



**AUSCRIPT AUSTRALASIA PTY LIMITED**

ACN 110 028 825

**T:** 1800 AUSCRIPT (1800 287 274)

**E:** [clientservices@auscript.com.au](mailto:clientservices@auscript.com.au)

**W:** [www.auscript.com.au](http://www.auscript.com.au)

**TRANSCRIPT OF PROCEEDINGS**

---

O/N H-927219

**MR B. WALKER SC, Royal Commissioner**

**IN THE MATTER OF THE MURRAY-DARLING BASIN ROYAL COMMISSION**

**ADELAIDE**

**9.59 AM, FRIDAY, 21 SEPTEMBER 2018**

**Continued from 20.9.18**

**DAY 28**

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

MR BEASLEY: Whenever you're ready, Commissioner.

THE COMMISSIONER: I'm ready. Thank you.

5 MR BEASLEY: All right. One of the things we've discussed but not decided on  
was whether there will be a day in October for final statements by me. I note that  
section 21(4) of the Water Act requires the Basin Authority and the Minister in  
exercising any of their powers and functions to take into account the principles of  
ecologically sustainable development. One of my submissions will be the Basin  
10 Authority is not taking into account the principles of ecologically sustainable  
development in much of their work.

I'm pleased to advise though that in terms of their internal operations, they are taking  
into account principles of ecologically sustainable development. Mr Traeger  
15 Research Officer has found out that they are recycling paper and cardboard and  
recycling printer cartridges which is something they've put on their website. So I'm  
not sure that that's saving much water, but they are at least aware of the concept.

I would also like to tender this morning some of the documents that I referred to  
20 yesterday in relation to responses by state governments to your request for  
clarification – your request for them to answer questions that you posed to them in  
response to the submissions that the state government – various state governments  
have lodged. I won't go through all the submissions, but each state, that is, South  
Australia, Queensland, New South Wales and Victoria, those Basin states have all  
25 filed a submission with the Commission.

In relation to the State of Queensland, you wrote to them on 7 September 2018,  
posing a series of 23 questions upon which you sought their assistance. We're told  
30 that there will be a response from the Queensland Government to those questions,  
but we're told it is unlikely that they will accept your invitation for anyone to  
actually appear at a hearing. In relation to the New South Wales Government, they  
lodged a submission. You wrote to them also on 7 September posing 22 questions to  
the State Government of New South Wales. That's a document behind tab 21 of the  
folder I'm going to tender.

35 By letter dated 14 September 2018 from Ms Kathleen Hainsworth from the Crown  
Solicitor's Office of New South Wales, she advised Ms Masters, Senior Instructing  
Solicitor for the Commission that New South Wales declined – respectfully declines  
your invitation to provide written responses to the questions you've asked and to  
40 attend the Commission hearing. They do however – they have however in the three  
short paragraph letter of response to your request to answer questions and attend the  
Commission, have provided you with a large number of website links. Some five  
pages of website links that you can, if you so wish, go through to find out whatever  
information there is to find out by going to those various websites from the New  
45 South Wales Department of Industry in the main.

I have to say that when the New South Wales Government in this letter to you of 14 September – sorry, Ms Hainsworth of the Crown Solicitor’s Office on behalf of the New South Wales Government says that the State of New South Wales respectfully declines your invitation to answer questions. In my submission, this is not a  
5 respectful response. The questions you have asked, as I said yesterday, are basic questions in relation to the implementation and legality of the Basin Plan. They are questions that each of the Basin state governments should be able to answer almost immediately, and the non-response by the New South Wales Government is both strange and, with respect, disrespectful, in my submission, and quite bizarre in terms  
10 of it providing you with about 50 website addresses that they suggest you look at.

In relation to the Victorian Government, they provided – there’s a letter from the Premier, Mr Andrews, enclosing a submission from the Victorian Government. That letter is dated 31 July 2018. For some reason the submission arrived in the middle of  
15 August. That submission is three and a half pages which prompted again a letter from you of 7 September 2018 posing 20 questions in relation to implementation, legality, etcetera, of the Basin Plan, and I won’t repeat what I said yesterday concerning the contact between the Victorian Government Solicitor’s Office and Ms Masters, suffice to say that we’ve been told that – we haven’t been told anything.  
20 Haven’t been told whether they’re going to answer the questions. Haven’t been told whether they intend to have someone come here to appear. In relation to the South Australian Government, the South Australian Government has provided a detailed response to a series of questions you sent to them. A series of supplementary questions was then sent to them and they are in the process of answering those, and  
25 Mr Bruce will be attending to give evidence next Wednesday. So I will tender the entire bundle entitled ‘State Government submissions’ - - -

THE COMMISSIONER: Thank you.

30 MR BEASLEY: - - - as one. They can be marked as one exhibit, I think.

THE COMMISSIONER: Thank you. It should I think be clear by now that among the terms of reference there are issues that I am required to consider by way of illustration, number 6 requires me to inquire into and report upon any impediments to  
35 achieving any of the objects and purposes of the Act and Basin Plan, etcetera. And defects, shortcomings, or obstacles to what has come to be called transparency in relation to the administration of the Plan is obviously a topic that I will be addressing in that regard. And the conduct of the various governments to which you’ve referred will most likely be the subject of adverse comment by me in my report unless  
40 something were to change between now and then.

MR BEASLEY: Thank you Commissioner. There’s one important thing I just overlooked. I’m going to forgive myself for it given their continual non-attendance here. I forgot the Commonwealth Government. How could you do that? On 7  
45 September 2018 a letter was sent by Ms Masters to Jessica Parker of the Australian Government Solicitor whereby an invitation was sent from you asking Commonwealth and MDBA people to attend to – attend at these public hearings and

give evidence. We've received a response from Australian Government Solicitor of 13 September 2018 which indicates that the Commonwealth and the MDBA will provide a written submission to the Commission by no later than 10 October 2018 which is only about four months late, maybe five months, but:

5

*We are instructed to advise that the Commonwealth and the MDBA do not wish to take up the invitation to appear in person.*

10 Simultaneously or nearly simultaneously with that letter, in fact, on the same date, the Honourable David Littleproud MP the Minister for Water Resources issued a media release entitled; 'Cooperating with the South Australian Murray-Darling Royal Commission' which may or may not be a misleading headline to this media release again indicating that a written submission would be provided to the Commissioner by 10 October, but neglecting to advise that the invitation for actual  
15 witnesses to attend from the MDBA or the Commonwealth had been declined.

I will tender that media release. On a completely unrelated topic, yesterday, during the course of the submissions by Dr Carmody from the New South Wales EDO, you and Dr Carmody and myself had a discussion about the Australian Government  
20 Solicitor's – I'm not sure whether it's an entire advice – yes, it is an entire advice of Dr Robert Orr QC and Helen Neville. I will tender that advice which is headed 'The Role of Social and Economic Factors in the Basin Plan'. I'm wondering whether, rather than giving it a separate exhibit, in my opening I tendered a number of  
25 opinions by academics and others concerning the proper construction of the Water Act. It may be that this can just be added to that exhibit, but I'm content for it to be handled whatever way is easiest for Ms Geppa. Otherwise, she will get really upset. So do you already have those documents?

30 THE COMMISSIONER: Yes.

MR BEASLEY: You do. Right. When I said I would tender the folder of documents headed 'State Government Submissions' and I said I will tender the entire brief, I'm told there's a few tabs in there that contain things like transmission seats and whatnot that don't need to be tendered, and that can be sorted out. And I will  
35 hand this to your associate, and she can make a note of the tabs and documents not to be tendered. That brings us to Dr Pitman, Commissioner, who's here to give evidence.

40 <ANDREW JOHN PITMAN, AFFIRMED

[10.11 am]

<EXAMINATION-IN-CHIEF BY MR BEASLEY

45

MR BEASLEY: I was just chastised for calling you Doctor, but I think you are doctor, but you are also professor. So I will stick with Professor. My apologies. You actually have a PhD in Atmospheric Science from the University of Liverpool?

5 PROF PITMAN: Correct.

MR BEASLEY: And before that, you had a Bachelor in Physical Geography with Honours from the University of Liverpool?

10 PROF PITMAN: Correct.

MR BEASLEY: You have amongst other highlights of your career been short-listed a number of times for the Eureka Prize for Science Leadership?

15 PROF PITMAN: Yes, correct.

MR BEASLEY: You've been awarded the Connally Memorial award?

PROF PITMAN: Yes.

20

MR BEASLEY: Jointly won the Copenhagen Diagnosis and, again, shortlisted that year for the Eureka Prize.

PROF PITMAN: Correct.

25

MR BEASLEY: Won the New South Wales Climate Scientist of the Year in 2010.

PROF PITMAN: Yes.

30 MR BEASLEY: Won the 2010 Future Justice prize?

PROF PITMAN: Indeed.

35 MR BEASLEY: You weren't ever short-listed for bachelor of the year, were you, at any stage? No.

PROF PITMAN: No, sadly.

40 MR BEASLEY: You have been a member of the New South Wales Minister for Climate Change Science Advisory Committee.

PROF PITMAN: I have.

45 MR BEASLEY: Member of the World Climate Research Program Science Steering Committee?

PROF PITMAN: Yes.

MR BEASLEY: Former Chair of the World Climate Research Programs Land Committee on Global Land Atmospheric System study?

PROF PITMAN: Yes.

5

MR BEASLEY: Former Editor of the Journal of Climate.

PROF PITMAN: Yes.

10 MR BEASLEY: Former Director of the Australian Research Council Centre for Excellence for Climate System Science 2011/2017.

PROF PITMAN: Indeed.

15 MR BEASLEY: And there's a Centre of Excellence in Sydney, actually, but it's a bar I go to. Director of the Australian Research Council Centre of Excellence for Climate Extremes from 2017 to present.

PROF PITMAN: Correct.

20

MR BEASLEY: And that's hosted by the University of New South Wales?

PROF PITMAN: Yes, it is.

25 MR BEASLEY: Could you explain what the Australian Research Council Centre of Excellence for Climate Extremes is all about and what your role is in it?

PROF PITMAN: I can. The Centre of Excellence is a competitively funded research centre. It's funded by the Australian Research Council. There are probably  
30 20 Centres of Excellence across the country from quantum physics through to .... I lead the only one in climate science or climate extremes. It's a collaboration led by the University of New South Wales with Monash, Melbourne, Australian National University and the University of Tasmania. We collaborate with CSIRO and the Bureau of Meteorology and then with NASA and UK Meteorological Office and a  
35 variety of groups around the world. So we are the premier centre in the southern hemisphere, and we like to think we're pretty competitive with the best in the northern hemisphere.

MR BEASLEY: I'm sure that's right. You've written extensively and been  
40 published extensively on the issues of, amongst other things, climate change science and the causes of drought?

PROF PITMAN: Yes.

45 MR BEASLEY: Right. And if you – you've got a brief in front of you of documents. The first I wanted to take you to is behind tab 1. You were part of a working group of scientists in 2007 that was commissioned by the Federal

Government to produce a publication called 'Climate Change in Australia Regional Impacts Adaptation, Managing the Risk for Australia'?

PROF PITMAN: Yes.

5

MR BEASLEY: Was that commissioned by the Howard Government or the Rudd Government?

PROF PITMAN: Howard Government.

10

MR BEASLEY: Right. And I think you're listed in the working group towards the back of this paper in appendix 2. I take it everyone in the working group – this is page 48 of the document – everyone in the working group there was some form of scientist?

15

PROF PITMAN: Yes. I think that would be true.

MR BEASLEY: Some were economists, and we've got people no doubt with plant expertise or crop expertise and people like you with climate change expertise?

20

PROF PITMAN: Yes.

MR BEASLEY: All right. And - - -

25 THE COMMISSIONER: What's Professor Whelan's discipline, do you know?

PROF PITMAN: Can't remember.

THE COMMISSIONER: That's all right.

30

MR BEASLEY: Can I ask, was this a – was each part of this report a joint effort or did anyone in particular take responsibility for any particular part, and if so, what part did you take main responsibility for?

35 PROF PITMAN: No. It was a report written basically by consensus.

MR BEASLEY: Right, collaboratively?

PROF PITMAN: Collaboratively with everyone contributing to the report as a whole, but individual people would have had carriage of particular sections.

40

MR BEASLEY: Right.

PROF PITMAN: But it was owned by the whole group jointly.

45

MR BEASLEY: All right. I want to take you to a couple of parts in this report, and because it's a 2007 report, I just want to get your views about whether the opinions expressed within it are still current. Page 7 starts off:

5           *Australia and climate change.*

Part 2 of this report, and headed boldly 'Temperature Has Increased'. There's no doubt that Australia – sorry, is there any doubt that Australia in particular focusing on the Murray-Darling Basin, the projections are for increases in temperature  
10 generally.

PROF PITMAN: Correct. The only way that that won't happen is if somehow the laws of physics change between now and 2030.

15 MR BEASLEY: Yes, and the likelihood of that is?

PROF PITMAN: Zero.

MR BEASLEY: Not high.

20

MR BEASLEY: We call that, what is it, a low level of certainty or something. More specifically, pages 12 and 13 of this report actually start to address projections of possible temperature increases, and there's an optimistic scenario on page 12 and a more challenging scenario on page 13 with temperatures across Australia by  
25 average increasing one degree to two degrees by 2030 and three degrees to six degrees by 2070.

THE COMMISSIONER: Could I just ask about those dates. Is there some reason for selecting 2030 and 2070 for these model projections?

30

PROF PITMAN: So you have to be very careful and if I unpack that for you briefly. Climate models run without knowing any calendar date. They're – I can explain what climate models are if you're interested, but those specific dates shouldn't be thought of as a calendar date in the sense that you would normally use them. So  
35 those projections are for a period around 2030 and a period around 2070, commonly 10 years either side, and they're indicative of the kind of situation we would find around 2030 and around 2070.

THE COMMISSIONER: Is there a climatological reason that the 40 year intervals  
40 .....

PROF PITMAN: No, it's just near future and far future.

THE COMMISSIONER: Okay.

45

PROF PITMAN: So classically, in the near future, the impact of CO<sub>2</sub> is small, relative for variability, but by 2070, is the dominant driver of climate change. So it's

the main cause of what happens by 2070. By 2030, CO<sub>2</sub> is having an impact, but so does natural variability. That make sense?

THE COMMISSIONER: Yes. Thank you.

5

MR BEASLEY: I will ask you about climate models in a second, but I wanted to ask you this, and it's something we discussed when we spoke. For people not educated in climate change scenarios, they might look at a one to two degree average rise or a three to six degree average rise and think well, that's not that bad. That's not a proper understanding of the potential impacts of climate change, is it?

10

PROF PITMAN: So I do think the climate scientists generally have failed to communicate what one degree or two degree means. It is in the annual average and

- - -

15

MR BEASLEY: It's the extremes, though, that you're going to get from - - -

PROF PITMAN: It's the extremes that occur disproportionately rapidly as a consequence of the warming of one or two degrees that really should concern people. So this is the annual average. Once you break it down to seasons, you see much larger changes than that in summer.

