objectives are not defined, because it's not a transparent documented process.

20

25

THE COMMISSIONER: So that really means it's at a fundamental level of what I call the scientific method or scientific reasoning that figure 2.1 represents a methodological failure.

30

ASSOC PROF PITTOCK: Yes, that's my view.

THE COMMISSIONER: Does anyone disagree with that? Thanks.

35 MR BEASLEY: Can I just ask Dr Steinfeld this, and this isn't me being pedantic, I just want to make sure I'm not making an error. You've been referring to 122 indicator sites. I've been referring to 106. It could be I'm wrong. I thought there was 18 for key environmental assets mentioned in the Guide and 88 for key ecosystem functions. Is there - I'm missing 16 somewhere, am I?

40

DR STEINFELD: No, that's correct but the number of indicators that were used in subsequent modelling in the ESLT that informed the Basin Plan increased and perhaps changed as well but I haven't done a comparison.

45 THE COMMISSIONER: Happily, you may both be right.

MR BEASLEY: I might be right for the Guide.

DR STEINFELD: You are.

MR BEASLEY: But I'm just wondering whether I'm wrong if I say that for the
ESLT report, am I?

5

DR STEINFELD: That's my understanding, the ESLT was 122.

MR BEASLEY: Okay. All right. Thanks for that, I will make sure I get that right
next time. Add it to the list of errors I've made. Still on the fingers of one hand. I
10 just go back to this – that was a joke.

MR COSIER: That's why I laughed.

MR BEASLEY: Don't worry, I'm keeping a tally of everyone's errors. Not the
15 witnesses. If I can go back on the iteration box, if I can call it that, that the
Commissioner was taking you through and I guess the answer to this is obvious but
Mr Cosier gave the answer to which everyone agreed, but none of you understand, at
least in terms of a volume of water, what part of 2,750 is made up from some either, I
suppose it could be a reduction or an addition as a result of the socio-economic
20 objective, whatever they are. But I assume the answer would be the same if I asked
is there anything you have seen published by the MDBA or anything you've been
made aware of in a discussion with someone from the MDBA, is whether 2,750
factored in benefits to the environment from environmental water – economic
benefits and social benefits from environmental watering.

25

ASSOC PROF PITTOCK: Associate Professor Pittock here. There was quite some
criticism of the draft Basin Plan that only the negative costs to consumptive users
had been considered, and as a result of that, Mr Tony Webster was appointed to the
Murray-Darling Basin Authority to oversee in part a process of trying to document
30 the ecosystem service benefits from different reallocation of water to the
environment. So there was a crash program, I believe, that has been referred to by
Dr Colloff in earlier evidence to try and do that. That was a positive move in our
disciplines. Ecosystem services, is a very well-defined concept that refers to the
benefits that people obtain from the environment. And it's codified in a series of
35 categories to force decision-makers to systematically work through the different
benefits you can obtain by the environment.

So for example, the cultural benefits that indigenous communities might get from the
environment are identified. So the benefits of having a restored floodplain in terms
40 of holding peak flood waters and avoiding flood damage are quantified so that the
benefits of fisheries are quantified to force decision-makers to take the full range of
benefits into account. So that crash program was undertaken but it was, as I recall,
contracted out by the Authority. I don't recall who the main consultant holder was. I
did attend the key workshop to develop that but the point was made at the time that
45 there was too little time left to undertake that assessment rigorously to ensure that all
of those different values were quantified in each category before the final Basin Plan
was - - -

MR BEASLEY: Too little time left before the Basin Plan had to be finalised. Of course that was six years ago.

ASSOC PROF PITTOCK: Yes.

5

MR BEASLEY: The reason I'm asking you that question is that, as we've discussed, the Guide mentions this range, 3,856 high uncertainty, 6,983 or whatever it is low uncertainty. But then says we are only going to model 3,000, 3,500 and 4,000 because we are now taking into account social and economic outcomes which tends to indicate that what is being considered is something that is negative and depresses the amount of water required for the environment or increases the SDL whereas there doesn't seem to have been in any part of that or the 2,750 an analysis of what might be an economic benefit from watering.

10

MR COSIER: Peter Cosier here. Just to be a little fair on the question, as Associate Professor Pittock said, the concept of benefits and ecosystem services that are provided by environmental assets is a well-established concept. Often assigning a benefit to an asset condition is not so easy. And if you try and run the matrix, you end up with a brain explosion, usually. So one of the ways of dealing with that complexity has been done through both – through the Guide process. And that is the implied benefits from targets for the different indicator types. So the obvious is a target to remove two million tonnes of salt from the river. It is an implied benefit in that target. From that target, you then set volumetric requirements for the indicator. So I do think it's not reasonable to suggest that the concept of benefits hasn't been incorporated into the process but it is more by an implication than an overt process as Professor Pittock was describing.

20

25

THE COMMISSIONER: Could I just go back to a couple of things you were saying including that last answer. This is for all of you. Is it possible to view what the MDBA did in setting an ESLT in this fashion, that they used science to establish targets or thresholds or tests. Nowadays in a slightly different context, they might be called environmental watering requirements. They come up with a range described according to varying degrees of confidence or risk in the achievement of success in meeting those, which at the moment I will just call 3,800 to 7,000 just for convenience. And the lowest – the lower end of the range I will ask you to assume the MDBA would regard as a recovery for the environment, at which and above which there would not be a compromise of the environmental matters referred to in the definition.

30

35

In shorthand, there would not be a compromise of the environmental values. And then the MDBA says having called the lower end of the range, which happens to be the higher level of uncertainty of achievement, having called that a level at which there will not be compromised environmental values we the MDBA are then obliged under the statute to maximise social and economic benefits – outcomes. And we treat, by and large, reduction of consumptive uses, reduction of irrigation and we equate that with, in net terms, social and economic detriment.

45

And then, so we say, we the MDBA then says, I obey the statute by finding because reduction in consumptive use is a social and economic detriment, by finding the lowest return to the environment that will not compromise the environmental values and I'm required to set that as my ESLT because otherwise I won't be maximising the avoidance of detriment which is benefit socially and economically. Is that a kind of reasoning that you perceive in their approach?

MR COSIER: Yes.

10 ASSOC PROF PITTOCK: Yes. And - - -

THE COMMISSIONER: I'm not asking whether it makes sense because I'm going to ask a few more things. I'm trying to read between the lines of these passages, which are difficult passages, aren't they?

15

MR COSIER: And it's not unreasonable reasoning. So if - - -

THE COMMISSIONER: Well, it has a fallacy in it. Can I just raise this for your consideration before you answer that question? It seems to me to have a fallacy that you have come up with a lower end of the range which you have defined by saying what's the lowest I go while having a high level of uncertainty before the level of uncertainty becomes higher than high. So, in effect, you say the lowest I can go before environmental recovery is at what I'm going to call a high level of uncertainty of achievement of environmental outcomes, that is, not compromising values.

25

And this morning I asked you about what you thought that might mean and I think it means that you don't think it will be achieved if you have a high level of uncertainty, that will be achieved. That seems to me to be a fallacy because at that point then I would have thought by definition you are compromising the environmental value. If you don't think that they will be protected, it means that you are compromising, I would have thought.

30

MR COSIER: Yes, and so that's where I was going, too. So it's the risk that you assign to the lower value that makes or breaks that concept.