20

MR BEASLEY: Yes.

25

PROF PITMAN: And if you look at extremes, they are significantly – they increase significantly more than implied.

MR BEASLEY: So one of the things that some scientists that have given evidence at this Commission and have said by means of criticism of the Basin Plan is that the sustainable diversion limit has been, for the Basin has been determined by way of a long-term average and we have an incredibly variable climate which I don't think anyone disagrees with. Equally, if you just look at long-term average changes in temperature projections you're not getting the whole picture, as you just said. It's the extremes that are potentially going to do the damage to people, economies, crops, etcetera?

30

35

PROF PITMAN: Unquestionably.

MR BEASLEY: In the sense that if there are – the average may be one thing. It may be an average increase of two degrees or three degrees, but if that results in a large increase, for example, in days, there's an example in the Basin of temperatures over 45 degrees you're going to get crop destruction, correct?

40

PROF PITMAN: That's absolutely true. It's easy to imagine because if winter cooled by five degrees and summer is warmed by five degrees, there would be no change in the average, but it would be catastrophic for various sectors across the Basin.

45

MR BEASLEY: Yes. Now - - -

THE COMMISSIONER: In fact, although that it's a neat way of pointing out how the different data and the arithmetic of a mean produces no change, as I read these  
5 figures, figures 10 and 11, however, we're not expecting that extremes at the cold end will change as much as extremes at the hot end; is that right?

PROF PITMAN: That's absolutely correct, but this is work published – this is based on work published in about 2005. I think we've seen for instance this winter  
10 record cold conditions as a consequence of a very dry atmosphere. So we are actually seeing some of the extremes at the cold end, not increasing as much as expected, not warming as much as expected. So it is complex.

THE COMMISSIONER: To put it generally, not all the crops benefitted from more  
15 frost?

PROF PITMAN: No. Some do, some don't.

THE COMMISSIONER: Yes.  
20

MR BEASLEY: So, and I'm right – and please everything I put to you, if I'm wrong, please don't hesitate to tell me, but – that doesn't go for the Commission staff, but it does go for you – it's – climate change projections are in – there's inherent uncertainty involved in them. It's not a precise science.  
25

PROF PITMAN: Of course.

MR BEASLEY: But the fact that there are going to be – sorry, that it is likely, there is likely to be longer periods of hot weather in the Basin is reasonably certain now on  
30 current work, correct?

PROF PITMAN: So I think you need to unpack what we mean by certainty and uncertainty. The fact that it's going to get warmer is certain. The fact that hot extremes will deteriorate, become worse is certain. The areas where you get  
35 uncertainty is by how much it will get hotter and by how much periods of extremely hot weather will increase, but the fact it will get hotter and those hot periods will become longer is not in discussion.

THE COMMISSIONER: Implicit in what you've just said is that calendared  
40 milestones are inherently uncertain?

PROF PITMAN: Yes, absolutely. And, in fact, we are - - -

THE COMMISSIONER: Every date I read in these figures has to be read with that  
45 caution, doesn't it?

PROF PITMAN: Absolutely, and, in fact, we might come onto this later, perhaps, but I think the climate science community can be criticised for having been too conservative in how rapidly climate extremes can change. Things like, we are going to get 2030 climates, in fact, we probably almost have already.

5

THE COMMISSIONER: Well - - -

MR BEASLEY: Sorry, can I pick that point up. Is that conservatism that you're talking about, and I think you mentioned this when we spoke, that that conservatism comes from, does it not, the desire in published peer review work to not speculate too much, but stick to what is most certain? That may be a rough way of saying what I think you're trying to get at, but is that basically right?

10

PROF PITMAN: Science isn't about speculation. It's about what you can publish in the international literature with absolute rigor, and the standard is 95 per cent certainty. Occasionally, 90 per cent certainty, but everything we try and publish has to be correct, 90 to 95 per cent sure.

15

THE COMMISSIONER: You're talking about the confidence?

20

PROF PITMAN: Confidence intervals, yes. You have to be basically confident that someone can't show you were wrong because in science that's pretty bad. As a consequence of that, you tend to be conservative in what you will put out there into the scientific literature. That tends to mean that you need multiple lines of evidence all in support of a particular conclusion. That is a very different approach to if you're asking the question what are the rarer scenarios, what are the extreme scenarios, what's plausible, what should you be concerned about in terms of risk management?

25

MR BEASLEY: If you were advising a Government Minister as distinct from writing a paper to be published in a journal, I assume you would be less conservative in the advice that you would give he or she concerning the rapid increase, the relatively rapid increase in temperatures caused by CO<sub>2</sub> emissions and greenhouse gas emissions; would that be right?

30

PROF PITMAN: I have certainly done that in the past.

MR BEASLEY: Right.

THE COMMISSIONER: Now, if I look at figures 19 and 20, for example, pages 54, 55, I take it that like the other figures we've looked at, it would be a good idea for me to imagine that there is an asterisk attached to each of the indications 2030 and 2070, some part of a footnote that said plus or minus 10 years and in any event precision is not part of the exercise?

40  
45

PROF PITMAN: And we're on rainfall now so first of all yes, you're right there should be an asterisk, secondly our confidence around how rainfall will change is much more limited than how temperature will change.

5 THE COMMISSIONER: Yes?

PROF PITMAN: And these, as I said, come from 2005-type science. I think you would be very cautious taking those two figures literally.

10 THE COMMISSIONER: And that's the rubric that heads appendix 4, referring to the output of 50 international climate models that have been assessed in terms of their ability to simulate Australian climate. They are I take it variable in their designs and achievements concerning modelling capacity?

15 PROF PITMAN: That's correct and one of the major changes since this report came out and now is there has been a whole additional international effort to re-run the climate models that have been updated scientifically. So there's a whole new body of evidence that you could rebuild their scenarios on. But secondly, we've learned – these are averages over multiple models. These are called ensembles.

20

THE COMMISSIONER: Is it as it were a quality weighting as if it were a better analysis?

25 PROF PITMAN: You can do it in many different ways. You can quality weight or you can independence weight. I think we have learnt one of the big lessons is that you don't get a better answer if you average over multiple models. What we now tend to do is look at the individual models that have been quality controlled and look at the probabilistic projections for rainfall over the Murray-Darling model by model. It might well be that you get a certain number of models saying it will get wetter and  
30 a certain number of models saying it will get dryer. You weight those, usually by expert judgment, to form a view on what's going on. You don't average over multiple models. You hide the – you hide lots of problems if you average over lots of models.

35 THE COMMISSIONER: Thank you. This is almost certainly, at least scientifically, an unfair question. With the revisiting, one hopes improvements of models and depreciation of models, is the message that was conveyed in 2007 by figures 19 and 20 more or less optimistic now?

40 PROF PITMAN: I think, broadly, figures 19 and 20 would capture the range of uncertainty still.

THE COMMISSIONER: Yes.

45 PROF PITMAN: But I think we've learned, particularly over the last 10 years, of two fundamental mechanisms. One is the tropics are expanding and, secondly, what are called the storm tracks, which are the mechanisms by which large storm systems

flow across the Southern Ocean are moving towards the Antarctic. That tends to drag rainfall bearing systems further south that tends to drive the northern part of the Basin and tends to reduce the probability of rain at the southern part of the Basin. And I don't see any – any mechanism or phenomenon that will increase rainfall over the Basin. I see lots of things that would reduce rainfall. I don't see anything that would increase rainfall.

5  
10 THE COMMISSIONER: Now, that movement, if movement is the right word, relocation, does that comprehend, as it were, what I think of as the monsoons moving south, does it?

15 PROF PITMAN: Not the monsoon systems particularly, although in northern Australia, actually, the expansion of tropics will tend to move some of the Australian monsoon a little bit further south, but not near enough to trigger rainfall in the upper part of the Basin, I don't think. But I think it's fair to say that there has been a suite of mechanisms occurring that all tend to reduce the probability of rain over the Basin by varying degrees and there aren't many mechanisms I can think of that would increase rainfall over the Basin. That doesn't mean there's a catastrophe just around the corner, but it reduces the probability of rainfall over the Basin in general.

20 MR BEASLEY: I'm going to get Professor Pitman to describe or explain El Nino and La Nina to us in a moment. Don't worry. We will get to the Day After Tomorrow, as well .....

25 THE COMMISSIONER: Without the theology, if you don't mind. If I'm reading figure 19 correctly then, taken on an annual basis, in 2030 it was estimated and depicted in 2007 one might expect that the whole of the Basin would be experiencing a reduction in annual rainfall of about five per cent.

30 PROF PITMAN: That was what - - -

THE COMMISSIONER: Between zero and five per cent, I should say.

35 PROF PITMAN: That's what that figure shows, but - - -

THE COMMISSIONER: Right.

40 PROF PITMAN: - - - I think science since then has added detail and texture to that very broad brush.

THE COMMISSIONER: Quite. And I think this document and others that you've drawn to our attention make it quite clear that, as you may expect from a depiction of the whole of the continent of Australia in such a postage stamp size, it doesn't pretend to and must not be read as if it's locally indicative of .....

45 PROF PITMAN: Absolutely not.

THE COMMISSIONER: But, at that general level, I'm reading that correctly, am I, that that yellow colour translates to anything from no change to five per cent decrement?

5 PROF PITMAN: That's correct. That's what that shows. If I may just add a little detail to this, it's not in this report but all of the evidence is pointing to increased evaporative demand over the Basin. We've seen that very clearly this winter.

THE COMMISSIONER: Yes. Yes.

10

PROF PITMAN: Probably several hundred millimetres a year additional evaporative demand. So to keep a zero sum gain across the Basin, you have to find a way to generate a couple of hundred millimetres of additional rain a year.

15 THE COMMISSIONER: How do I translate that to percentages? I'm sorry - - -

PROF PITMAN: It depends where you are in the Basin.

20 THE COMMISSIONER: Yes. Sorry. It depends. Yes. Now, evaporative demand, would I understand it correctly by using the word evaporation?

PROF PITMAN: Yes, basically. So you're drying the Basin out by increased evaporation. To have the same amount of water available, you have to, therefore, substitute that for additional rainfall.

25

THE COMMISSIONER: I can treat evaporated water as gone from possible environmental and consumptive use, can I?

PROF PITMAN: Yes.

30

THE COMMISSIONER: That is, the cycle by which that vapour may one day somewhere be precipitated does not get included in the - - -

PROF PITMAN: That's correct. Yes. It must - - -

35

THE COMMISSIONER: Whatever I think of as the aggregate.

PROF PITMAN: It must precipitate, but it doesn't precipitate necessarily somewhere where you want it to.

40

THE COMMISSIONER: Or when you want it to.

PROF PITMAN: Or when you want it to.

45 MR BEASLEY: I'm sure it's more complex than this, but if the temperatures are warmer with the same amount of rainfall, there will be less run-off?

PROF PITMAN: Correct. Yes.

MR BEASLEY: Correct?

5 PROF PITMAN: To first ..... I can unpack that for hours, if you would like, but keeping it simple, that works.

MR BEASLEY: Well, unpack it a bit. It's because the ground is dryer and there's more evaporation. Is that a start?

10 PROF PITMAN: So if you warm the environment, the atmosphere can hold more water. The amount of water the atmosphere can hold is dependent upon its temperature.

15 MR BEASLEY: Right.

PROF PITMAN: So if you warm the atmosphere, you enable the land to evaporate more moisture into the atmosphere and that dries the land out.

20 THE COMMISSIONER: So that's physics.

PROF PITMAN: That's physics.

25 MR BEASLEY: So that won't change?

PROF PITMAN: No. So, going back to these rainfall maps, zero change in rainfall is not a good news story. If you're losing 200 millimetres a year extra in evaporation, you are still dryer, you still have less soil moisture and you still have less .....

30 THE COMMISSIONER: The expression has been used in a lot of the literature I've read about the drying Basin, looking ahead. I think what you're telling me is that I need to understand that drying does not just mean less precipitation on average. It also means more evaporation on average.

35 PROF PITMAN: Yes.

THE COMMISSIONER: Thank you.

40 PROF PITMAN: Yes. Yes. And if you want a simple analogy, if I double your salary, but quadruple your costs, you go backwards financially. Similar deal with the environment.

45 MR BEASLEY: Don't tell the Treasurer of South Australia, though, but keep going.

PROF PITMAN: So it's just basic accounting. If you increase evaporation and you don't increase the rainfall, you get dryer.

5 THE COMMISSIONER: Why don't reports like this one routinely include not alongside temperature and rainfall – that is precipitation – why don't they include evaporation? Is it because it's expected that half intelligent readers will understand that evaporation is a function of temperature?

10 PROF PITMAN: So, classically, in the climate science community we are interested in energy. Additional ..... generates additional energy. We're interested in how that leads through to temperature. That's what the climate community have been terribly excited about for years. I think, if that that was an implied criticism, I would agree with it. We ought to be - - -

15 THE COMMISSIONER: That was a genuine query. I'm interested in evaporation for obvious reasons.

20 PROF PITMAN: We should be very interested in how energy flows through the system and how water flows through the system, and indeed how carbon flows through the system. And in the last 10 years, if this report was done again, I think evaporation would be part of the narrative, but back in 2007 there was virtually no data on observed evaporation. And this report tried ..... to scaffold its arguments on observations.

25 MR BEASLEY: Was this – the report we're discussing that you were part of, was it before the CSIRO's sustainable yields - - -

PROF PITMAN: Yes.

30 THE COMMISSIONER: Now, forgive my ignorance – well, don't forgive it at all, but I'm about to display it. Please try and enlighten me. Is it the case that with the increased energy that you've just referred to, translated to, in very broad terms, higher temperatures, that more of the planet's water will be in the atmosphere as vapour than in oceans and rivers and groundwater?

35 PROF PITMAN: Yes, but infinitesimally more. So the atmosphere actually holds really very little water.

THE COMMISSIONER: Right.

40 PROF PITMAN: But - - -

45 THE COMMISSIONER: But increased evaporation does mean, at least there and then, that is, at a particular time and place, it means that there will be less liquid water on and below the surface.

PROF PITMAN: Yes. Yes. Yes but we're – but you could warm the atmosphere three degrees and you wouldn't suddenly make the entire planet arid, because the water flows up as increased evaporation must fall back in some way as rainfall.

5 THE COMMISSIONER: Yes.

PROF PITMAN: So there's a classic narrative, which is overly simplistic, which is the dry gets dryer and the wet gets wetter.

10 THE COMMISSIONER: Yes.

PROF PITMAN: So the areas which get very heavy rainfall will get more.

15 THE COMMISSIONER: And that's because they're, as it were, the places where preferentially precipitation occurs?

PROF PITMAN: Precisely.

20 THE COMMISSIONER: And I've said precipitation and these places say rainfall. It includes – I know it doesn't matter in Australia much, but it includes snow, I think?

25 PROF PITMAN: Yes, so classic precipitation is the sum of rain and snowfall, and over Australia, with apologies to the Alps, we don't fuss about snowfall.

THE COMMISSIONER: We don't normally bother about making the note? Yes. Okay.

30 PROF PITMAN: But this would include snowfall.

THE COMMISSIONER: Thank you.

PROF PITMAN: We were trying to use plain language for the politicians.

35 MR BEASLEY: I bet they're really happy about that.

THE COMMISSIONER: That's if they appreciate it.

40 MR BEASLEY: Yes. The CSIRO's sustainable yields project climate change was 2007. You would be familiar with that?

PROF PITMAN: Yes.

45 MR BEASLEY: There hadn't been a huge amount of follow-up with it from that organisation, due to funding issues, no doubt. But that – the projection there were – the median projections were a reduction in total surface water by four per cent, which would lead to a reduced flow in the Murray Mouth by something like 25 to 30 per

cent, and also a reduction in diversions by 2030 of 10 per cent, but possibly by as much as 34 per cent by 2030. Has there been – that was a state-of-the-art best available science in 2007. Has there been any update in relation to that work and have the CSIRO’s projections – are they still considered the most likely scenarios?

5

PROF PITMAN: So, as far as I know there has been no update to that sustainable yields project. I think it was best practice when it was done. Within the confines of, I believe, CSIRO being ..... to do that work.

10 MR BEASLEY: Yes.

PROF PITMAN: These are big challenging projects at the interface of cutting edge science with applying that science into real world problems.

15 MR BEASLEY: Yes.

PROF PITMAN: Trying to do that in a year is a big ask.

MR BEASLEY: Yes.

20

THE COMMISSIONER: I’m absolutely sure if you redid that with best practice now you would get different estimates, but I wouldn’t like to guess whether they were better or worse.

25 THE COMMISSIONER: Yes. So which document was that from?

MR BEASLEY: It’s not – sorry. I was reading from the climate change core materials folder, the CSIRO. I don’t think there’s any need to - - -

30 THE COMMISSIONER: Is that RCE 13?

MR BEASLEY: Yes, it is. Professor Pitman’s familiar with it.

THE COMMISSIONER: That’s all right. No. No. Yes, so am I.

35

MR BEASLEY: I want to take you through some basics of what causes drought or increased rainfall in Australia in a moment, but I want to get to the heart of a particular issue. We’ve, obviously, been discussing the issue of climate change projections. And you’ve expressed the view to me and the view to – in your evidence today that there is a likelihood of increased temperatures in the Basin, which does bring with it real potential of less run-off, etcetera, and that climate scientists have been conservative in relation to projections of climate change. And I think you’ve also expressed the view to me that the climate is actually changing relatively rapidly, because of CO<sub>2</sub> emissions; correct?

40

45 PROF PITMAN: Yes.

MR BEASLEY: I'm not going to ask you to be a lawyer now. I want you to stay being a climate change expert. But the Basin Plan in chapter 4 says that risks have to be – strategies for risks have to be developed, including to improve knowledge of the impact of climate change on water requirements and to improve knowledge on the impact of Basin water resources by the impacts of climate change. That's pretty  
5 much all it says, so it's not exactly useful.

THE COMMISSIONER: So you're quoting there from the Plan.

10 MR BEASLEY: I'm quoting from chapter 4 of the Plan.

THE COMMISSIONER: It's only slightly longer than item 6 of section 22 which required it to be done.

15 MR BEASLEY: Yes. Yes. I know – I'm going to ask you about this later about the relative lack of funding for climate change research and the concerns you have there. You know that the – in setting the long-term average sustainable diversion limit for the Basin Plan, climate change projections weren't used at all. Having taken you to that chapter in the Basin Plan – and, again, I'm still not asking you to be a lawyer.  
20 I'm just giving you the context. The Water Act, first of all, in section 21(4)(a) says that the Authority must take into account the principles of – doesn't need to see:

*Must take into account the principles of ecologically sustainable development.*

25 You would be familiar with that concept?

PROF PITMAN: I am.

MR BEASLEY: But also must act on – not take into account, act on the best  
30 available science. Now, I want to put this scenario to you. The MDBA is an organisation that is charged with, amongst other things, producing a sustainable diversion limit for the Basin in terms of the use of the water resources. So how much water will be available for consumptive use versus how much water the environment needs so that key environmental assets, key ecosystem functions and the like are not  
35 compromised, in other words not endangered. So that's the task they've got. And there's \$13 billion of public money tied up in this task. And so they have to work out how much water is needed, not only to not compromise the key environmental assets, but also to fulfil our international obligations under various treaties, which may involve an element of protecting and restoring degraded environmental assets  
40 like wetlands, etcetera. And, as I said, they have to do that bearing in mind, at least, ecologically sustainable development and they have to act on the best available science.

45 But the approach they took – and I apologise. This is closer to a submission than a question, but I will get to the question part. I'm just giving you the context. The approach the Basin Authority took was, "We will, for the purposes of setting our SDL, completely ignore climate change projections." And, instead, they've acted on

what I would call statistics. That is, the statistics of inflows into the Basin from 1895 to 2009. Now, I'm going to give you my view and then I want you to express your view, whether you agree with it or not, and use your own words. These are going to be mine.

5

The submission I'm going to end up making to the Commissioner is that, first of all, climate change projections and climate change science are part of the best available science we have now. That's the first point. The second point is that in setting a sustainable diversion limit for the future use of the Basin's water resources, in my submission, it's absolutely critical that climate change projections be incorporated. In fact the submission I'm going to make is it's madness not to, and it's certainly not acting on the best available science. And I was interested in your military planning scenario you gave us, where worst case scenarios are actually factored in and all things like that are factored in.

15

Can you give the Commissioner your view as to whether the best available science is being ignored by ignoring climate change projections, and (2) do you believe it's critical in relation to setting a sustainable diversion limit that climate change projections are taken into account, rather than just looking at historical data from 1895 to 2009, which I'm sure back in 1900 there was a lot less carbon dioxide in the atmosphere.

20

PROF PITMAN: So I can unpack those questions a little bit. There's a really famous paper published in the scientific literature by one of the gurus of large-scale hydrology, which is kind of what you're talking about here called Stationarity is Dead. And in that paper they, basically, point out that any decision-making based on historical data under a climate change scenario makes no sense.

25

THE COMMISSIONER: Did you say stationarity?

30

PROF PITMAN: Stationarity.

THE COMMISSIONER: It's a wonderful word.

35

PROF PITMAN: It is. It's a really good paper, as well. It's the notion that - - -

THE COMMISSIONER: Yes, I understand.

40

PROF PITMAN: So the science around temperature changes, the consequence of that on evaporation, the consequences of emerging new environments around heatwaves, for example, the change in the seasonality of the climate, warmer, clearer, dryer winter for instance, these things are really robust in the science and to not take those things into account doesn't make any sense to me, except that I think there are fundamental questions about the viability of the Murray-Darling Basin if you do so. And generally planners don't like scenarios that they can't manage moving forward. And I think there are some significant questions about the viability of the Basin.

45

MR BEASLEY: Is this, “You can’t handle the truth”?

PROF PITMAN: Yes.

5 THE COMMISSIONER: When you say the viability of the Basin, do you mean the viability of the Basin Plan?

MR BEASLEY: No.

10 THE COMMISSIONER: You mean the viability from the - - -

MR BEASLEY: A productive Basin.

PROF PITMAN: As an economic powerhouse of agriculture in Australia - - -

15

THE COMMISSIONER: Thank you.

PROF PITMAN: - - - I think the long-term viability of the Basin, without some really difficult decisions being made about what use, what agriculture can and can’t take place in that Basin, about the amount of water being drawn for multiple purposes, it really needs a look at that Plan in the context of the modern climate and the climate that is coming as a really major foundation for that planning process.

20

THE COMMISSIONER: Now, when you talk about a dislike, if you like, a bias against scenarios that they can’t manage, you conjure up in my mind the notion of water managers, resource managers in this country preferring to believe that there will not be material differences from, say, the last century over the next century.

25

PROF PITMAN: Yes. I think that’s exactly – entirely true.

30

THE COMMISSIONER: As I understand it – and you’ve used the epithet robust. As I understand it, almost regardless of where you look for the science or who does the science, there is a common theme, subject, of course, to data differences – there is a common theme that there will be change. Question, when and how much?

35

PROF PITMAN: There will be change. It will be warmer.

THE COMMISSIONER: Yes.

40 PROF PITMAN: And - - -

THE COMMISSIONER: So there will be change, it will be in the direction of warmer, which in Australia probably translates for most of the land surface in question to dryer, as well. Yes.

45

PROF PITMAN: Correct. And, in effect, by not taking that into account, the planners assume, somehow, the rainfall will increase to compensate for those changes.

5 THE COMMISSIONER: Well now, it's true, isn't it, that in some parts of the world it is projected, on relatively robust scientific bases, that increased warmth will make it wetter?

PROF PITMAN: Yes.

10

THE COMMISSIONER: Yes. But, alas, that's not this country?

PROF PITMAN: No.

15 THE COMMISSIONER: Except, perhaps, for some parts of the north.

PROF PITMAN: Yes.

20 THE COMMISSIONER: Which may stray into the northernmost extremity of the Basin.

PROF PITMAN: It may, yes.

25 THE COMMISSIONER: And your gesture which can't be transcribed means maybe, maybe not?

PROF PITMAN: I don't know.

30 THE COMMISSIONER: Yes.

PROF PITMAN: And nobody would be able to judge that. It's a fairly fine line as to whether it would or it wouldn't.

35 THE COMMISSIONER: Thank you. Now, Mr Beasley has been careful to warn you against taking up law as a career in the witness box. And I should repeat that, but you would probably be aware, but let me tell you anyhow, that as a matter of law that Parliament has required those who manage water under the Water Act and through the Basin Plan to address the risks of climate change and have done so by wording, the detail of which is not relevant to my questions to you. Do I understand  
40 your last couple of answers as really amounting to this: the preference or bias expressed by proceeding as if things aren't going to change is fundamentally at odds with, totally contrary to, addressing risk, even accepting that there may be multifarious ways, all subject to reasonable argument, about how to address the risk?

45 PROF PITMAN: I think that's almost by default.

THE COMMISSIONER: It's really elementary, isn't it?

PROF PITMAN: It is, yes.

THE COMMISSIONER: Well now, what, however, do you say about this. Assume that the managers are entitled as a matter of law to look out only 10 years ahead.

5 Now, just take that as an assumption, even if you think that must be crazy policy. Could one acknowledge the risk of climate change, that is, the chance, say, that the Basin will dry, but simultaneously and with, so far as you're concerned, some semblance of scientific respectability, say, but over 10 years no more need be done than we ordinarily do to reflect the particular season's precipitation in the amount of  
10 water we allow to be taken consumptively?

PROF PITMAN: So the way the regional climate of the Murray-Darling works is with a very high degree of inter-annual variability, year to year variability - - -

15 THE COMMISSIONER: Yes.

PROF PITMAN: - - - the contribution that elevated CO<sub>2</sub> and the associated climate changes makes on a time scale of 10 years is not huge. Normally. There are exceptions to that. And south-west Western Australia appears to be an exception to  
20 that, but generally speaking, on a time scale of a decade, the driver of change is variability. And the impact of CO<sub>2</sub> on that ..... time scale is relatively small.

So if you drew a strict line in your planning for something the scale of the Basin that you will not look beyond 10 years and will only come up with plan on a 10 year time  
25 scale, the role of climate change driven by CO<sub>2</sub> on a 10 year time scale should not normally be transformative. Of course, something of the scale of the Basin and something of the scale of the significance of the Basin, planning on a 10 year time scale is just not compatible with the best science. But if they are limited to thinking  
30 10 years ahead, then climate change is going to rarely be a major driver on that time scale, I suspect.

THE COMMISSIONER: Of course, as a matter of both science and policy, I hope the two aren't completely distinct.

35 PROF PITMAN: You would hope so.

THE COMMISSIONER: If you took a decade by decade approach, then you would be facing the same weird approach at the beginning of every decade, that is, "I don't  
40 have to worry about this for the next 10 years."

PROF PITMAN: That's right.

THE COMMISSIONER: And repeat that again 10 years later.

45 PROF PITMAN: Exactly.

MR BEASLEY: But, also, the 10 year reconciliation, if you want to call it that, doesn't address the question whether you should have taken into account climate change projections when you first set the SDL.

5 THE COMMISSIONER: That's right. But that's why I stress that – and Mr Beasley and I are testing some ideas legally. We're not asking you to comment on the law. And I put to you assumptions which, I should be frank with you, I think are probably wrong, but they are assumptions that some people seem to have made about this Plan.

10

PROF PITMAN: I will just introduce you to the concept of abrupt climate change.

THE COMMISSIONER: Is this some kind of step change, rather - - -

15 MR BEASLEY: You mentioned south-west Western Australia. It stopped raining in Perth in the mid-70s, rather dramatically and suddenly, didn't it?

PROF PITMAN: Well, not quite. In south-west Western Australia the rainfall dropped quite dramatically and everyone thought, "That's okay." You know, it's  
20 going to stay – rain this much definitely. And then a few years later it dropped dramatically again, and then it dropped dramatically again. And - - -

MR BEASLEY: Now they've got three desalination plants?

25 PROF PITMAN: Exactly. Climate can change very rapidly, very abruptly, and that is something that is very difficult to adapt to and is very hard to build up resilience to. So you're looking at a risk perspective over the Basin, the impact of a long-term gradual increase in CO<sub>2</sub> translated through classical climate science wouldn't give you major cause for concern on a 10-year time scale. But superimposed on that is  
30 emerging science around how climate can change dramatically and rapidly.

THE COMMISSIONER: Step changes?

PROF PITMAN: Absolutely Day After Tomorrow scenarios.

35

MR BEASLEY: I don't know that the Commissioner is familiar with this.

THE COMMISSIONER: I gather it's a reference to popular culture. So I'm not familiar with it.

40

MR BEASLEY: It rates just behind Casablanca as one of the great films of all time.

THE COMMISSIONER: Casablanca is a ..... about North Africa, is it?

45 MR BEASLEY: I raised it because the professor told me he set a question for his students on it. So we're going to get to it in detail eventually.

PROF PITMAN: So climate can change abruptly, and it does change abruptly and  
- - -

MR BEASLEY: Has it changed abruptly in California?

5

PROF PITMAN: That's a really interesting question, and there are – so the problem with abrupt climate change is if rainfall suddenly drops 50 per cent, it happens rapidly over two or three years, and everyone says - - -

10 THE COMMISSIONER: It's a drought.

PROF PITMAN: It's a drought. Now, that drought can last 600 years, or it might break next week. You classically need, in climatology terms, 30 years of data before it's a climate.

15

THE COMMISSIONER: Thank you.