35

THE COMMISSIONER: Yes. Because of the word "compromise" in the definition.

MR COSIER: Yes.

40

THE COMMISSIONER: And ESD and the precautionary principle and the less science you do or the less science you have or the less science you expose to professional scrutiny or even, God forbid, community consultation, then the more doubts you would have and, therefore, the more prudent you would need to be in the amount of recovery.

45

MR COSIER: Yes.

THE COMMISSIONER: I think that's how ESD works, isn't it?

ASSOC PROF PITTOCK: Yes, that's certainly my view but I would also say that the Authority went below that threshold that you were talking about, in that the
5 CSIRO review of the ESLT in assessing against 112 of the targets reported that 20 would not be improved and 36 would not meet the Authority's target so - - -

THE COMMISSIONER: That was for 28, wasn't it?

10 ASSOC PROF PITTOCK: Yes. So they undershot that minimum level that you're talking about.

THE COMMISSIONER: Well, to put it another way, which is the statutory way, almost by definition those are numbers which show compromise of the
15 environmental values.

ASSOC PROF PITTOCK: Yes.

PROF THOM: Commissioner, in looking again at the Water Act in section 22 and
20 in the table there that's on page 40, number 3, the question of identification of risk to the condition or continued availability of Basin water resources setting out A, B, C and D, the point that we're making here is by going to that high level of uncertainty they're adding substantially to those risks but they are not documenting those risks. If they had taken the modelling at the other end of the scale and compared the two,
25 so taking the modelling at 7,000 rather than 3,000 or whatever, we would have seen a lot clearer what the level of risks were associated with the use of lower versus higher.

And what I'm concerned about is that we're not seeing a clear definition in this compromising process of what those risks now are. Noting, of course, under (b) we
30 have got the effects of climate change which, of course, they ignore completely. So the point that I'm making is that by going to this lower level to reach these compromising, then they are entrenching more loss of water to the environment. They're heading in that direction at all times.

35 THE COMMISSIONER: Now, let me be clear. You've just used the word compromising in a way that is not in my view, the way the statute uses it. You've used it perfectly well with respect as a matter of English, that is the MDBA seems to
- - -

40 PROF THOM: I try to use good English.

THE COMMISSIONER: They seem to be using it as an approach of compromising between environmental outcomes and socio-economic outcomes. I have expressed a provisional view, nobody has yet condescended to tell me why it's wrong, that the
45 word "compromise" in the definition of ESLT in the statute has nothing to do with such a compromise. That is a give and take. It's an entirely different use of the word "compromise" as in being placed in a compromising position; that is, a position that

in some sense endangers or imperils you. In a statute which talks about ESD, it's fairly clear that a precautionary principle is in the same area of discourse, unknowns are to be guarded against by buffers rather than risks. Now, item 3 in section 22 is a stipulation of the mandatory content of the Basin Plan. It's one which has much of my red marking on it, on my copy.

MR COSIER: Yes.

THE COMMISSIONER: I have looked and failed to find in the Basin Plan any substantive that is real compliance with item 3. Have any of you?

PROF THOM: That's why I drew it to your attention.

THE COMMISSIONER: That's what I gathered, you can't find it either.

PROF THOM: That's my understanding. My colleagues may tell me if I'm wrong. That's my understanding because I pointed to that straightaway. When I looked at that, I could see in the light of this discussion where we were heading with respect to item 3.

THE COMMISSIONER: What do you understand by the expression "the availability of Basin water resources"? I wondered at times whether – is that just talking about availability for consumptive use or is it talking about what might in another context be termed sustainability.

PROF THOM: To be generous to the Authority in this case, I would assume they're talking about water resources for consumptive as well as environmental purposes.

THE COMMISSIONER: As well as?

PROF THOM: As well as. Because I think they would be required to look at that in the context of both consumptive as well as environmental. But I'm thinking in terms of the application by using that high uncertainty figure that we're talking about, they are then exposing themselves to the risks under item 3.

THE COMMISSIONER: I've assumed that availability must include for the environment because paragraph (a) of the specific requirements for item 3 in section 22 is the taking and use of water, which is consumptive. So it must be talking about something greater than that, if you're talking about that affecting that availability. That would be for the environment. So all of that means, doesn't it, that - - -

ASSOC PROF PITTOCK: Commissioner, I agree with you that the risks are not well-defined in the Basin Plan. If I can be kind to the Authority, I think they would argue that inflow interception activities are somehow incorporated in the cap on water entitlements. Now, I don't believe that that is adequately operationalised but nonetheless if they were to argue that it is regulated. In terms of 3 part (b), the effects of climate change, four of the Authority's staff, led by Ian Neve, have

published an academic paper in the Journal of the Australian Water Association in 2015 which sets out their view, the Authority's view, on how they believe the risks of climate change are taken into account through the Basin Plan.

5 MR BEASLEY: It's incorporated in the Environmental Watering Plan.

ASSOC PROF PITTOCK: Yes.

MR BEASLEY: For example, section 8.04;

10

The overall environmental objectives for the water-dependent ecosystems of the Basin are within the context of the working Murray-Darling Basin (c) to ensure that water-dependent ecosystems are resilient to climate change and other risks and threats.

15

ASSOC PROF PITTOCK: Now, I and other academic colleagues argue that that is a very poor attempt to manage the climate change impacts.

MR BEASLEY: It may be meaningless if you don't incorporate climate change projections into your SDL. Otherwise it's just a statement of - - -

20

ASSOC PROF PITTOCK: There are also a range of no and low regrets adaptation measures that the authority could have chosen to give effect to in this iteration of the Basin Plan that they have not.

25

THE COMMISSIONER: Well, now, just to complete this, and again this is for all of you. In the Basin Plan, part 2 starting at section 4.02 – that part 2 of chapter 4 starting with section 4.02 is the only place I've found item 3 in the section 22 table satisfied. And why I said earlier that it didn't seem to be substantive or real is that it's not much more than a paraphrase with a little bit of elaboration of the statute. I'm still slightly taken aback that somebody would have thought it worthwhile of printers ink to say that one of the risks is that insufficient water will be available. I mean that is the premise of the Water Act.

30

MR BEASLEY: You mean it didn't need to be said that it mightn't rain?

35

THE COMMISSIONER: Well, it doesn't seem to be informing anybody about risk. Then in strategies to manage the risks, I'm again slightly taken aback that taxpayer's money have been devoted to paragraph 4.033(b) and (c) which is:

40

to develop plans, etcetera, based on best available knowledge and in consultation with the relevant stakeholders and to promote a risk-based approach to water resource planning and management.

45 Which I would have thought the type of response by any taxpayer would be quite so, I thought that's what you were doing. So it seems that in the course of under the statute doing just that, they have said a way of dealing with the risk of not being right

is that they will do just that, which I have to say, I mean, it borders on the insolent, I would have thought, in terms of official conduct.

5 ASSOC PROF PITTOCK: Indeed. Commissioner, there are a number of very active risks that are conceivable that we would have anticipated would have been considered in this plan. To give you a couple of examples - - -

THE COMMISSIONER: Continuous audit might be one strategy to deal with it.