PROF PITMAN: And - - -

20 MR BEASLEY: I asked because the state always seems to be on fire every time I look at the news and always in drought.

PROF PITMAN: Yes. California has been in an extraordinarily long drought, and whether that's a climate change signal or whether that's natural variability is  
25 arguable, but in the same way as if it gets hotter, you suck more moisture out of the landscape, that has been happening over California. That means it's drying, and it's very hot, and the winds have been very strong, and the stress on the vegetation for years has led to the trees being vulnerable to infestation by beetles, which has killed them. So you suddenly get very hot, very dry, very windy with a huge amount of  
30 fuel load.

THE COMMISSIONER: So the kind of – the concept of resilience and buffering so-called to produce resilience in non-drought times in order to contribute to one of the possible strategies to address climate change in the Basin has in mind that  
35 literally the physical condition of your macro vegetation, as you go into a dryer period, can conduce to a better outcome?

PROF PITMAN: Yes.

40 THE COMMISSIONER: Thank you. It doesn't sound all that much more complicated than if I am facing famine, I had better have a bit of weight on before I go into it?

PROF PITMAN: Yes. No. So most of Australia's vegetation, particularly the  
45 eucalypts are incredibly resilient to drought, but they have their limits. And one of the ways that eucalypts withstand drought is by putting their roots down 30 metres to groundwater. One of the fastest ways to make a large ecosystem vulnerable is to find

ways to drop the groundwater a few metres. So one of the things that's happening by tapping groundwater for irrigation is you make your ecosystems vulnerable when a drought comes.

5 THE COMMISSIONER: Is that because many of the vegetable species have roots that can't then chase the groundwater?

PROF PITMAN: Eucalypts have spent - - -

10 THE COMMISSIONER: Eucalypts can but there's lots of other - - -

PROF PITMAN: Different vegetation has different strategies, for instance grasses  
- - -

15 THE COMMISSIONER: You make it more fragile because you deprive the grass of more water.

PROF PITMAN: No, you make the forests much more vulnerable because you  
20 deprive them of access to groundwater. Grass is okay because they recede annually with seed. If you hit grasses with long-term drought, the seeds stay dormant and can grow when it rains. If you kill eucalypts, they don't grow very well.

THE COMMISSIONER: Yes.

25 MR BEASLEY: New South Wales is in drought at the moment, to the extent we now have a Drought Envoy. I'm not sure he's going to be able to make it rain, but  
- - -

30 THE COMMISSIONER: I think the country has a Drought Envoy; it's not New South Wales.

MR BEASLEY: You're right. Thank you for that, and I'm feeling better already that it's nation-wide.

35 THE COMMISSIONER: That's right.

MR BEASLEY: One of the interesting things you've told us about this current  
40 drought, I had always understood, with my lack of knowledge, that drought was associated with El Nino. We're not in an El Nino cycle, I think, at the moment which makes this current drought slightly unusual.

THE COMMISSIONER: Make your answer as long as you like.

45 MR BEASLEY: I'm inviting your – I'm inviting an answer.

PROF PITMAN: I have a flight at 5 o'clock. So drought in Australia is often characterised by people's understanding of El Nina, La Nina .....

MR BEASLEY: You're going to have to explain those terms for the transcript.  
Thank you.

5 PROF PITMAN: So there are modes of variability in the earth's climate. There are many modes of variability. All that means is classically in the ocean, the ocean forms patterns of temperature that get expressed at the surface as temperature anomalies, and as temperature anomalies translate into the atmosphere to cause patterns of circulation with particular characteristics.

10 MR BEASLEY: Is that an oscillation index? Yes.

PROF PITMAN: Yes, so El Nino La Nina cycle between El Nino and La Nina, but there are many other modes of variability. There's the Indian Ocean dipole which is characterised by a cycle of about a 10 to 20 year time scale.

15

MR BEASLEY: So am I right – the variability between El Nino and La Nina accounts for about.

20 THE COMMISSIONER: La Nina.

20

MR BEASLEY: Sorry.

THE COMMISSIONER: It's all right. Don't worry. So - - -

25 MR BEASLEY: Accounts for about 30 per cent of rainfall variability?

PROF PITMAN: In south-east Australia.

30 MR BEASLEY: In south-east Australia. So there's 70 per cent caused by something else.

PROF PITMAN: That's right. So El Nino and La Nina has about a three to five year cycle, and over south-east Australia, that explains approximately 30 per cent of the rainfall variability. The Indian Ocean dipole has approximate 10 to 20 year periodicity. We can only be approximate on that because you've got 100 years observations, and if something has a periodicity of 20 years, we don't have enough data to be absolutely certain. Whereas if you have something of a five to seven year cycle, you have many more expressions of that to be a lot more confident about the time scales over which it operates.

40

MR BEASLEY: When we're in a El Nino cycle and there is – and it's causing drought, why is that?

45 PROF PITMAN: So during El Nino, you've got warm sea surface temperatures in part of the Pacific.

MR BEASLEY: Yes.

PROF PITMAN: That leads to a cycle in the atmosphere which tends to be associated with ascending air over South America flowing across the Pacific at altitude and descending over Australia.

5 MR BEASLEY: Which means a lack of rainfall?

PROF PITMAN: That's correct.

10 MR BEASLEY: And is that why the Sahara is dry because it's in that descending air area?

PROF PITMAN: ..... circulation.

15 MR BEASLEY: Yes.

PROF PITMAN: Not of El Nino.

MR BEASLEY: No. Understood.

20 PROF PITMAN: So there's lots of these big cycles.

MR BEASLEY: Yes.

25 PROF PITMAN: If you heat the atmosphere in the tropics, the air rises up to high altitude, it spreads out at a high altitude, and it descends somewhere, and it classically descends at about 30 degrees north and south which is where the Sahara is.

30 THE COMMISSIONER: And what's the connection between its descent and precipitation?

35 PROF PITMAN: Okay. So in order to get precipitation, you have to cool the atmosphere. You can cool the atmosphere by pushing the atmosphere up the side of a mountain, or in a frontal system where air gets pushed up at the front of the front or a large-scale cycle of the atmosphere. So if you push the atmosphere up, it cools.

THE COMMISSIONER: So all other things being equal, the mere ascent of a body of air will cool it - - -

40 PROF PITMAN: Absolutely.

THE COMMISSIONER: - - - and conduce to condensation.

45 PROF PITMAN: That's correct, yes.

THE COMMISSIONER: And so when this warmed air rising near South America is, what, jet streamed to Australia?

PROF PITMAN: Yes, basically.

THE COMMISSIONER: And falls over Australia, it is relatively warmer air, hence  
- - -

5

PROF PITMAN: Warm and dry.

THE COMMISSIONER: Warm and dry, hence reducing condensation possibilities  
and therefore reducing rainfall?

10

PROF PITMAN: I mean, basically the rainfall falls over the Pacific.

THE COMMISSIONER: Have I misrepresented it too much?

15 PROF PITMAN: No. That's right. And the rainfall is over the Pacific during an El  
Nina, whereas during a La Nina, the very warm temperatures tend to be in the  
tropical north of Australia. Those very warm temperatures dry the atmosphere  
vertically. That generates a huge amount of moisture at altitude, and there is  
20 basically mechanisms by which that very deep convection or that very high uplift in  
the tropics moves, anticlockwise around the continent to increase the probability of  
precipitation over south-east Australia.

THE COMMISSIONER: And, what, it moves towards the pole as well, doesn't it?

25 PROF PITMAN: It's sort of – the very large amounts of moisture that have been  
brought up into the high altitudes over northern Australia flow initially westward and  
then southward and are swept back along the southern part of the continent with very  
warm moist air with high probability of precipitating over south-east Australia.

30 MR BEASLEY: All right. So El Nino – you've described how it's associated with  
a reduction in rainfall and potentially drought. It can also be associated with an  
increase of rainfall with other conditions, and is that where the Indian Ocean dipole  
comes in?

35 PROF PITMAN: So I think El Nino in a general sense tends to reduce rainfall over  
south-east Australia, but the Indian Ocean dipole is associated with very cold  
temperatures, very cold ocean temperatures surrounding Australia.

MR BEASLEY: You had better tell us what the Indian Ocean dipole is as well.

40

PROF PITMAN: So it's a mode of variability.

THE COMMISSIONER: What's it – why is it called dipole?

45 PROF PITMAN: Because it has got two oscillating states. You could have called  
the El Nino a dipole.

THE COMMISSIONER: Yes.

PROF PITMAN: But because it was named in the 1700s, they didn't use proper terminology.

5

THE COMMISSIONER: Yes.

PROF PITMAN: So the Indian Ocean dipole is just an oscillation between a very strong positive and a very strong negative phase. When it's at a positive phase, you have very cool temperatures over the Tasman, over tropical north. That tends to an air flow across the continent from the south-east towards the north-west, bringing moist air up over the continent and increasing the chance of rainfall. In a negative phase, it tends to push the atmosphere from around the Indian subcontinent, and across the continent, it tends to be dry air by the time it gets across to south-east Australia, and it tends to not bring moisture across Western Australia and across the southern states of Australia.

THE COMMISSIONER: Now, I apologise if this is altogether too naive to admit of an answer, but can you explain in terms of the El Nino, La Nina and the Indian Ocean dipole and their behaviour what it is supposed that climate change will do to them?

PROF PITMAN: No.

MR BEASLEY: I thought that sounded like a really easy question. I'm disappointed with your answer.

PROF PITMAN: So there is evidence from some climate modelling experiments of the increased possibility into the future particular flavours of El Nina. There are different brands of El Nina, and there's a particular brand which is commonly associated with droughts over south-east Australia that some people think will intensify in the future. But I think the science around predicting how these modes of variability will change in the future is very limited, and I think guessing what will happen to those modes of variability - - -

35

THE COMMISSIONER: You're still guessing.

PROF PITMAN: - - - is very much beyond our current modelling capability.

THE COMMISSIONER: But that doesn't detract, I gather, from the certainty, to use your word, with which we can foresee climate change of a drying kind.

PROF PITMAN: Warming kind.

THE COMMISSIONER: I'm so sorry. Of a warming kind.

45

PROF PITMAN: That's correct. So this comes back to that risk framework. If under climate change you got a permanent positive Indian Ocean dipole and a permanent La Nina, then it is possible, I think, that you would get considerably more precipitation over the Basin. The odds of that happening are unknown, but you  
5 would have to have multiple ducks line up, all at the right time, and for what it's worth, the consequences of that would be really quite catastrophic on other systems around the world that don't benefit from La Nina, don't benefit from the positive modes of Indian Ocean dipole. For example, the positive modes of the Indian Ocean dipole is characterised by drought over India.

10 THE COMMISSIONER: Yes.

PROF PITMAN: So you would end up with a billion people in permanent famine which isn't a good outcome. So there are scenarios at the tails of distribution that the  
15 low probability sets of circumstances that could come to pass.

THE COMMISSIONER: The things that most likely won't happen, but might happen.

20 PROF PITMAN: That's correct. That would lead to significant more rain over the Basin. But there are more plausible scenarios and more likely scenarios at the opposite extreme where the rainfall over the Basin became substantially less than we have seen over the last 10, 20, 30 years. Putting probabilities on those things is really hard, and I wouldn't want to try and do that. But building those into your  
25 planning scenarios would seem to me to be classic risk management, and I don't understand why we don't do that. The emergency services do plan for low probability, high outcome events.

30 THE COMMISSIONER: That's because burning cities is such a bad outcome that you are interested prudently in addressing even low probability possibilities.

PROF PITMAN: So I think the short story is we plan very well for things that will happen on a specific government's watch. Whereas what we're talking about here is a slow – relatively slow burn.  
35

THE COMMISSIONER: This is the three or four year period, this is the theory of risk management.

40 PROF PITMAN: That's correct.

MR BEASLEY: The temperature extremes in Europe this year would have been low probability if it was modelled a few years ago, I take it.

45 PROF PITMAN: I have had a conversation with my state government around this summer because every single duck is lining up for a catastrophe.

THE COMMISSIONER: Time for a tinder box headline then?

PROF PITMAN: But to be fair to my state government what does a government do if it has left it until the October - - -

THE COMMISSIONER: Yes.

5

PROF PITMAN: And, in fact, my state government hasn't left it until October because I think the emergency services across my State just get this and have been planning for it with skill and diligence.

10 MR BEASLEY: I smelt smoke the other day in Edgecliff. So - - -

THE COMMISSIONER: Just to be clear, the fact that what I hope won't happen but might happen, there's catastrophic fires in what's my state as well, this year won't mean it is not low probability if it had been low probability. I mean, low probability things occur.

15

PROF PITMAN: Yes, of course. But - - -

THE COMMISSIONER: But I'm interested in your comments on the way in which one would improve knowledge of the impact of climate change or improve knowledge of the impact on Basin water resources of climate change. I've there quoted from the language of the Basin Plan with one of the – if I might put it this way, more concrete of the very few strategies that are set out in its chapter 4 as required by the Water Act in addressing strategies to address the risk of climate change. One way, I gather from what you've told me is of improving knowledge of things that haven't yet happened, the future, is more or less continuously to ensure that appropriately skilled people are thinking about, contesting, debating, refining data collection, data analysis, modelling and projections; isn't that right?

25

30 MR BEASLEY: Can I just - - -

THE COMMISSIONER: No.

MR BEASLEY: I was just going to give some more context to your question that I think is important.

35

THE COMMISSIONER: Sure.

MR BEASLEY: Hearing what the Commissioner has just asked you, the context for the question I think should have this added to it, that the Commissioner was also talking about the fact that there's a reconciliation for the Basin Plan in 2024, and the MDBA is very keen on putting out statements that if they've got their adjustments or amendments wrong, don't worry about it, we will fix it all up in 2024. I think – and you've also said that you think scientists are perhaps not great at telling people how fast the climate system, including in the Basin, might be responding to CO<sub>2</sub> emissions. In that total context, to actually plan for climate change requires ongoing research and funding for ongoing research?

45

PROF PITMAN: It needs two things. In the same way as in weather forecasting, there's ongoing research, but there is also an operational system that runs once or twice a day to produce your forecasts. It is overseas basins of the scale of the Murray-Darling, give or take, have integrated modelling systems built for them that take into account the management of the Basin, the nature of the landscapes, the topography, and climate change, all integrated into how that basin is managed. When CSIRO did the sustainable yields project, they, in my view, produced a really nice foundation which should have triggered the development of an operational system for the Murray-Darling with strong research themes building into that operational system. If that had been done, you would have been able to quite straightforwardly update the information context around the Plan on an annual basis, gradually evolving the nature of that advice, consistent with the best science, and it would just become part of the infrastructure to manage the Plan.

15 THE COMMISSIONER: So the model, as it were, I might call it self-correct. That's too strong a word, but it would be a continuous learning and improvement.

PROF PITMAN: That's right.