10 ASSOC PROF PITTOCK: Indeed. But there are also a number of emerging industries like for example unconventional gas extraction in the northern part of the Basin that have very serious implications for water use and I would have expected to see a number of those kinds of changes in water use reflected in the plan.

15 THE COMMISSIONER: Well, now, if the strategies include, as they say in 4.033(h)(2):

The improvement of knowledge of the impact on Basin water resources of floodplain harvesting –

20

the question is raised, has that strategy been implemented?

MR COSIER: Well, our answer obviously is not with the abolition of the Sustainable Rivers Audit. It can't possibly be.

25

THE COMMISSIONER: Do any of you know what is being done to improve knowledge of the impact on Basin water resources of floodplain harvesting?

30 DR STEINFELD: We recently submitted a submission to the New South Wales Government on their water reform action plan and within that submission we outlined our concerns with their proposed approach to managing floodplain harvesting entitlements and a lot of that was around the considerable uncertainty about how much water is being taken through floodplain harvesting as well as the issues of works on floodplains and the problems with ensuring works are licensed works on floodplains.

35

40 Given previous work that I have done and published has been around looking at how many structures are in floodplains that can potentially capture water from floodplain harvesting and I found, in Macquarie alone, hundreds and hundreds of kilometres of floodplain works, and some of those were within the floodplain boundaries. So the floodplain harvesting issue is huge. There's still science being done on actually working out how much water is being taken through floodplain harvesting in - - -

45 THE COMMISSIONER: Who is doing that?

DR STEINFELD: There's recently been some work by the UNSW Centre for Ecosystem Science, so Richard Kingsford is leading that work.

THE COMMISSIONER: And does the MDBA do work of its own notion in this regard?

5 DR STEINFELD: I haven't seen work published by the MDBA on floodplain harvesting. A lot of the issue of floodplain harvesting is left to the states to manage and - - -

10 THE COMMISSIONER: Now, why is that? Because I'm looking at section 172 of the Authority's functions in the Act which seems to include, in very considerable detail, actual functions which would definitely include the improvement of the knowledge of the impact on Basin water resources of floodplain harvesting. I won't read it all, but there's lots of it.

15 PROF THOM: I'm also at the same page, Commissioner.

THE COMMISSIONER: Yes.

PROF THOM: I note:

20 *To measure, monitor and record the condition of water dependent ecosystems associated with Basin water resources.*

THE COMMISSIONER: Quite. Quite.

25 PROF THOM: On page 165(c).

THE COMMISSIONER: Exactly, and:

30 *The taking of water from the Basin water resources and interception activity*
- - -

DR STEINFELD: Yes.

35 THE COMMISSIONER:

- - - *and to support, encourage and conduct –*

and I stress conduct –

40 *research and investigation about the Basin water resources.*

Have I missed something? Has the MDBA been deprived of funds to conduct research or what? I don't understand how you can identify a risk, identify a strategy, have the function, among other things, of carrying out the research which is part of
45 that strategy and not carry it out. I'm asked, amongst other things, to opine on whether this is a plan which will be achieved, to use what to me now is an obnoxious slogan, "in full and on time". I don't know what "in full" means, and "on time" is,

plainly, pie in the sky. So – but I don't understand how you can possibly set about that without carrying out research.

5 PROF THOM: Commissioner, I'm not sure that I have the answer; my colleagues
may. Once – one thing I would contemplate here would be that some of these
functions have been delegated to the states, and the states in various capacities are
undertaking some of these functions. This particularly applies when you look at the
powers to enter land and other compliance, but when you look at the compliance
10 issues that come under division 2 and section 219, we were concerned about that in
relationship to the problems facing New South Wales in the northern Basin which
came up on the Four Corners program. The compliance powers that are written into
the Act, as well as what you're describing here under the Authority's functions,
they're very clearly articulated, extremely detailed, and yet, we do not see that the –
15 that the Authority has sought to exercise those powers in the – in the detail that
they're outlined in the – in the Water Act and I think that has been a concern to us,
particularly following the revelations that came out of that Four Corners program.

MR BEASLEY: In fairness to the Authority, don't those powers only kick in,
20 though, once water resource plans are accredited or are you talking about something
else?

PROF THOM: That – that – that is true.

MR BEASLEY: Yes.
25

PROF THOM: However, the – the concern we - - -

MR BEASLEY: I'm not suggesting that means they can't do anything, but - - -

30 PROF THOM: That – that's right and the concern we have is that – whether they
will be resourced to be able to undertake those powers. That – I think my point
being here that it's great to have the powers clearly articulated as they are, but unless
the government provides the resources to the Authority in order to undertake those
powers, we have got a problem. And, to me, the benefits of the Act as articulated are
35 clear for the – for the Authority as the central Authority exercising those powers
across state boundaries is – is very, very important and very, very important to be
implemented and not to allow things to, sort of, drift on as they may appear to be
drifting on at the present time.

40 THE COMMISSIONER: Well, it's a cooperative interstate exercise; hence, South
Australia's interest in the matter. In subsection 172(2)(c) - - -

ASSOC PROF PITTOCK: Commissioner, may I comment on that before you move
45 onto another matter.

THE COMMISSIONER: Absolutely. Yes.

ASSOC PROF PITTOCK: Associate Professor Pittock. Certainly, the Authority's resources to undertake research into these areas have been limited, and Mr Cosier earlier referred to New South Wales withdrawing its funding for the so-called shared programs. A lot of the research that the Authority had previously undertaken in the areas of natural resources management were funded jointly by the states, and a lot of that joint funding was withdrawn at that time, and so a lot of that research did not continue. It coincided with the loss of a lot of Federal funding for water resources, knowledge and research, for example, the closure of the National Water Commission which provided a key role in generating some of the knowledge needed for these – these elements.

There are a number of risks here that are of quite some concern. So, for example, inflow interception associated with revegetation in the catchments. Researchers like Natasha Herron and Richard Davis have looked at, for example, the implications of planting 10 per cent of upper catchment of the Macquarie River which would lead to something like a 17 per cent loss in their modelling of surface water resources. And so then, obviously, then has implications for things like carbon farming, funding by the Federal Government, revegetation programs that need to be managed. Now, in my view, that sort of risk has not been clearly managed and should be through that sort of investment in research.

THE COMMISSIONER: I think it links in with paragraph 172(2)(c) of the Act. I don't know why there's no (b), but - - -

MR BEASLEY: Yes, I noticed that.

THE COMMISSIONER:

Authorises the Authority to request a Basin state to carry out any measuring, monitoring or recording within the state's geographical limits that the Authority considers necessary.

So there's no doubt that measuring, monitoring and recording floodplain harvesting is something which is within the Authority's functions and powers to request, say, New South Wales to carry out. Now, it's a different question, which may have its own constitutional dimensions, as to what happens if New South Wales says, "In your dreams." But the power to ask is clear, and that's why I was asking, I'm not aware of the MDBA having done anything in relation to the study of floodplain harvesting, and I don't want to be unfair to them, but all I can look at is what is within my grasp and most of which is in the public arena.

DR STEINFELD: It's Dr Steinfeld here. There's two ways that they have considered it so far. The first way is in establishing the SDLs through their modelling. So they – the Authority had to make some sort of estimate of how much water was being diverted. Whether or not that estimate is accurate, we're not sure. And the second way that those floodplain harvesting diversions are being incorporated is through the ongoing compliance and cap reporting. So within the

diversion limits, within each valley, the Authority needs to be confident that states – within the overall SDL for that valley and that includes diversions from floodplain harvesting, my understanding is that they are relying on the states to be able to provide that accurate information to the Authority.

5

THE COMMISSIONER: Should I understand from that, that the SDL for a particular area, you believe included, at least, some consideration to the possibility of floodplain harvesting having occurred.

10 MR BEASLEY: As part of estimating what the baseline diversion was; correct?

DR STEINFELD: Correct. I don't know how accurate it is.

MR BEASLEY: No, no, that's a different issue.

15

DR STEINFELD: Yes, but they - - -

THE COMMISSIONER: I don't think anybody does and - - -

20 DR STEINFELD: They did - - -

MR BEASLEY: I can't remember the figure. There is a figure where there was an overall Basin-wide estimate for how much was being diverted because of floodplain harvesting. I just can't recall the figure or where I read it at the moment.

25

THE COMMISSIONER: Then, as I understand it, you – let's use the word cap. The enforcement of the cap or observed compliance with the cap would require an understanding, not just of what's being pumped, but of what's being harvested on the floodplain; is that right?

30

DR STEINFELD: I would have to check the definition of cap. I know, certainly, that that is required post 2019 when the SDLs come into place, but I'm not sure about the transitional requirements and whether floodplain diversion limits are required.

35

THE COMMISSIONER: What I'm really unsure about - - -

DR STEINFELD: Yes.

40 THE COMMISSIONER: - - - and can't find in the material, is any genuine measurement for the first of those exercises and any monitoring at all for the second of the exercises.

45 DR STEINFELD: I haven't seen anything published on the documentation of evidence behind how much floodplain - - -

THE COMMISSIONER: As I understand it, it's a matter of, I think, public record how much is pumped. There's a few details about what can be disclosed, but it is – actual amounts is very precisely published data, but I've not seen that for floodplain harvesting.

5

MR BEASLEY: No.

THE COMMISSIONER: Now, I realise this is not so straightforward to metre, so to speak, but it doesn't mean it can't be the objective fairly robust quantity of estimate, and I'm not aware of anything done. Have I missed something?

10

DR STEINFELD: I'm not aware of any research been done by the MDBA on floodplain harvesting.

THE COMMISSIONER: Which really means they have identified a risk, they have identified a strategy, they have got a function and a power to implement the strategy and they have done nothing. You don't have to agree with that. It may be a rhetorical flourish on my part, but I, at the moment, don't seem to be able to find anything to supply an answer to that. If any of you four know of anything to the contrary, I would simply ask time for me to be given a clue to where to find it.

15
20

PROF THOM: Commissioner, can I add something further with respect to the relationship with the states.

THE COMMISSIONER: Yes, please.

25

PROF THOM: You referenced 2(c). The word there is "request" and, of course, that - - -

THE COMMISSIONER: Yes.

30

PROF THOM: - - - doesn't mean a state needs to do anything.

THE COMMISSIONER: Not in itself, it doesn't, no.

35

PROF THOM: And – and that was important in its own right, particularly if the Authority doesn't have the resources, and that's technical resources as well as financial resources to undertake that. I'm also conscious of this in relationship to section 21(3)(b) – sorry, 21(3)(a) and (b) in relationship to the wise use of Basin water resources and that in relationship to the Ramsar wetlands. Now, we have, and I think you have on record, the Commonwealth at the moment delegates to the states the monitoring of what is happening within the wetlands.

40

THE COMMISSIONER: Yes.

45

PROF THOM: And you probably have before you the Auditor-General of Victoria's report on what the Victorian authorities, parts of Victoria as well as

Metropolitan Water have been doing or not doing in relation to that delegated responsibility, and the Auditor-General of Victoria clearly made the point that there was a lot not being done. But, yet, the Commonwealth gave it a tick and didn't do anything about that and didn't seem to want to do anything about the negative
5 response that came through the Auditor-General. My concern is that the Commonwealth, really, is not positioning itself rigorously and vigorously to be able to monitor the activities that the states are doing, both through the Commonwealth Department of Environment and Energy which has got the powers with respect to the Ramsar, as well as the Authority with its particular powers. And I think this is
10 something that, when we're talking about long-term, the words have come up within the – within the Act, this long-term – these long-term issues, there needs to be a far more powerful auditing process that takes on the responsibilities that the Commonwealth has under this legislation.

15 MR BEASLEY: Do you mind, before I go back to if I just finish, given you raised floodplain harvesting, just finishing questions on that?

THE COMMISSIONER: No, no, please.

20 MR BEASLEY: Thanks. Floodplain harvesting is – there's no criticism of this, but it's not the main part of your submission, but you do mention it on page 14 of the submission you've filed with us which has now got an exhibit number RCE73 and a red dot. So on page 4, you – 14, I'm sorry, of your submission, you mention:

25 *Key issue 2, progress on implementing the plan.*

I think you've missed out the word "Plan", that's why I read it "implementing the Murray-Darling Basin" adding the word "Plan", and you've identified a number of risks to the implementation of the Basin Plan, "In full and on time".
30

(3) risk that environmental flows could fail to reach target locations because they are being undermined by state water management rules.

And I think Dr Steinfeld gave the example of the Barwon-Darling Water Sharing Plan as one of those rules where there could be an environmental flow, but if it's at –
35 that might take a flow above the amount of flow that enables pumping under a class A licence for example, and then you say:

40 *... and constrained by development on floodplains.*

That's obviously in relation to – I'm right, am I, that that's where you're talking about floodplain harvesting?

45 DR STEINFELD: There's a couple of issues. Floodplain harvesting is one of them
- - -

MR BEASLEY: Yes.

DR STEINFELD: - - - as well as other constraints issue that Jamie mentioned before.

5 MR BEASLEY: Right. All right. But just dealing with floodplain harvesting, just so I understand why it's important. First of all, you mentioned you'd recently done a – the Wentworth Group has recently published or provided a submission to the New South Wales Government in relation to proposed changes to its policy and rules regarding floodplain harvesting. Yes. Is that submission on your website?

10 DR STEINFELD: I will have to check. I don't think it is at the moment.

MR BEASLEY: All right. Would we be able to have a copy if it's not?

15 DR STEINFELD: Yes.

MR BEASLEY: Thank you, and in terms of why knowing something about floodplain harvesting is important, first of all, it's important to know how much water is being intercepted on a floodplain for a start; correct? Because, otherwise, you don't know how much water is being prevented from going back into the water resources, the water system, the river system; correct? And if you don't know that, then you won't have an accurate figure for a base line diversion limit in any particular valley or floor, Basin-wide, correct?

20 DR STEINFELD: Correct.

25 MR BEASLEY: All right. Which then has an impact, particularly, if you're taking into account social and economic factors in terms of setting an ESLT reflected in a SDL, but even beside that, it will affect the accuracy of that process; correct?

30 DR STEINFELD: Correct.

MR BEASLEY: Yes. Okay.

35 THE COMMISSIONER: Just one more thing about - - -

MR BEASLEY: Is there anything further you want to go on that?