20 MR BEASLEY: Further informed.

PROF PITMAN: Exactly. Yes. That's correct. Exactly how you've - - -

25 THE COMMISSIONER: Which is what models are for, isn't it?

PROF PITMAN: That's exactly right. You don't allow your models to prescribe your policy response, but you should ensure that modelling is a component from which you develop your policies. The - what I've just described is not rocket science. When CSIRO did the - - -

30 THE COMMISSIONER: Sounds more difficult, frankly.

PROF PITMAN: Sorry.

35 THE COMMISSIONER: It sounds more difficult than rocket science.

PROF PITMAN: When CSIRO did the Murray-Darling Plan - sorry, when they did the Sustainable Yields Plan, they brought together expertise across climate signs, hydrology, couple of other areas and did a good job, but science has moved on a long way in that 10 or so years. Redoing that now would be as hard as doing it from scratch because everything has evolved so substantially, and it's not something that you could do by the end of next year. The - - -

45 MR BEASLEY: You've got to get a team together, for a start.

PROF PITMAN: The expertise has been lost in the country that did the sustainable yields work.

MR BEASLEY: Well, why has the expertise been lost?

PROF PITMAN: Frankly CSIRO and the bureau aren't funded to do research on it.

5 THE COMMISSIONER: It's the old story of what they call resources.

PROF PITMAN: Yes.

10 THE COMMISSIONER: Apparently the Australian Government don't have any money from what people are telling me. In any event, I want to ask then, from what you've just described, you really won't improve knowledge. Those are the two words in the plan, you really won't improve knowledge about the impact of climate change unless you have in place, as you say, as part of the infrastructure a – what I will call a permanent unremarkable, because it's obvious that one needs to have it, 15 resource intellectually, either in-house or outhouse or preferably a beneficial cooperation collaboratively, of appropriately skilled and remunerated and resourced people to update, one hopes to improve, the capacity to understand the challenges just ahead and further ahead in relation to the drying Basin; is that right?

20 PROF PITMAN: Yes.

THE COMMISSIONER: Now in a sense, I know you've been saying this – I do apologise if it frustrates you. In a sense, this is the bleeding obvious, isn't it?

25 PROF PITMAN: The – I'm not - - -

MR BEASLEY: That's why I described .....

30 THE COMMISSIONER: You are, if I may say so, part of the relevant establishment and so – and I'm not. Can you give me some insight as to how it is culturally or otherwise, that – administratively, I don't know – how it is that we've got to a point where, as you say, we now don't have the time and the resources – that we don't have the teams ready to go on this?

35 PROF PITMAN: So when the sustainable yields plan was done by CSIRO, I believe they were given a year. That meant they could basically do a meta-analysis of the available data. They didn't do any new science in order to do that; they just collected together the information that existed and did a good synthesis of that and that evidence. And I think then government thought, "Good. It's done".

40

THE COMMISSIONER: Well now, if I'm just looking at - - -

45 MR BEASLEY: Can I just give more context to that Commissioner. I keep reminding myself of things in this Water Act, relevant for the discussion you're having with Professor Pitman now. You've been referring to chapter 4 of the Basin Plan as I did about the risk of – risk strategy of improving knowledge of the impact of Basin water resources and climate change. I'm reminding myself that section

22(3) of the Act actually makes it a mandatory part of the plan to identify the risks to the Basin water resources of the effects of climate change.

5 THE COMMISSIONER: No. I know. That's the - - -

MR BEASLEY: I mean, that's not what chapter 4 is doing. It's not even getting close to it.

10 THE COMMISSIONER: But if you look at item 6, you will find that chapter 4 is intended to be an answer to that.

MR BEASLEY: Yes.

15 THE COMMISSIONER: And that's – in a – in – you've got a folder there, climate change core materials or not?

MR BEASLEY: I'm not sure that the witness does.

20 THE COMMISSIONER: You're about to have it.

PROF PITMAN: No.

25 THE COMMISSIONER: If you just turn to tab 1 in that, you will see the CSIRO's report to the Murray-Darling Basin Authority of July 2009?

PROF PITMAN: Yes.

30 THE COMMISSIONER: It's designated BP01 in what's called the MDBA technical report series, and I'm hoping that 1 with two digits means it's looked forward that there will be many more. It's entitled Advice on the Climate Scenarios for Use in the Murray-Darling Basin Plan Modelling.

MR BEASLEY: I think that's tab 2, not tab 1 for the witness.

35 THE COMMISSIONER: Is it?

MR BEASLEY: Yes.

40 THE COMMISSIONER: Are you sure?

MR BEASLEY: Well, you know, it's tab 1 in mine, but that doesn't mean it's tab 1 in everyone's.

45 THE COMMISSIONER: It doesn't have the barrage, it has the - - -

PROF PITMAN: That one?

MR BEASLEY: No. That's the – yes, that's the one.

THE COMMISSIONER: Tab 1.

5 PROF PITMAN: Tab 1.

MR BEASLEY: I've been misled again. I need another memo to staff.

10 THE COMMISSIONER: If you turn to page 14, please. You will see there some advice given by the CSIRO to the Authority under the heading of climate sequences over the period of implementation of first Basin Plan present to 2024. And then the very last couple of sentences on that page says:

15 *Current research efforts in Australia is based on the extension of the predictive ocean atmosphere modelled for Australia seasonal climate prediction system in the centre for Australian climate research and the Bureau of Meteorology water division and south-eastern Australian climate initiative for water related applications.*

20 Pausing there. Were they – was that more or less state of art at the time for - - -

PROF PITMAN: Yes.

25 THE COMMISSIONER: - - - the kind of exercise that CSIRO was undertaking?

PROF PITMAN: At the time, that would have been fairly – yes.

THE COMMISSIONER: But even at the time, they go on and add:

30 *However –*

a word which ordinarily means to a reader who is not comatose something you should attend to:

35 *However –*

they say:

40 *...there is a considerable amount of research that is required before the predictive ocean atmosphere model for Australia can be used for medium term five to 10 years forecasting.*

PROF PITMAN: Yes.

45 THE COMMISSIONER: Would you agree with that as being a proper statement for the CSIRO to have made back in July 2009?

PROF PITMAN: Yes. But I need to just communicate with you some key language in those sentences - - -

THE COMMISSIONER: Please. Please.

5

PROF PITMAN: - - - which may be opaque.

THE COMMISSIONER: Please.

10 PROF PITMAN: Forecasting is about advising somebody of what is going to happen.

THE COMMISSIONER: Yes?

15 PROF PITMAN: So forecast for Saturday, you expect it to be right. It's what's called an initial value problem. So if you have a good enough set of observations at the beginning of your forecast, you can do a really, really good forecast for periods of time into the future. This is about actually what will happen, whereas that is not what climate change projections are about. Climate change projections are about the probability of future states. Forecasting is about what the actual state is going to be.  
20 So the grand challenge in my field is what's called the cable prediction. It is can we say anything about what the next five to 10 years will be like as a forecast as distinct from a range of probabilities around a projection.

25 THE COMMISSIONER: If you're looking at strategies for managing climate change for a Basin Plan expiring in 2024, though, forecasting is part of the exercise, is it not?

PROF PITMAN: Yes, but it may not be physically possible.

30

THE COMMISSIONER: No. Quite.

MR BEASLEY: Look at the paragraph before though, that's where the CSIRO is directing the Basin Authority to take into account future.

35

THE COMMISSIONER: But all of this rather suggests, not least because of your last comment about what may not be possible, that a prudent organisational response to that kind of advice would be to ensure that one way or the other there were overt deliberate attempts to improve knowledge.

40

PROF PITMAN: So I can't remember what the net economic value of the Basin is to Australia. It's a big number.

THE COMMISSIONER: Yes, it is?

45

PROF PITMAN: The cost of building and maintaining within the Bureau or CSIRO of a properly managed forecast/projection system for the Murray-Darling would be a couple of million a year.

5 MR BEASLEY: It's a \$13 billion Plan.

PROF PITMAN: I can't do that math in my head, I should be able to, but it's an infinitesimal amount of money given the economic value of the Basin to have an integrated system which allows the best science to be fed into the strategies for the  
10 Plan. Now, there are - - -

THE COMMISSIONER: I take it that's an agreement. It would not only have been prudent but it would not have been very expensive either.

15 PROF PITMAN: No.

THE COMMISSIONER: Thank you. That's what you mean?

PROF PITMAN: Yes. But what you will find is if you make findings to say not  
20 enough science is being done or whatever, people will be able to find many, many, many bits of work, little tiny pieces of the jigsaw that they will show you to say "See, we did take the science into account." There is a world of difference between whole little bits of a jigsaw puzzle that characterise little bits of the problem and a properly managed integrated approach with all of the various components brought into a  
25 system to inform the management of the plan. What I'm saying is you need an integrated system with that objective, not claim little bits of work, some of which I did, some of which other people did, don't claim that that is the science you need to fully understand how the Basin will change.

30 THE COMMISSIONER: And this is perhaps where the scientists and the lawyer briefly intersect, because what the law requires is that there be a strategy – that's the word – a strategy to improve knowledge of etcetera. And I translate your last answer in these terms as raising the question with some ..... as to whether one could consider as a strategy waiting to read from time to time what gets bowled up by others  
35 fortuitously in relation to this subject matter, whereas a strategy to improve knowledge actually will involve planning and steps either to undertake yourself or to foster, sponsor, collaborate and organise others to do it, surely?

PROF PITMAN: Absolutely. But the – in my field, as far as I know, the only  
40 properly fully connected strategy is the Act that established the Bureau of Meteorology which requires them to generate the best forecasts that they can over Australia. So everything becomes joined up as a consequence of that and it's all integrated and it's properly managed. Unless you have that formal structure it's possible to provide evidence that you've got a strategy, there might even be  
45 documents that imply you have a strategy, but that full process by which you roll out a strategy best informed by the science with the necessary resources doesn't occur.

MR BEASLEY: And it should be ongoing. It should be ongoing in terms of continually informing the people who are making decisions about the Basin Plan and the delivery of environmental water etcetera, etcetera?

5 PROF PITMAN: As is the weather forecast systems in Australia.

MR BEASLEY: Yes?

10 PROF PITMAN: Operational, ongoing. No government is going to say, “Actually, we won’t bother to do weather forecasts anymore”, because my aeroplane won’t be able take off if there’s no forecast, it’s all integrated into a properly constructed strategy. If you really want to know how to manage the Murray-Darling and you think climate is important to it, you have to build climate into an over-arching strategy that brings the best science and the best operational modelling to the table  
15 and that’s not the way it has been done.

THE COMMISSIONER: We had better take a break in a moment. In section 120 of the Water Act there are so-called additional functions of the Bureau of Meteorology, that is additional to those under the Meteorology Act, and one of them  
20 is providing regular forecasts on the future availability of Australia’s water resources. I know it uses the word “forecasts” and I understand the caution you’ve expressed to me about differentiating between that and climate change projections.

25 MR BEASLEY: That would be about using the water each year I think.

THE COMMISSIONER: ..... regular forecasts on the future of availability of Australia’s water resources, just as a matter of English seems to me actually to encompass projections of climate change, doesn’t it? It’s not a weather forecast, it’s a forecast on the future availability - - -  
30

MR BEASLEY: Are you able – now being asked to engage in statutory construction.

35 PROF PITMAN: I was asked to not be a lawyer.

THE COMMISSIONER: You correctly informed me that in your world the word “forecast” is almost a term of art which differentiates itself from climate change projections?

40 PROF PITMAN: Mmm.

THE COMMISSIONER: Put it this way, if that part of section 120 doesn’t include assembling material concerning climate change projections then there doesn’t seem to be any function of the Bureau to do so?  
45

PROF PITMAN: So the Bureau is very much split between what I would call physically based forecasting systems, which is their weather forecasting.

THE COMMISSIONER: Yes?

5 PROF PITMAN: And what I would call regression based forecasting which their  
water gigs tends to do. What I mean by that is what the water forecasting group does  
is takes observations and does an excellent job of forecasting flood and takes the past  
as the key to water availability in the future. Whereas the weather forecasting groups  
use physics and sophisticated modelling to do weather forecasts. Once you move  
into the climate change arena, I think you have to base your arguments on physics,  
not on the behaviour in the past because I think the behaviour in the past is no longer  
10 the key to the present and the future. So what I think needs to happen is the groups  
within the Bureau that have carriage of seasonal prediction need to advance their  
science sufficiently to be able to use those approaches to predict future demand  
across the Basin.

15 THE COMMISSIONER: And “predict” is a good word for my purposes. Because  
if instead of using the word “forecast” one used the word “prediction” in the phrase  
in the statute, so it was a function of providing regular predictions on the future  
availability of Australia’s water resources, there’s no doubt that that would involve  
an attempt to project and describe climate change. Would that be right?

20 PROF PITMAN: Yes, and if you said near and far future.

THE COMMISSIONER: Yes?

25 PROF PITMAN: You would tie together the sciences necessary to allow you to  
strategise over the future of those.

30 THE COMMISSIONER: My point and I think it’s a lawyer’s point rather than a  
scientific point, we share common ground but we speak the same language that is  
English, is that this provision doesn’t talk about forecasts of the weather?

PROF PITMAN: No.

35 THE COMMISSIONER: It’s forecasting future availability of water resources.  
And it seems to me the word “future” means near and far?

PROF PITMAN: And I think most of the work the Bureau has done is the  
forecasting of water demand for next season, or the season after, not the forecasting  
of water demand for 2030 or 2050 or 2070.

40 THE COMMISSIONER: And demand, of course, is only one aspect of availability  
of water resources?

45 PROF PITMAN: Of course.

MR BEASLEY: I only have one more area to discuss but - - -

THE COMMISSIONER: In which case - - -

MR BEASLEY: We might give the witness a break.

5 THE COMMISSIONER: Professor, would you prefer to take a 10 minute break now or to press on?

PROF PITMAN: I'm very easy.

10 THE COMMISSIONER: Then I would like a 10 minute break if you don't mind.

MR BEASLEY: Thank you.

THE COMMISSIONER: Can we resume at 10 to, then?

15

MR BEASLEY: Yes. That's fine. As long as I can get my coffee in that time.

**ADJOURNED**

**[11.41 am]**

20

**RESUMED**

**[11.55 am]**

25 THE COMMISSIONER: Just before you start, Professor, one of the documents that you authored is the publication in Environmental Research Letters of 2016.

MR BEASLEY: Which tab is that, Commissioner?

30 THE COMMISSIONER: Tab 2. How do I pronounce the lead author's name? Ukkola, is it?

PROF PITMAN: Yes.

35 THE COMMISSIONER: Professor, Doctor, Mr Ukkola?

PROF PITMAN: Doctor.

40 THE COMMISSIONER: So Dr Ukkola and you and the others were in that letter drawing to attention a bias – a systematic bias that might be more generally operating as an inference from the illustration you drew to attention concerning a particular form of land surface models and the frequency and duration of drought?

45 PROF PITMAN: Yes.

THE COMMISSIONER: Methodologically, doesn't it virtually go without saying that all models should be, as it were, calibrated at an appropriate frequency in order to detect the possibility of systematic bias?