40 THE COMMISSIONER: Yes, floodplain harvesting. It takes a number of different forms, hydraulically, logistically, but one of the forms it takes is keeping saturated or inundated land which would not otherwise be in that state or, at least, not for such a long period. Am I correct in understanding that that is something that may, depending upon degree, I assume, have environmental or ecological consequences?

45 DR STEINFELD: Yes, I have documented those consequences of structures like levee banks, ponding water on floodplains for periods that are longer than the natural – within the natural range, and the most obvious example is off-river storages that, within them, there has been, you know, Red Gums that are growing, but the water that

has been permanently maintained in off-river storages has killed – killed all the Red Gums. So it's very clear that too much water can also be a problem, not only for that community, but also the implications of those structures downstream, and the configuration of the structures on the floodplains can have very different effects on the passage of flows. In some circumstances, the banks can retain the flows, and other circumstances, the banks can constraint and accelerate flows leading to a floodplain. It's really important to understand the local context and the geomorphology of the landscape to understand how the flows will impact vegetation.

10 THE COMMISSIONER: So I take it - - -

ASSOC PROF PITTOCK: Associate Professor Pittock here.

15 THE COMMISSIONER: Yes.

ASSOC PROF PITTOCK: I note that, very much the same, environmental impacts also accrue to many of the environmental works and measures on floodplains for the living Murray projects and and some of those that are now proposed for the sustainable diversion limit projects.

20 THE COMMISSIONER: So there's the artificiality can lead to unnatural volumes, locations and durations of inundation and saturation to the detriment of the natural fauna and flora biodiversity.

25 ASSOC PROF PITTOCK: Yes.

30 THE COMMISSIONER: It occurs to me as well that one thing about floodplain harvesting is that a lot of it takes the form of what are called ponding of water that would otherwise spread, soak in, evaporate, transpire, run off. And one thing about ponding is that it may prevent another person's land other than the land of the person harvesting the flood waters, it may prevent another person's land from draining. Or conversely, it may prevent another person's land from enjoying a transient flow of rejuvenating water.

35 ASSOC PROF PITTOCK: Absolutely.

40 THE COMMISSIONER: Leave aside the private law of nuisance, which believe me exists but is the crudest of tools quite unrealistic to contemplate in the regulation of that kind of tension between neighbours, are any of you four aware of any work that has been done under the socio-economic banner or the hydrological banner or the environmental banner that deals with either actual or proposed ways of regulating that kind of effect between neighbours? I must say if I were a floodplain farmer, I would be really annoyed if my uphill neighbour kept all the water from a flood.

45 PROF THOM: Commissioner, I have to revert to my coastal – put my coastal hat on now and we have just amended the New South Wales Coastal Management Act to make it very clear under section 27 that those kind of impacts that you have just

described are clearly understood and there are legal recourse if those kind of things happen. So in that particular context I'm very familiar with what the intent of the impact to adjoining land of activities on other person's land may have on the entire biophysical system which is, say, a beach system, a beach and dune system.

5

THE COMMISSIONER: In some systems, the artificial works, say – we will call them levees – that would perhaps flood your uphill neighbour and deprive your downhill neighbour of flow, would be a form of development that would require development consent, which would involve environmental assessment and amenity assessment.

10

PROF THOM: That's exactly what is required in the New South Wales Coastal Act.

15 THE COMMISSIONER: Quite. I have not yet ascertained whether that is true of all the land in the northern Basin that is particularly susceptible to floodplain harvesting issues arising. If it applies then it ought to be but won't be a simple question of finding out the experience of the regulators in that regard. If it is not so regulated then at the moment at least I would have thought that was something that
20 fell squarely within the remit of the MDBA, no doubt in cooperation with the local Basin state, being New South Wales in this case.

25

DR STEINFELD: Yes. States issue works approvals for things like levee banks and structures. I haven't been through the exact requirements. They may consider some of the things you have mentioned. But there's a distinction between the nature of the earth work and the local impacts it might have versus the volume of water that's taken as a result of those earthworks and one, the volume of water requires a water licence, whereas the earthworks structure itself requires the work licence and you need both to be able to use that work for floodplain harvesting. So I imagine the
30 potential is through the works licence where those considerations need to be taken into account rather than the water licence itself, which could be moved from one location to another.

30

35 THE COMMISSIONER: Do I understand correctly at the moment that if you could get a works licence to build a pen and you can get a water licence for the appropriate amount, then you can harvest up to that amount and put it in the pen. Is that your understanding?

40

DR STEINFELD: That's my understanding.

THE COMMISSIONER: What we are talking about doesn't involve necessarily any pumping. It may just be overground flow.

45

DR STEINFELD: It doesn't have to involve pumping.

THE COMMISSIONER: It's opportunist, in a sense. I don't meant derogatively, as the opportunity arises. What is your understanding, then, as to what occurs at the

moment in that hypothetical situation, in order that one may measure whether no more than the licensed amount has been harvested and penned? How do you do that? There's no meter, there's no pump. It's an inquiry. Do any of you know how it is done? If it is done.

5

DR STEINFELD: There's some initial work that has been done to try and understand how you would do that and partly using remote sensing imagery to be able to understand where the water – where the floodplain is being wetted and some of the risk areas and the hot spots. As well as that satellite imagery there's LIDAR
10 imagery that can help understand the 3D surface of the floodplain to see where the depressions are and where there might be other risks.

THE COMMISSIONER: And then, what, there's a form of geometric extrapolation to work out volumes?

15

MR COSIER: Yes.

DR STEINFELD: Yes.

20 MR COSIER: Commissioner, your questions about why is there not such a focus on the loss of beneficial flooding, I've often asked myself the same question. The best, the most notorious is the building of Cubbie Station on the Queensland side of the New South Wales/Queensland border.

25 THE COMMISSIONER: I've heard of it.

MR COSIER: And there are many graziers downstream who were absolutely losers in the ability to capture that beneficial flooding.

30 THE COMMISSIONER: That was the intention, wasn't it?

MR COSIER: Well, the intention was to build a cotton farm.

35 THE COMMISSIONER: The intention was to pen water to prevent it flowing downstream.

MR COSIER: Yes.

40 THE COMMISSIONER: That intention carried with it the intention to cause all the known inevitable consequences of that conduct.

MR COSIER: I'm not sure that they would have thought of that intention but that was a consequence.

45 THE COMMISSIONER: I doubt that, with respect. Somebody who says I will keep this water and use it myself can hardly be said to deny that they thereby intend that the person downstream not use that water. Now, if there is a person who wants

to raise that, no doubt they will put in a submission to this Royal Commission. But at the moment, I can't see how I could possibly resist the inference that a person who traps and pens water for their own use intends that water to be unavailable completely downstream.

5

MR COSIER: So the downstream graziers who have been affected by this process, it has intrigued me equally that in the whole discussion about property rights, why irrigated agriculture had an implied property right from the regular licensing of water which was converted to a permanent right, why that implied right also did not exist to both those graziers and also to indigenous communities.

10

THE COMMISSIONER: Well, there's stock and domestic are the first.

MR COSIER: Yes.

15

THE COMMISSIONER: And there is a very difficult category including the difficult notion of cultural flow for the second and both, I agree with you, are somewhat mysterious administratively.

20

MR COSIER: I think the answer is in the culture, the history of water resource development, particularly in New South Wales in the northern areas, where as we know now, in hindsight, a lot of levees were just built illegally. In fact some of the purchasers of water in the Lachlan in probably Nimmie-Caira, for example, I think that's right, one of the reasons the Commonwealth bought that land was to knock down all the levees that had been built, whether they were lawful or not, I don't know. One would assume that the culture of the 30s, 40s, 50s and 60s was you just stick them up.

25

With respect to the Cubbie Station I would assume that the land holders there felt absolutely powerless because it wasn't even within their own state jurisdiction that they had powers to take any action anyway. So they felt powerless and helpless in the process. So I think a lot of powerlessness is a main driver as to why that hasn't received the public attention that I believe that it should have.

30

THE COMMISSIONER: What I had in mind was that the Basin-wide focus – which is one of the, I think huge merits of the Water Act and the Basin Plan – ought, I would have thought provide a straightforward mechanism to remove individual powerlessness - - -

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MR COSIER: Absolutely.

40

THE COMMISSIONER: - - - as an explanation of what I'm going to call unjust outcomes.

MR COSIER: Yes.

45

ASSOC PROF PITTOCK: Commissioner, with respect to this question, the socio-economic assessment that the authority undertook for the Northern Basin Review is instructive in this matter, in that it quantifies the socio-economic value of that water on the floodplains comparing irrigated use versus beneficial flooding for pastoral production by graziers, and also use by indigenous communities. And so there's some very good data there about the respective impacts on those stakeholders that illustrate this trade-off. And, of course, what's interesting about that with the Northern Basin Review is, despite having that evidence that there are some substantial sectors of society up there that are disadvantaged by this floodplain harvesting, the Authority and the government nevertheless proceeded with the SDL adjustment in the northern Basin that further disadvantages those communities.

THE COMMISSIONER: Yes. Well, if you will just take as what, to my mind at least at the moment appears to be a very poignant emblematic but substantial example and that's the river at Wilcannia. I don't currently understand how that could be expected to be recovered and protected, to adapt the language of the statute, by reducing the amount of water including low flows down the Darling. I just don't understand that at the moment.

PROF THOM: Commissioner, it's somewhat striking to compare that kind of situation – cross border situation with what we know to be the consequences downstream of the great impact that say the Cubbie Station placed on the downstream system, including further downstream for the flows into the Darling into the future. Comparing that with the agreement that took place between New South Wales and Queensland with respect to sand being blocked at the mouth of the Tweed by New South Wales' actions which created the big training wall and an agreement that then allowed that sand to be bypassed with benefits to both sides. So an agreement that was beneficial to both sides of the border with respect to that process. So that the consequences of that structure, namely the Tweed Bypass received benefits on both sides. Whereas what happened with respect to the Darling and the consequences of the Cubbie Station were clearly one-sided and has been.

THE COMMISSIONER: But maybe that's a reflection of the calculus of demographic and political power between the south-east corner of Queensland and the north-east corner of New South Wales, neither of which is exactly poverty stricken.

PROF THOM: That's correct. And understanding the system, understanding the consequences of actions which, from the New South Wales side was deliberate over many years in order to do the training – get those training wall benefits for New South Wales alone and then agreement to know what the consequences were going to be, which was the erosion of the Gold Coast. That particular problem has been sorted out. But we didn't see the same discussion and same debate going on with the north-west corner of New South Wales and southern Queensland.

THE COMMISSIONER: No. Thanks.

MR COSIER: Commissioner, there's one person who I believe might be able to assist you with those sort of questions and that is the former Senator who was the Chair of the Rural and Regional Affairs Inquiry, Senator Bill Heffernan. I think if you were to seek his advice on those questions, you might get some very informed answers.

THE COMMISSIONER: Thank you.

MR BEASLEY: Can I go back to 2,750 now and your January 2012 publication advocating for rejection of the Plan and the comments I took you through about the Plan manipulates science and the Authority's stopped the science being made available and refused to be transparent? We have already had a discussion about, both with myself and the Commissioner, about pages 16 and 17 and 66 to 69 of the ESLT report.

And I've asked you whether you understand what volume of water is attributed to socio-economic outcomes. The answer being, "No, we don't know." Bearing in mind – this is my question now, having said that: bearing in mind the statute requires all functions of the Basin Authority including a determination of the ESLT and setting an SDL that reflects an ESLT, bearing that statutory command in mind of best available science, have any of you seen, what you would regard, as a proper and thorough scientific justification for setting an ESLT at 2,750 for the – as a - - -

MR COSIER: No.

ASSOC PROF PITTOCK: No.

DR STEINFELD: No.

PROF THOM: No.

MR BEASLEY: Do you know of anyone of your colleagues or scientists that you know, whether they're academics or work for a public company or in private practice, that has ever suggested to you that they understand what the scientific justification for 2,750 is?

MR COSIER: No.

DR STEINFELD: No.

PROF THOM: No.

ASSOC PROF PITTOCK: No, and on the contrary, I think you've already spoken to Dr Colloff and others who had some insights into that calculation, and I believe their conclusion was no.

MR BEASLEY: If you include Professor Williams, Professor Kingsford in that as well, yes, no one has been able to help us there, but I just thought it was worth a try if you had a name. And I take it you haven't received – tell me if I'm wrong, I don't want to put words in your mouth, but have any of you received any form of
5 satisfactory explanation from anyone at the MDBA from a scientific perspective that justifies 2,750?

MR COSIER: No.

10 ASSOC PROF PITTOCK: No.

DR STEINFELD: No.

PROF THOM: No.
15

MR BEASLEY: Have you asked them?

MR COSIER: Yes. Many, many times, both in writing and verbally.

20 MR BEASLEY: All right. Can I move on with this report? One of the – in this publication in January 2012, one of the points you make is that the guide contained far more detail than the ESLT report concerning environmental watering requirements and whether they're achieved and what flow is required to meet ecological outcomes, and you give an example at the table at page 7. Just tell me
25 when you have that. It's table B14.6, 'Environmental Water Requirements Hattah Lakes' and it's - - -

ASSOC PROF PITTOCK: Yes.

30 MR BEASLEY: - - - your example of information contained in the Guide to the Basin Plan 2010. Just for the Commissioner's reference, that is page 651 of appendix B to the technical Guide. These things aren't entirely straightforward. I thought I had tendered the entire technical Guide. What I tendered was up to page 431. There's actually about 600 pages to go which ultimately will join the tender
35 - - -

THE COMMISSIONER: Thank you.

40 MR BEASLEY: - - - which is why I couldn't originally find this, but as an example of the sort of information that informed the Guide, we have this table which, in the far left-hand column, and tell me if I'm getting this right, sets for the Hattah Lakes, various ecological targets.

ASSOC PROF PITTOCK: Yes.
45

MR BEASLEY: So maintain 100 per cent of the extensive semipermanent and persistent temporary wetlands in good condition, maintain 80 per cent of the current

extensive temporary wetlands in good condition. Then maintenance of red gum forests and, underneath that, maintenance of episodic wetlands and good conditions and maintain 50 per cent of current extent of Black Box Woodland in good condition, and then it has what the flow required, measured at use and is for those
5 various scenarios, but also, in terms of the event, an indication of the duration required. For example, at 40,000 megalitres a day, two months in total, seven day minimum. Gives estimate of timing, that is, June to December. So we're picking up winter and spring in terms of when the preferable flow is required.