5 PROF PITMAN: So the word "calibration" there - - -

THE COMMISSIONER: So it's my word - - -

PROF PITMAN: Yes.

10

THE COMMISSIONER: I mean check that which had been modelled as a prediction against the later observed data for the modelled period?

15 PROF PITMAN: So climate models which were built first in the 1960s and have evolved since 1960 up to present day, the science community that built those models wants to answer a specific question, which is how much will the earth warm for a doubling of CO<sub>2</sub>.

THE COMMISSIONER: Yes?

20

PROF PITMAN: They're not really fussed about the trivia of drought. They're worried about how much the planet would warm for a doubling of CO<sub>2</sub>.

THE COMMISSIONER: I see?

25

30 PROF PITMAN: And they are fit for purpose for that. And the intergovernmental panel on climate change, in its recent reports, have spoken about climate models being fit for purpose at continental scales. What hadn't happened in my science is to start looking at how well the models capture the tails of the distribution, the extremes phenomenon, heatwaves, droughts and so forth. And what's happened in the last five years is the recognition is that we know how much the planet will warm from a doubling of CO<sub>2</sub>, it's no longer interesting, and our eye has been drawn to how well the climate models capture the evolution of important phenomenon like drought. And when we start to look at that in intensity, really sort of carefully, it turned out they worked really badly and what this paper is about is demonstrating that and some subsequent papers resolving that. So we now had to do it better.

35

THE COMMISSIONER: So you improved the model?

40 PROF PITMAN: Yes, but we didn't - - -

THE COMMISSIONER: That's what I meant by calibrating. Seen to what extent there had been a prediction aligns with what was observed for the then-predicted period?

45

PROF PITMAN: That's correct, but the word "calibration" means something specific in my community.

THE COMMISSIONER: You had better tell me what that is, if you can?

5 PROF PITMAN: So a model can be a black box that you run many, many times, evaluating it against observations, gradually tweaking things until you get the right answer, that's called calibration.

THE COMMISSIONER: Yes?

10 PROF PITMAN: The models we use express physics in a form of computer code and are run globally in little pixels and there aren't the observations to calibrate those models.

THE COMMISSIONER: I see, right?

15 PROF PITMAN: So we build them in basic physical principles and when we did that and then looked at how well they capture these phenomenon, it was not very well. And you would, for instance, when the sustainable yields project was done, there was a really common view that under double CO<sub>2</sub> droughts would become very much worse in general. We've now finessed such that droughts will become worse  
20 in some regions, but other regions the increase in rainfall will dominate that signal. And it's just much more complex and droughts will be much worse under double CO<sub>2</sub>.

25 THE COMMISSIONER: Thank you.

MR BEASLEY: Just picking up on the theme of modelling, the final thing I wanted to explore with you – and this was something I know you explored briefly with Mr O'Flaherty when you had a discussion with him. But the hydrological modelling for the Basin Plan is statistical.

30 PROF PITMAN: Yes.

MR BEASLEY: It's statistically based. You've been talking about physics for climate change. Can you fit those models together or does that present a difficulty  
35 such that you would have to do the hydrological modelling differently?

PROF PITMAN: So the work the Bureau does - - -

40 MR BEASLEY: Yes.

PROF PITMAN: - - - in its water division is what's called regression modelling which is, basically, statistical fitting – fitting curves to observation and judging and using those fitted curves. If you have a really big storm over the north of the Murray-Darling that's similar to really big storms that have hit the Murray-Darling in  
45 the past, then what you want to know is the flood flowing down the Basin. Those things work really, really well. And if you want forecasts of flood heights, the Bureau does it right. We've got no argument with that. If, however, you want to

know the long-term trends, 10, 20, 50 years into the future of water resources across the Basin, first of all, as I said at the very beginning, stationarity is dead, so you can't build it based upon a blind regression. Secondly, by definition with regression modelling, they don't work well for extreme events, because with regression  
5 modelling you fit a curve through observations.

THE COMMISSIONER: The best fit is always thrown out by an outlier.

10 PROF PITMAN: That's right. And outliers are by definition rare when it comes to an extreme event, or it wouldn't be extreme, therefore, there are very few points in your distribution.

THE COMMISSIONER: Your interpolation becomes hopelessly unreliable.

15 PROF PITMAN: Exactly. So if you want to know about extreme events like drought, you don't have much data to form your relationships around, so they become very unreliable. So around the world what most groups do, if they want to understand the future of resources, water resources across a basin like the Murray-Darling, is they build a physically based – that's shorthand for physics-based –  
20 representation of the system that takes into account everything from how groundwater interacts across that Basin through the soil into the vegetation, how the vegetation responds to increased CO<sub>2</sub>, how land management practices work, how much water you're taking out of the rivers for irrigation, how the water ..... irrigation flows into the atmosphere, all that stuff has one properly configured and evaluated  
25 physical modelling system. And if you're looking at 2030 or 2050, I think that's what you've got to do. If you're looking at the next five years, that's not what you've got to do. It depends how long your lens is into the future.

30 MR BEASLEY: That's all the questions I had for Professor Pitman.

THE COMMISSIONER: Professor, I think I have benefitted very greatly from your evidence. Maybe I won't be the best judge of that, but I feel that I have. I'm really very, very grateful for your effort and trouble to help me understand these things. May I trespass on you generously just one more question? If drought is a culturally  
35 and socially accepted occurrence, as it seems to be in the Basin, to what extent in managing and in order to manage, understanding the water resource in the Basin, does it matter that droughts may happen more often and more severely?

40 PROF PITMAN: So that's, of course, not a science question. There's a very strong human dimension to that question.

THE COMMISSIONER: That's why I used the word "trespass". Yes.

45 PROF PITMAN: From a climate scientist's perspective, what concerns us is how people, government is heading into the future not properly taking into account changes in the risk and the probabilities. So - - -

THE COMMISSIONER: Because something could be done about it, you mean?

PROF PITMAN: So, in my view – and this is moving a little bit outside my personal area of research expertise – the work that many farmers have been doing  
5 over the last generation has been hugely effective at managing their vulnerability to drought.

THE COMMISSIONER: What's an example of that?

10 PROF PITMAN: So I know of farmers who hedge against drought by owning several properties and they've picked those properties with deep knowledge of the Indian Ocean Dipole and the variability that leads to Australian rainfall. So they've picked farms, for instance, north of Lorne in Victoria and one in the New South  
15 Wales tablelands, etcetera, etcetera, because they've done the science to understand that if one's dry, the probability is the other one will be wet. In fact, there's a farmer right now who took all investment off one of his inland New South Wales properties a year ago, 18 months ago and moved all of that investment down to the property in Victoria, so that he didn't waste his money on the New South Wales property and got  
20 extra productivity out of the farm in Victoria.

So something that I don't think the public quite understand is if you really, really want to understand climate science, the best people probably to talk to are some of the people in the farming community who understand modes of variability really shockingly well. So farmers ever adaptable and they have learnt to manage their –  
25 many of them have learnt to manage their environment superbly well. But there are limits to adaptability. And I think it is going to prove inevitable that there are regions where the farmers, because of climate change, will not be able to survive, not because they will never be able to get a crop, but because instead of getting three years out of five productively, they will start to get two years out of five  
30 productively. And that changes the economic viability of the business.

MR BEASLEY: This is because of an increase in temperature, I take it?

PROF PITMAN: Yes. Yes. So temperature is a really good example where you  
35 could have a tiny change in the average because you get five days in a row of 45 Celsius. That – you know, if you imagine 365 days of temperature, five days get 10 degrees, warmer it makes an infinitesimal difference on the annual mean, but it's catastrophic if that heatwave occurs early in the growing season, for example. And I think finding how those changes in climate extremes are expressed onto the  
40 landscape to guide farmers as best we can is a valuable thing for the country to be doing to help manage the Basin. And it annoys me that whilst the science exists to do that very, very much better through the Bureau and CSIRO primarily, they're not being asked to do it.

45 And I think if that science was properly integrated and properly communicated on an ongoing systematic way, it would provide, particularly government, clarity that they have to find ways to support some on the land transitioning off the land, through no

fault of their own, and others need particular adaptation strategies. And government could begin to actually strategically manage the national agricultural resource. And I think we could do that. I'm not saying we could do it in 2019, but I think we have the capacity to do it properly. And what I see with the Murray-Darling is to a degree heading enthusiastically into the future thinking it will be all right and not taking that science into account. And I think that's regretful.

MR BEASLEY: "Be patient" is the phrase that's used.

10 PROF PITMAN: This notion that you hear, "Australia has always been a land of droughts and flooding rains and it will rain again and it will all be right", and we hear that routinely, lulls some people into a very dangerous false sense of security. Yes, it will rain again, yes this drought will break, but if droughts start lasting a little longer, start a little earlier – so instead of a three year drought, you get a five year drought, 15 that's catastrophic to people on the land. And we lull them into a false sense of security by the narrative we get from our senior decision makers. I think that's really regrettable.

20 THE COMMISSIONER: I'm very much obliged to you. Thank you so much.

PROF PITMAN: You're most welcome.

MR BEASLEY: You may have covered this now that you've said that, but I forgot to give you the opportunity of saying, if you don't feel that though I covered any 25 particular area in sufficient detail, or there's anything further you would like to add that you think would be useful to the Commission's knowledge, feel free to tell us now.

30 PROF PITMAN: I would love to have taken you through a two hour lecture on climate models, but I don't think you would enjoy it.

MR BEASLEY: You can give Mr O'Flaherty a call. He will happily listen to you for two hours and make a research note. Thank you very much for coming.

35 PROF PITMAN: Thank you.

THE COMMISSIONER: Thank you, again, Professor. I'm really obliged. Thanks.

40 <THE WITNESS WITHDREW [12.10 pm]

MR BEASLEY: So Mr Lamey is here, Commissioner.

45 THE COMMISSIONER: Thanks.

<EXAMINATION-IN-CHIEF BY MR BEASLEY

5

THE COMMISSIONER: Please sit down, Mr Lamey.

MR LAMEY: Thank you, Commissioner.

10

MR BEASLEY: Mr Lamey, first of all can you provide your full name and address to the Commissioner, please.

MR LAMEY: Christopher Roy Lamey, my address is 16 Waratah Street, Moree,  
15 New South Wales.

MR BEASLEY: And you've provided a signed statement to the Commission that's dated 19 September 2018.

20 MR LAMEY: I have.

MR BEASLEY: And that statement is true and correct?

MR LAMEY: True and correct.

25

MR BEASLEY: All right. I will tender that statement. And, first of all, happy anniversary.

MR LAMEY: Thank you. My wife is long suffering and I just couldn't have  
30 thought we've had the orchestra, we've had the parade, Royal Commission. What else could we need?

MR BEASLEY: Who knows, but that information was supplied to me by Mr  
35 Traeger, a research officer from the Commission whose ability to track these things down is quite extraordinary.

MR LAMEY: Incredible.

THE COMMISSIONER: That one on his own time, I hope.

40

MR BEASLEY: Well, he's so massively paid that – you've been in a farming partnership with your father since 1994.

MR LAMEY: Yes.

45

MR BEASLEY: Correct? Were you a farmer before that, though?

MR LAMEY: I was a farm worker and my father was a farm manager.

MR BEASLEY: All right. So how long have you been a farm worker?

5 MR LAMEY: Since 1993.

MR BEASLEY: All right. And that was employed by him, was it, first?

10 MR LAMEY: Yes, it was. Yes.

MR BEASLEY: All right. And your father previously, you say in your statement, had been farming in the Goondiwindi area since the 1980s. What sort of – was that a worker or did he own properties or - - -

15 MR LAMEY: No, as a worker. He was a farmhand on a farm only 10 ks to our east. And there was massive flooding in 1989. So that's where our original – yes, the original – we knew what we were in for from that.

20 MR BEASLEY: Yes. You say at Coomonga you mainly grow barley, wheat, chick peas and you've also grown cotton and sorghum in some years. Do you grow crops of barley, wheat and chick peas every year? Are they annual?

MR LAMEY: Yes, we try to as a rotation.

25 MR BEASLEY: Yes. And cotton depends on water availability, does it?

MR LAMEY: Yes, it does, yes, and the flooding cycle and – the Bureau of Meteorology, El Nino, just as the last professor spoke.

30 MR BEASLEY: How often do you get a cotton crop?

MR LAMEY: Probably one in five.

35 MR BEASLEY: Right. All right. And what about sorghum?

MR LAMEY: One in five, the same.

40 MR BEASLEY: All right. How many – it's a 2000 hectare farm. How many different paddocks are there for growing crops?

MR LAMEY: There's 11.

MR BEASLEY: Right. Okay. Now, you're not an irrigator.

45 MR LAMEY: Not on that farm. I do have other irrigation assets, but not that particular property.

MR BEASLEY: All right. And in paragraph 6 you talk about - - -

THE COMMISSIONER: The particular property is Coomonga. Is that right?

5 MR LAMEY: Yes.

THE COMMISSIONER: Is that how I pronounce it?

MR LAMEY: Yes.

10

MR BEASLEY: In paragraph 6, you state, when you talk about the beneficial flooding that you get from time to time on the farm. I will just call Coomonga the farm. How often does that happen?

15 MR LAMEY: Every 18 months since we've been there and also we had hydrology reports saying that that would be the case .....

MR BEASLEY: Right. And by beneficial flooding, not in volumetric terms but in terms of visible appearance how much water are we talking about, how deep is it  
20 over the property and where does it extend to generally.

MR LAMEY: Well, it's generally, depending on the severity of the floods we've had some that cover 10 per cent, 20, there's a sliding scale. A moderate flood would cover 50 per cent, a major flood 100 per cent, other than the levied areas.

25

MR BEASLEY: Right.

MR LAMEY: And it may range from a couple of centimetres deep to 30, 40 centimetres deep.

30

MR BEASLEY: And the levied areas, that's where the home is.

MR LAMEY: Yes.

35 MR BEASLEY: All right. Now, when did the Normans buy the property near your farm?

MR LAMEY: 2012.

40 MR BEASLEY: Right. Okay. And you say in paragraph 10 of your statement that the first new works you noticed after Norman Farming purchased their property was a bridge.

MR LAMEY: Yes.  
45

MR BEASLEY: Just before we get there, can you just give the Commissioner an idea whereabouts Normans, what – did they buy more than one property or was it just the one farm they bought?

5 MR LAMEY: In 2012 it was just that one farm that affects us, but there was – our farm was subdivided and the lot 3 of that subdivision had works on it as well and they were against the river, so that was prior to 2012. That was – yes, that was – yes, some of the – some of the beginnings of when we knew the river was going to be .....

10 MR BEASLEY: Just so we get it straight, the Norman Farming farm is on the border with your farm.

MR LAMEY: Yes, it is, directly.

15 MR BEASLEY: Shares a border.

MR LAMEY: Yes.

MR BEASLEY: In what direction.

20

MR LAMEY: To the west.

MR BEASLEY: What's the size of the Norman Farming property?