10 Then there's proportion of years in percentages required to achieve the target and both low uncertainty and high uncertainty ranges. Then the last two columns, we have proportion of years where that event had occurred under – without development conditions and proportion of years occurred under modelled current arrangements which would be the baseline. So that was an example of the sort of information that
15 was supplied in the guide. You contrast that at page 9 of this submission with a table that is, I don't think we need to go to it because this sets it out accurately, unless it can't be read properly, but you call it Information in the Draft Plan for Only Four of the 18 Key Environmental Assets.

20 Do you see that at the top of page 9?

ASSOC PROF PITTOCK: Yes.

MR BEASLEY: Can I, firstly, just clarify where you're saying draft Plan, this table
25 that is actually found at page 91 of the ESLT report, by the reference to draft Plan, do you mean ESLT report or that and something else?

DR STEINFELD: I'm not - - -

30 MR BEASLEY: Do you need to think about that overnight?

DR STEINFELD: I'm not aware – yes, let's have a - - -

MR BEASLEY: All right. Just to help you, you've got a footnote to that heading
35 Information for the Draft Plan for Only Four of the 18 Key Environmental Assets. I think the footnote is to the ESLT report. I've found this table on page 91 of the ESLT report. So my first thing for you to consider overnight is, when you refer to draft Plan, do you mean the ESLT report or do you mean that plus some published draft Plan at the time? My second question for you to give consideration to – and
40 I'm not sure if you can tell me this now – the heading mentions for “only four of the 18 key environmental assets”. I'm just wondering whether that's meant to be four of the 18 key environmental asset indicator sites? You can tell us that tomorrow as well.

45 DR STEINFELD: Okay.

MR BEASLEY: It's just that there's 2,442 key environmental assets, but I know there's 18 key environmental asset indicator sites, and I think that might be what you're referring to. So if you can give us those two clarifications tomorrow morning, but the point you – the criticism you make of this diagram being included in the
5 ESLT report is that it has results for various modelled scenarios of baseline 2,400, 2,800 and 3,200 gegalitres. In relation to semipermanent woodlands and temporary woodlands and – sorry – fringing red gum forest and river red gum woodland, and it shows very little difference between 2,800 and 3,200 gegalitre scenarios as an example, but what it's left out is episodic woodland and Black Box Woodland which
10 require far more flow to reach, and that is where there's a significant difference between a 2,800 gegalitre Plan and a 3,200 gegalitre Plan; correct?

MR COSIER: That's certainly my memory that it was quite convenient to leave those two off the reporting of the outcome.

15 MR BEASLEY: All right. Just in terms of why Black Box Woodland would not be an important environmental asset, you would want to know what was happening with a 2,400 or a 2,800 or a 3,200 gegalitre plan. My memory – and you will have to forgive me of doing some work for mining companies in New South Wales – is that
20 Black Box would land, for example, as an endangered and ecological community under the Threatened Species Conservation Act in New South Wales, and I think probably also under the Commonwealth Act.

ASSOC PROF PITTOCK: Black Box Woodlands sits higher on the floodplain - - -
25

MR BEASLEY: Yes.

ASSOC PROF PITTOCK: - - - and, therefore, is harder to water through managed events.
30

MR BEASLEY: Yes.

ASSOC PROF PITTOCK: And so you would need higher environmental flows to maintain Black Box Woodland areas in good condition.
35

MR BEASLEY: And, hence, that's where you're going to start to see some real divergence between plans where a different level of flow is needed than from ecological communities that are closer to the banks of the river.

40 ASSOC PROF PITTOCK: Absolutely.

DR STEINFELD: Can I clarify a couple of points about that?

45 MR BEASLEY: Yes, please.

DR STEINFELD: That figure does refer to the ESLT report, and subsequent to the ESLT report, the Murray-Darling Basin Authority released a hydrological modelling

report in 2012 and it came out a month after the Wentworth Group published the report in January 2012, I think.

MR BEASLEY: Yes.

5

DR STEINFELD: So we didn't have the information available when we put this report out. But in the hydrological modelling report, the Murray-Darling Basin Authority said that the – the demand time series didn't attempt to reinstate flow indicator five or six, so that's the ones with the question mark, because of the system constraints that indicated that achieving 120,000 to 150,000 megalitres a day flows by active flow management would be difficult due to existing flood mitigation constraints. These events are dependent on large flow events from a number of tributaries and potential storage spills and are beyond the scope of managed watering events. Subsequent to the hydrological modelling report, the Murray-Darling Basin Authority released in 2013 – 2012, sorry, the relaxed constraints report.

10

15

MR BEASLEY: Yes. Yes.

20

DR STEINFELD: Where the Authority looked at, for the 18 assets on the River Murray, 11 of them could be achieved under the 2,800 scenario, but by increasing the volume of water to 3,200 and then relaxing constraints, they could actually achieve 17 out of the 18.

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MR BEASLEY: Yes.

DR STEINFELD: So that gives you an indication of how the volume combined with the relaxing constraints can achieve some of those really important benefits for Black Box communities on the outer floodplain.

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MR BEASLEY: All right. Thank you. If I can take you to the bottom of page 11, you make a fairly strong criticism of – actually, before – can I ask you overnight to also see if you can give me a reference to – there's a box on page 11 of this document that is headed 'An Example of Delivery Constraints Described in The Draft Plan Documents', and you've got a footnote and the footnote is to the ESLT report, but I can't find that box – that table 5.1 in the ESLT report. I'm just wondering whether it has come from somewhere else. It could be my mistake. Dropping down, you do have a quote from page 46 of the ESLT report in relation to the Authority's explanation that there may be opportunities for works and measures to overcome delivery constraints and provide other outcomes.

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45

These actions could deliver substantial benefits, etcetera, etcetera, and this may be considered as part of 2015 review, describe that as an observed proposition. You state the reasons why – over the page at the top of page 12, concerning how much money is being spent without knowing very much. Then there's a reference to the CSIRO science review and that is concerning the failure of the modelling – sorry, the modelling showing that a 2,800 gigalitre scenario is not consistent with the currently stated hydrological and ecological targets, given the available evidence base, and that

is exhibit RC9 and a reference to that, so the Commissioner knows, is page 29 of that report. We have already covered that in evidence. And then we come to groundwater.

5 MR COSIER: Can I - - -

MR BEASLEY: Yes, go ahead.

10 MR COSIER: Peter Cosier here. To answer your first question, I have a very strong feeling I know who wrote that sentence, and he's not with us today. It's either Dr John Williams or Mr Tim Stubbs, but the explanation - - -

MR BEASLEY: Is this the sentence observed?

15 MR COSIER: This is a simply observed proposition.

MR BEASLEY: Yes.

20 MR COSIER: The explanation, however, I believe is self-explanatory in the following two paragraphs.

MR BEASLEY: Yes.

25 MR COSIER: So are you happy with that explanation or would you prefer we followed up further?

MR BEASLEY: I am and that's why I didn't ask any further question. I understand the reasoning being given. Unless there's something further you want to say about it.