25 MR LAMEY: It's an aggregation of 18,000 hectares but that particular farm was 4,000 hectares and it has been subdivided so it would be around 900 hectares I would say the part that he still owns.

30 MR BEASLEY: All right. And can I ask you just to identify the bridge you're talking about in paragraph 10. Have you got a folder?

MR LAMEY: Yes.

35 MR BEASLEY: Called Chris Lamey? If you go to tab 3, is this a document you've prepared?

MR LAMEY: Yes, it is. A keynote.

40 MR BEASLEY: Yes. And if you go to page 6 - - -

MR LAMEY: Yes, that's - - -

45 MR BEASLEY: - - - that's a photograph of the bridge. When was this built, do you say?

MR LAMEY: It was built in - - -

MR BEASLEY: You've said October 2013, was that when you first saw it, or - - -

MR LAMEY: That's when, yes, we heard the rumours, we heard the rumours.

5 MR BEASLEY: What does that mean?

MR LAMEY: People were talking about building it, the guys who were actually building it were talking.

10 MR BEASLEY: All right. And just explain how this affects flooding on your property, this particular bridge.

MR LAMEY: Well, it's part of a chronic condition, and we - - -

15 THE COMMISSIONER: It's not actually the bridge, it's the abutments that have been artificially - - -

MR LAMEY: Yes.

20 THE COMMISSIONER: - - - intruded into the channel of the river.

MR LAMEY: That's correct, Commissioner; the bridge itself does not touch the water. It's the pushing in of the sides. The operators told us the bridge was too narrow to fit the river so they pushed in two metres on either side.

25 THE COMMISSIONER: Can I just understand: I don't want to, as it were, convert this hearing into some kind of pale imitation of a civil proceeding about nuisance, but do I understand that at least on the Queensland side – sorry, on both sides, the abutments that were pushed into the channel extend from private land?

30 MR LAMEY: Yes.

THE COMMISSIONER: And the actual vehicular track that leads to and from the bridge, that's completely on private land; is that right?

35 MR LAMEY: It is. I'm not sure of the technical terms but the bank of the river should be Crown land and - - -

40 THE COMMISSIONER: Don't worry about that. But the actual vehicular track that leads up to the bridge on either side.

MR LAMEY: Yes.

45 THE COMMISSIONER: That's on private land.

MR LAMEY: Yes.

THE COMMISSIONER: In general terms is the private land all controlled by the Norman interests?

MR LAMEY: No.

5

THE COMMISSIONER: Or someone else?

MR LAMEY: Yes. It has another owner on the New South Wales side.

10 THE COMMISSIONER: And don't go into too much detail, but in general terms, are you aware what their position is concerning the bridge?

MR LAMEY: No. They don't use it. I don't know whether they have arrangements for it to be there.

15

THE COMMISSIONER: So what appears to be a roadway, you invite me to infer was bridged in the manner you describe at the instance of the Norman interests; is that right?

20 MR LAMEY: Yes.

THE COMMISSIONER: But involving putting a bridge in a route which covers land that's not completely Norman land.

25 MR LAMEY: No. Exactly.

MR BEASLEY: This is the McIntyre River, just to be clear.

30 MR LAMEY: Yes, the McIntyre River. One side is Queensland, one is New South Wales.

MR BEASLEY: So the land toward the top right corner of that photo, is that New South Wales or Queensland?

35 MR LAMEY: That's New South Wales.

MR BEASLEY: Right. Okay. So you're standing – whoever took the photo was standing in Queensland.

40 MR LAMEY: Yes.

THE COMMISSIONER: Correct me, the boundary, the State boundary is on the

---

45 MR LAMEY: The middle.

THE COMMISSIONER: The midline.

MR LAMEY: Yes, it's different to the Murray.

THE COMMISSIONER: Now, so – and in your statement you've drawn to  
5 attention what I might call some unsatisfactory attempts to find out the two states'  
interest in this construction endeavour. Do I gather from what you've told me that  
neither state asserts that it was responsible for the bridge?

MR LAMEY: Yes. Yes. They don't – no one accepts any responsibilities for it.

10 THE COMMISSIONER: And again, don't go into too much detail, but I didn't  
quite understand your reference to a controlled structure. What does – that's a  
reference that was made in answer to your inquiries, I think, to Queensland; is that  
right?

15 MR LAMEY: Yes.

THE COMMISSIONER: And what did you understand the thrust of what they  
meant by telling you or assuring you that it was a controlled structure?

20 MR LAMEY: Well, a controlled structure by their definition cannot be touched.  
It's part of the river. There's no going back.

THE COMMISSIONER: So controlled within the meaning of the legislation  
25 protecting rivers from riparian landholders mucking them around.

MR LAMEY: Mmm.

THE COMMISSIONER: Is that - - -

30 MR LAMEY: That's how I take it.

THE COMMISSIONER: So it's the protective provisions in the Queensland  
legislation by which I think mostly it's an offence to carry out works of a certain  
kind in a river channel.

35

MR LAMEY: Yes.

THE COMMISSIONER: And it just seems a bit odd to me that if the state didn't  
40 build it and God didn't put it there, nonetheless it has become a protected feature of  
the river?

MR LAMEY: Yes. For what reason I don't know.

THE COMMISSIONER: Well, I say, this is not the time and place to go into civil  
45 litigation about that, but the thing that you draw to attention in particular is that it so  
happens that it's a physical constraint that slows the passage of floodwaters that

would ordinarily not stay on your land so long as to either damage crops or make the soil sour?

MR LAMEY: Yes, part of it.

5

THE COMMISSIONER: Contribute to that.

MR LAMEY: Part of this contributes to that.

10 THE COMMISSIONER: Thank you.

MR BEASLEY: Just so I understand in paragraph 10 you say:

15 *The first main works involves a bridge they put on the McIntyre River in October 2013.*

Have you got that date from a document or some other source of knowledge, or did you see it then.

20 MR LAMEY: My Dad travelled over it.

MR BEASLEY: I see, okay.

25 MR LAMEY: So he gave me a photo. I ..... have the exact dates that we found it, if you like.

THE COMMISSIONER: It's not a public road, is it, I gather?

30 MR LAMEY: No.

THE COMMISSIONER: What, neighbours are just happy for people to drive through the land.

35 MR LAMEY: They're not. They highly guard their land. Everything's locked. They don't enjoy trespassers but for some reason - - -

MR BEASLEY: Where's the Norman property in relation to that photo?

40 MR LAMEY: Directly to the north.

MR BEASLEY: Just tell me where the north is and – well, I guess New South Wales is looking south, so - - -

45 MR LAMEY: What photo are you looking at, sorry, Mr Beasley?

MR BEASLEY: Page 6, the ..... test.

MR LAMEY: Yes.

MR BEASLEY: So north would be to the - - -

5 MR LAMEY: To the left-hand side of - - -

MR BEASLEY: - - - bottom left-hand corner, right?

MR LAMEY: Yes.

10

MR BEASLEY: Right. So the Norman property – does the Norman property start immediately at the end of the bridge, there, when it crosses the river?

15 MR LAMEY: There is a little bit to the west, a couple of kilometres, and then it might stretch seven or eight kilometres to the east.

MR BEASLEY: Sorry. Just in relation to the left-hand side of this photo where the bridge ends in the photo, how far is the Norman property from the end of the bridge?

20 MR LAMEY: It's right on the end of the bridge.

MR BEASLEY: Right, okay. So we're talking a small number of metres.

MR LAMEY: Yes, it's - - -

25

MR BEASLEY: And a locked gate there.

MR LAMEY: Yes, yes. On the top of the bridge they have locked gates.

30 MR BEASLEY: Right. Is that how people get access to the Norman property?

MR LAMEY: It's basically for transporting produce.

MR BEASLEY: Right. I see.

35

MR LAMEY: They run road trains across there.

MR BEASLEY: All right. What produce?

40 MR LAMEY: Cotton.

MR BEASLEY: Right. Of course. Can I ask you this, though, so that I understand the chronology here? Your father's noticed the bridge in October 2013, but it says in paragraph 12 that you started to make inquiries about the bridge not until three years later in 2016. Was that gap because you started to make inquiries about the bridge after the flooding on your property?

45

MR LAMEY: After the flooding, yes. When we were physically affected we felt compelled.

5 MR BEASLEY: Right, I understand. In paragraph 13 you talk about works being done on the Norman property in addition to the bridge, and at the top of page 3 of your statement you say – you mention the time, late 2012, and then you say:

*Our family saw earthworks happening over a period of time.*

10 Do I take it that when you say “our family”, did you personally see these earthworks happening, or was it your father or somebody else?

MR LAMEY: It was going on all the time - - -

15 MR BEASLEY: All of you?

MR LAMEY: - - - so everyone had an opportunity to see it.

20 MR BEASLEY: That’s your father, your brother.

MR LAMEY: My brother and myself, yes.

25 MR BEASLEY: Right. Okay. And when you say “earthworks” what are you actually talking about specifically?

MR LAMEY: Scrapers that dig earth out of the ground and then place it somewhere else. Bulldozers. Laser buckets which do the same as a scraper.

30 MR BEASLEY: So you’re noticing a lot of construction vehicles.

MR LAMEY: Yes.

MR BEASLEY: And equipment on the Norman property.

35 MR LAMEY: Yes.

MR BEASLEY: And what were they doing?

40 MR LAMEY: They were building, well, building what a layman would think were roads.

MR BEASLEY: Right.

45 MR LAMEY: But they end up being the structures that held the water back. They were capped with gravel. There was also trucks carting gravel for some weeks.

THE COMMISSIONER: Well, the reason we have culverts in road embankments is to permit water to go through so yes, road embankments can hold back water.

MR LAMEY: Yes.

5

MR BEASLEY: How high off the ground are we talking?

MR LAMEY: We're talking 40, 50 centimetres, 60 centimetres, sometimes some of the culverts were a metre.

10

MR BEASLEY: Right. Okay.

MR LAMEY: So not big but our land's very flat, one in 3,000, one metre. If you build a bank one metre high it will hold water back three kilometres.

15

THE COMMISSIONER: Now, so far as this Commission is concerned, we have an evident interest under the terms of reference in so-called flood plain harvesting.

MR LAMEY: Yes.

20

THE COMMISSIONER: An expression which involves, to some degree or another, and in one or more different ways altering the surface of the land in order to divert, store, channel water that has naturally come onto the land usually from a river channel, sometimes from run-off.

25

MR LAMEY: Yes.

THE COMMISSIONER: You understand that?

30

MR LAMEY: Yes, I do, yes.

THE COMMISSIONER: And whether you call them levies or road embankments or channels or storages, dams, they are all some of the kinds of alterations to the surface of the earth that may produce diverted or stored water from floods.

35

MR LAMEY: Yes.

THE COMMISSIONER: And as I read your statement there has been apparently a lot of such work on your neighbour's land; correct?

40

MR LAMEY: Yes.

THE COMMISSIONER: And you have drawn to our attention that it has had, you say, devastating effect on the viability from time to time of your property?

45

MR LAMEY: Absolutely.

THE COMMISSIONER: And you've drawn to attention that you have raised this as a grievance with various official agencies, local council, state government, etcetera; is that right?

5 MR LAMEY: Yes, 74, in all, bureaucrats, I believe.

THE COMMISSIONER: Among the dealings you've had with officialdom, you've drawn to attention in your slide presentation, page 17, a position attributed to the Mayor of Goondiwindi Regional Council by I think a press release of 1 September  
10 2017. Have I read that correctly?

MR LAMEY: Yes, that's correct.

THE COMMISSIONER: Where attributed to the Mayor are these words:  
15

*It is important to remember that common law nuisance considerations between neighbours still apply here.*

Do you see that?

20

MR LAMEY: Yes.

THE COMMISSIONER: Now, has there been any litigation involving allegations of nuisance?  
25

MR LAMEY: Yes.

THE COMMISSIONER: Between you and your neighbours.

30 MR LAMEY: Yes, we've brought a claim. The claim - - -

THE COMMISSIONER: Has that litigation completed?

MR LAMEY: No. Hardly begun. The claim was pushed off onto an insurance  
35 company and it has been incredibly slow working through.

THE COMMISSIONER: Sorry. I'm just using technical words. By litigation I mean court proceedings. Have they commenced?

40 MR LAMEY: No.

THE COMMISSIONER: Believe me that means there's no litigation. Right. So there has been a claim made.

45 MR LAMEY: A claim made, yes.

THE COMMISSIONER: And that refers to damage suffered by your farming enterprise in which year?

MR LAMEY: 2016, August, September.

5

MR BEASLEY: Is this what you're talking about in paragraph – if you go to 28 of your statement, is that the claim you're talking about?

MR LAMEY: Yes, that is the claim.

10

MR BEASLEY: So the claim was – an assessment began in 14 October 2016.

MR LAMEY: Yes.

15

MR BEASLEY: It seems a long time to make an assessment.

THE COMMISSIONER: That's an insurance claim by you on your insurer?

20

MR LAMEY: No, by us on Norman's insurer. They wouldn't cover the insurance until the earthworks were deemed to be not worded as illegal. They had to be worded as unapproved and then the insurance company took it.

25

MR BEASLEY: The reason you are making a claim on Norman's insurance is based on a nuisance, is it?

MR LAMEY: A nuisance, yes, under common law.

MR BEASLEY: Right.

30

MR LAMEY: That's how it all – we received advice from Gavin Handran, our barrister-at-law.

35

THE COMMISSIONER: Please don't tell me the content of your advice unless you are happy for the world to know it. You will lose your privilege if you tell me the effect of your legal advice.

MR LAMEY: Understood.

40

THE COMMISSIONER: So you've got a privilege.

MR LAMEY: Yes.

45

THE COMMISSIONER: Which you may understand to be considered to be a valuable privilege. Don't give it up without thinking about giving it up.

MR LAMEY: Yes, thank you.

THE COMMISSIONER: I can't give you legal advice.

MR LAMEY: Thank you.

5 THE COMMISSIONER: If you tell me about the effect of your legal advice then other people will be able to look at the public record of this Commission and say, "He has waived privilege" and they may be able to get access to your legal advice. You don't have to tell me your legal advice. Please don't proceed to do so by accident if you don't want to.

10 MR LAMEY: Thank you, Commissioner.

THE COMMISSIONER: If you do want to tell me your legal advice, you're very welcome to do so, because I have no interest in your privilege. I just have an interest  
15 in making sure that you know what you're doing.

MR BEASLEY: I don't want to know a huge amount of detail about this, but you say the insurer keeps asking us for bits and pieces of information. Have they – has the insurance company admitted liability or not?

20 MR LAMEY: No.

MR BEASLEY: Right. Okay.

25 THE COMMISSIONER: More to the point, have their insured – that is, I will just call it your neighbours – have they admitted liability?

MR LAMEY: No.

30 THE COMMISSIONER: So that at the moment as I understand it in the framework of a claim by you that they have committed a nuisance, or they committed a nuisance which has caused you loss, you are presumed, through your lawyers, made a claim on your neighbours.