30 MR COSIER: No, no, I would be relying on Dr Williams and Mr Stubbs for that.

35 MR BEASLEY: All right. At page 13, the issue of groundwater is raised and this is an issue that Professor Williams gave some evidence about, about his failure to understand, I think he - I've forgotten the word he used whether he was dumbfounded or something worse than that in relation to how an increase in groundwater extractions that the Basin Plan provides for cannot be taken into account when you're setting your surface water SDLs because of connectivity.

40 MR COSIER: Yes.

MR BEASLEY: That is the same point that you're seeking to make in this section that you were seeking to make in this section of the report.

45 MR COSIER: Yes, it's Peter Cosier here. I don't know if it is in the report or not because I'm not quite - I'm not as familiar with this one as the other work that we have done but we did make reference to the National Water Commission making a -

well, a clear policy recommendation that you assume that the groundwater is connected to river water - - -

MR BEASLEY: Just to help you there.

5

MR COSIER: - - - unless shown otherwise.

MR BEASLEY: If you go to page 14 of your publication here, and just above the diagram, connectivity of groundwater systems in the Lachlan catchment, you will see a sentence that commences:

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You can only use the water once. If you take the groundwater from these aquifers, you will lose surface water because there is a high level of connectivity between the alluvial aquifers and the river as shown in the figure below.

15

MR COSIER: Yes. So a slightly more detailed explanation – and I’m not an expert in this field – is that some groundwater systems are absolutely connected and we’re talking about the alluvial aquifers in that example. There may be other groundwater systems that are self-contained systems and actually don’t lead to the river system. And so you have two options in a public policy sense. The first option is to do more research and science to identify which are which and make an estimate and take a risk assessment on that estimate. The second option is, as I referred to the National Water Commission saying, in the absence of that information, if you were to take the precautionary principle into account, you would assume connectivity unless otherwise demonstrated.

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MR BEASLEY: Does anyone else want to add to that issue between background water?

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PROF THOM: The only point I would make is, as I think we explained earlier, one of the founding members of the Wentworth Group, Professor Peter Cullen, and I recall in those discussions we had with respect to our second blueprint, one of the points that Peter insisted on us understanding was that connectivity between groundwater and river waters. And implanted on my brain was Peter Cullen’s words on that so he was the expert on that.

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MR COSIER: There was a famous photograph which emanated from Victoria, where a landholder was not able to take water from the river and so had sunk a spear pump on to the sandbank adjoining the river and lawfully extracted the water.

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MR BEASLEY: Thank you. Commissioner, I’ve still got to cover climate change, Murray Mouth, SDL adjustment, northern Basin. We will certainly still finish in the time available because I want to move to another topic, it’s nearly 4 now so - - -

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THE COMMISSIONER: Yes. The sum of the groundwater SDL resource units, to use the expression in the Basin Plan, should I understand that as being when the

Basin Plan was first made a greater volume than had been understood to be the subject of extraction immediately beforehand?

5 DR STEINFELD: Yes. In our review report, I don't know what figure, but we've provided a graph of the groundwater extracted in the Murray-Darling Basin from 1999 to 2016 and the highest volume in that period was about 1,700 gigalitres of groundwater being used and that was around 2006, 2007 so really in the heart of the Millennium Drought. In the guise that a base line diversion limit of about 1,786 gigalitres, and that seemed to reflect the highest that we have on record levels of
10 groundwater extraction. The current version of the Basin Plan has a figure of 2,386 gigalitres, which is almost about 500 gigalitres more.

THE COMMISSIONER: I realise the time of the afternoon but I want some stuff to think about.

15

DR STEINFELD: Sure.

THE COMMISSIONER: In short form, what's the explanation for that? What's the explanation of that varying material increase?

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MR COSIER: We don't – well, unless – I stand to be corrected but we don't know and were never informed as to the basis of that increase. Again, Dr – you may well have asked Dr Williams that question and I haven't read all of his evidence but I am assuming he said the same thing. If he didn't, I would defer to his statement rather
25 than mine.

THE COMMISSIONER: Well, now, under chapter 7, part 4 of the Basin Plan, there can be adjustments relating to groundwater. And those adjustments are on the basis of what is variously called new or improved or better information. Those are the
30 words of the Plan. And the adjustments are such as may be proposed by the Authority. And the adjustments include a decrease of the sustainable diversion limit by the amount necessary to represent an environmentally sustainable level of take. So it goes down as well as up, depending upon better information. I'm concerned that there is thereby a form, I much regret to say, of a possible institutional perverse
35 incentive, not to find out better information, lest it produce the possibility of the Authority considering a reduction in SDL.

MR COSIER: That's - - -

40 THE COMMISSIONER: Which I understand is not a popular thing.

MR COSIER: That's correct. So if a property owner had access to a groundwater resource and was confident that that would have no impact on the SDL then you would do research and get an adjustment upwards. But if they were to find the
45 opposite then of course they are not going to disclose that because it would end up in the opposite - - -

THE COMMISSIONER: Also, the Authority has the power and the function of investigating these things for itself. It has a function: monitoring, measuring water resources.

5 MR COSIER: We assumed at the time that it was only an assumption that was based on no evidence that the driver for the increase in the SDL for groundwater was coal seam gas extraction, particularly in the northern part of the Basin but we don't know because we were never provided any evidence to that effect.

10 MR BEASLEY: Groundwater was discussed by Professor Williams starting at transcript page 296, where he discusses a CSIRO report in 2008 which suggested that there had been over-extraction of groundwater in several groundwater units, and as a hydrologist he couldn't understand how you could set a surface water SDL without considering what you were doing in terms of a groundwater SDL. He couldn't
15 understand how you could increase extractions for groundwater and that not have an impact on surface water SDLs and he raised it several times with the MDBA and was given no satisfaction. He was saying, guys, what's going on, how did you get that? And was given no documents or information that helped him understand, which led to his – the word I was looking for was bewilderment.

20 THE COMMISSIONER: Those who wrote the Basin Plan thought there was a connection, and hence the reference to connectivity, to the surface water. There's no doubt that they regarded information about connectivity with surface water as of particular significance to the possibility of better information, prompting either an
25 adjustment to increase or an adjustment to decrease an SDL.

MR COSIER: We also, and I would assume Dr Williams gave evidence to this effect too, that we also understood that in determining the SDL – in running the models for the SDL, the people running the model were instructed not to factor in
30 groundwater losses in that model. But again, that is second-hand or third-hand information. We have no evidence to substantiate that.

THE COMMISSIONER: Well, if there were transparency of method, you wouldn't need to rely upon second and third-hand.

35 MR COSIER: That's correct.

THE COMMISSIONER: Is that a convenient time?

40 MR BEASLEY: Thank you. So we will resume at 10 tomorrow morning?

THE COMMISSIONER: Yes, if that is when people want to resume. I'm happy to resume earlier, if people want to?

45 MR BEASLEY: Well I'm not that keen on going outside of the normal hours. Someone told me we had to be here until 4.30. I don't know who that mad person was that suggested that was a good idea but I'm going to find out and put their name

on some paper and you know what I'm going to do with it. But in any event I think it's a good time to break, Commissioner.

5 THE COMMISSIONER: We will adjourn until 10 o'clock here tomorrow. Thank you, 10 o'clock in the morning. Thank you very much. See you tomorrow.

<THE WITNESSES WITHDREW

[4.06 pm]

10

MATTER ADJOURNED at 4.06 pm UNTIL WEDNESDAY, 11 JULY 2018

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