35 MR LAMEY: Yes.

THE COMMISSIONER: And you understand that your neighbours duly notified their insurers.

40 MR LAMEY: Yes.

THE COMMISSIONER: And admitted a whole lot of detail much of which you've drawn to my attention. That claim by them on their insurer has not yet produced, to your satisfaction, any money payable to you?

45 MR LAMEY: No.

THE COMMISSIONER: Right. Now, I think you've drawn to my attention that along the course of these, to you, unsatisfactory dealings with your neighbour's insurers, there was apparently a perception by someone that it would assist the insurance claim if the language of illegality were removed from your allegation.

5

MR LAMEY: Yes.

THE COMMISSIONER: Is that right? And by "illegality" I take it you mean the commission of an offence as opposed to the unlawful conduct which is the civil nuisance. I'm sorry to use technical language, but this is a technical area.

10

MR LAMEY: Yes. It – it was the wording that the Council had used in the noncompliance letters.

15 THE COMMISSIONER: Illegal.

MR LAMEY: Illegal.

THE COMMISSIONER: You understand that someone, presumably an insurer - - -

20

MR BEASLEY: An example of that, sorry, is at tab 6A.

THE COMMISSIONER: Yes.

25 MR BEASLEY: Is that what you're referring to, if you go to 6A of that bundle.

THE COMMISSIONER: Illegal structures on flood plain in the letter from .....

MR LAMEY: Yes.

30

MR BEASLEY: I take it Why Not Farm Co is a company owned by Norman Farms.

MR LAMEY: It is.

35

MR BEASLEY: Yes.

THE COMMISSIONER: I just want to understand it, because I don't think there's anything this Commission can really report about it. As you understand it, part of the time taken for your claim against your neighbour to be dealt with by your neighbour's insurer has involved dealings by which the word "illegal" was removed from the discourse and replaced by the word "unapproved".

40

MR LAMEY: Correct.

45

THE COMMISSIONER: As if that made a difference to the law.

MR LAMEY: Yes.

THE COMMISSIONER: Right. Now, I stress this Commission is not in a position to give you legal advice. I'm sure your lawyers are giving you legal advice, but for  
5 present purposes what matters is I think that you have raised a claim based upon an allegation that your neighbours committed a nuisance, and it seems to have been left by officials at various levels of government to you and your neighbour to sort this out as a matter of civil dispute.

10 MR LAMEY: Yes.

THE COMMISSIONER: Now, do you have a point you want to make to me about whether that is satisfactory or not.

15 MR LAMEY: It's not satisfactory.

THE COMMISSIONER: It being left as a matter of civil .....

MR LAMEY: No, it's absolutely not satisfactory. The point of this is the coercion  
20 that people have over local government and I believe that local government is not in a position to manage what's essentially all the brown areas on your map there. That's what local government are managing, and they're not operating under the Basin Plan.

25 THE COMMISSIONER: Well, one inquiry, and you've drawn these matters to my attention in your statement, one inquiry obviously is whether or not the structures by which activities that might be called floodplain harvesting are carried out are structures which are regulated as to their planning and construction by either State or local government provisions. That's a question you've raised for me.  
30

MR LAMEY: Yes.

THE COMMISSIONER: Now, I'm sorry if I've not understood all your material, which I've read, but do I gather that your inquiries rather suggest that until recently  
35 or perhaps even until today not all such structures are regulated as to planning or construction?

MR LAMEY: No.

40 THE COMMISSIONER: I've captured that correctly?

MR LAMEY: It should be, but it is not.

THE COMMISSIONER: It seems, on your inquiries, that they are not regulated?  
45

MR LAMEY: Yes.

THE COMMISSIONER: Now, let me suppose that they were regulated in a way that is quite familiar for the regulated development of land whereby certain kinds of work have to obtain approval before they may lawfully be carried out.

5 MR LAMEY: Yes.

THE COMMISSIONER: Even on your own land.

MR LAMEY: Yes.

10

THE COMMISSIONER: Especially on your own land.

MR LAMEY: Yes.

15

THE COMMISSIONER: And let me also assume that in a quite familiar way, applications for what might be called development approval or development consent required in order to be lawfully dealt with and determined, notification to neighbours and an opportunity for neighbours to lodge what might be called objections. I just want you to assume all of that.

20

MR LAMEY: Yes.

THE COMMISSIONER: Is that the kind of system that you want me to consider as an appropriate one for floodplain harvesting works?

25

MR LAMEY: Absolutely.

THE COMMISSIONER: But you draw to my attention, I think, that you think that has not applied in your vicinity?

30

MR LAMEY: No.

THE COMMISSIONER: Have you taken that up with members of Parliament?

35

MR LAMEY: Yes.

THE COMMISSIONER: And have you had any responses as to whether as a matter of government policy, there should or should not be more regulation than apparently there presently is?

40

MR LAMEY: No, no one's willing to go that extra step.

THE COMMISSIONER: What's the clearest statement you've got from somebody in government concerning whether there ought to be such regulation?

45

MR LAMEY: I wrote to – recently I wrote to Jackie Trad, the Planning Minister and Deputy Premier of Queensland informing her about these problems I thought

were in the Sustainable Planning Act and she generically pushed me off onto Anthony Lynham, who's the Minister for Department of Natural Resources and Mines, stating that she – it was not her department.

5 THE COMMISSIONER: And have you got from Minister Lynham a response yet?

MR LAMEY: No.

10 THE COMMISSIONER: Well, I want to make it clear, I'm not sure from the material yet as to whether there is any regulation of these structures. Whether there is or not, do I gather that your message to me is that floodplain harvesting ought to be carried out with appropriate accommodation of the interests of neighbours, be they upstream or downstream; is that right?

15 MR LAMEY: Yes.

THE COMMISSIONER: Upstream, the interests will commonly be that some such structures will impede the timely drainage of temporary floods.

20 MR LAMEY: Yes.

THE COMMISSIONER: With the results you've drawn to attention the destruction of standing crops or growing crops and/or the spoiling of the soil for immediate replanting?

25

MR LAMEY: Yes.

THE COMMISSIONER: Ultimately an irrigation question, isn't it?

30 MR LAMEY: Yes, it is, and we call it the ground goes sour.

THE COMMISSIONER: Yes. Downstream, the possible effect on a neighbour is that what would otherwise be natural flow, perhaps to the benefit of their land, will not happen.

35

MR LAMEY: Mmm.

THE COMMISSIONER: Or will happen in reduced quantity.

40 MR LAMEY: That's correct.

THE COMMISSIONER: I've captured the idea?

MR LAMEY: Yes, that's it.

45

THE COMMISSIONER: Now, so far as the Basin Plan in the northern Basin is concerned, is there something, apart from what you've set out in your statement that

you want to draw to my attention as in need of improvement concerning these matters?

5 MR LAMEY: Yes, I think special attention needs to be taken to these floodplain areas of the Basin. They should be protected similar to the river. I mean, our farm is on part of the river, what would be called the braided system, so the water must break out and flow over – over our land and we’re the custodians of that. If we want to intercept that water and we thought it was legally – it was lawful to do, it could be beneficial for us to stop these floods, but we – we think – you know, there should be 10 the legislation to protect that water because it’s only – it’s the river’s water, it’s out on the floodplain for a short period of time and then it will drop back into the river, where it will continue flowing down to benefit the rest of the Basin. So it’s broader than my family, our immediate neighbours. We see it as Queensland are not regulating that sensitive – those sensitive areas to put water into the Murray-Darling 15 Basin at the top of the catchment. All that brown area there on the map, every drop of rain that becomes run-off should end up in the – in the river and if it’s not – if it’s intercepted before, then you’ve got to draw a smaller catchment. The Murray-Darling Basin does not have that catchment because of these – where the water is being intercepted. So - - -

20

THE COMMISSIONER: Now, you then have drawn to my attention the third flood event of late March which did result in actual litigation in April. Is that right?

25 MR LAMEY: No. Well, under the – under what you’ve – how you’ve just educated me.

THE COMMISSIONER: You actually went to the Supreme Court.

30 MR LAMEY: That was an interlocutory injunction.

THE COMMISSIONER: Believe me, that’s litigation.

MR LAMEY: Yes.

35 MR BEASLEY: Yes. So paragraph 39 of your statement is where the Commissioner is.

THE COMMISSIONER: I’ve read your paragraph 39 as meaning that litigation concluded in a compromise.

40

MR LAMEY: Yes.

45 THE COMMISSIONER: But I’ve read your paragraph 42 as suggesting that there is, in the last few months, a planning approval application for levy banks on your neighbour’s land.

MR LAMEY: Correct.

THE COMMISSIONER: Suggesting, as I say, by very clear inference there is regulation of some kind of some of these floodplain harvesting structures.

MR LAMEY: Yes.

5

THE COMMISSIONER: I don't want you to dwell on this in too much detail, but I was intrigued by the notion that, to use your language, you would have a ground of appeal against a development application for those earthworks, only if the earthworks caused the level of flood water on your property to reach 50 millimetres above the floorboards of your parents' stilted house.

10

MR LAMEY: That's correct.

THE COMMISSIONER: Please tell me she was not a lawyer.

15

MR LAMEY: No. No. A planning manager in Goondiwindi Council.

THE COMMISSIONER: Thank you. So that is, as you will have gathered from my last facetious comment, for which I apologise – you will gather that - - -

20

MR BEASLEY: You've got to get a few on the record.

THE COMMISSIONER: - - - that that is a matter for lawyers to advise you, you understand.

25

MR LAMEY: Yes, I did seek counsel after that.

THE COMMISSIONER: Please don't take any advice from me in that regard.

30

MR LAMEY: Yes. No. We did seek advice.

THE COMMISSIONER: Thank you. And you don't have to tell me what it is. Thanks.

35

MR LAMEY: And that was based under affecting two people. The levies were categorised as only affecting two people, so that's why they were happy to leave the structures. That's – that's where I talk about the sensitive water not being – that there was no provision for the flow of water. It was only ever about how many people it affected.

40

THE COMMISSIONER: All right. What do you understand by only affects two people?

45

MR LAMEY: You – the level of permission – of permit was characterised by how many people it affected. So this was noted - - -

THE COMMISSIONER: It affects as many people as own land hydrologically influenced by the structure. Isn't that right?

5 MR LAMEY: Yes. That's right, but it makes no sense to me. I still can't grapple with the idea of - - -

THE COMMISSIONER: Of?

10 MR LAMEY: Of why these waters can be stopped and we can be damaged so badly.

15 THE COMMISSIONER: What I want to make clear to you is please don't assume that that is so. As the Mayor said, with respect to him, correctly, unless Parliament enacts otherwise – and I don't know whether the Queensland Parliament has, but unless Parliament enacts otherwise, the common law of nuisance governs these matters.

MR LAMEY: Yes.

20 THE COMMISSIONER: And the Basin Plan and the Water Act themselves don't abrogate in its entirety, query to any real extent, the law of nuisance.

MR LAMEY: So the - - -

25 THE COMMISSIONER: That is - - -

MR LAMEY: - - - Basin Authority wouldn't sue for nuisance because the water was held up out of the Basin.

30 THE COMMISSIONER: They might. That's what I'm saying is if – the law of nuisance probably still continues to have operation.

MR LAMEY: Yes.

35 THE COMMISSIONER: Now, the Authority, however, may not be what we call a proper plaintiff in a nuisance action or a suit to restrain a nuisance.

40 MR LAMEY: Okay. Well, we felt we were a minnow fighting a giant where money buys a result. And we thought we were fighting for the rest of the Basin to have the water, because we only want the river to flow as per normal. And I felt it all rested on me. There was no legislation in Queensland, whether it be local or state, that provided for the water to – to flow in a natural manner, even though they had agreed to the Murray-Darling Basin Plan.

45 THE COMMISSIONER: So your point is you believe that there are aspects of your position that render any litigation to vindicate your rights as being in truth public interest litigation?

MR LAMEY: Exactly.

THE COMMISSIONER: And I can assure you in Queensland there are various groups that take on public interest litigation from time to time, but - - -

5

MR BEASLEY: I'm sure Adani knows that.

THE COMMISSIONER: Exactly. But, obviously, again, that's something I can't possibly give you any advice on. But I understand why you say and I'm sure many other people would sympathise with the proposition, that there is public interest involved even when a private landowner sues for his, her or its own damage.

10

MR LAMEY: Yes.

15 THE COMMISSIONER: So - - -

MR LAMEY: Yes. Probably the evidence - - -

THE COMMISSIONER: There's a coincidence between a private interest and a public interest particularly when - - -

20

MR LAMEY: Yes.

THE COMMISSIONER: - - - the behaviour of a river is concerned.

25

MR LAMEY: Yes.

THE COMMISSIONER: I do understand. Yes.

MR LAMEY: Yes. Me bringing this to your attention is more about that public interest and the disconnect. It's no different to the professor just talking about the little jigsaw puzzles. What's the use of having a beautiful big jigsaw of 3,000 pieces if you've got these little pieces?

30

THE COMMISSIONER: If you live on one of them, and it has been ruined, yes, I understand. Well, compliance and enforcement, as you know, is part 1 of my terms of reference. And I thought, reading your presentation, that I might raise this with you. Would your criticisms of the system, as opposed to your grievance against your neighbour - - -

40

MR LAMEY: Yes.

THE COMMISSIONER: Would your criticisms of the system be met to any degree if by law, either a Commonwealth agency such as the MDBA or state agency were expressly authorised to sue people with respect to either - with respect to unlawful floodplain harvesting works that cause detriment to the river or detriment to neighbours? Would that - - -

45

MR LAMEY: That would be an excellent motivation for people - - -

THE COMMISSIONER: Now, that may already be the case, you see. I will consider that. I understand. So one of the things that you want to draw to my  
5 attention is it seems a bit inadequate – or it seems perhaps very inadequate for you to have to shoulder expense at your own risk.

MR LAMEY: Yes.

10 THE COMMISSIONER: Including the costs of the other side to enforce by civil litigation matters which, although they affect your private interest, also directly affect public interest in the river.

MR LAMEY: Yes.

15 THE COMMISSIONER: That's your point?

MR LAMEY: That is my point. That is my point. Whether it be property rights, whether it be just the enjoyment of the community. You know, it just goes on and on  
20 and on how many people are affected by waters when they're intercepted.

THE COMMISSIONER: Does Queensland have open standing for its planning legislation?

25 MR BEASLEY: I don't know. Mr O'Flaherty will have to find that out.

THE COMMISSIONER: I was just assuming he knew.

MR BEASLEY: So did I.

30 THE COMMISSIONER: Keep me in suspense.

MR LAMEY: Excuse me. What's open - - -

35 THE COMMISSIONER: Open standing is a lawyer's nickname for provisions, such as we have in New South Wales, whereby anybody at all without needing to have personal connection with a situation may sue to vindicate the planning law of the state.

40 MR LAMEY: I like that idea.

MR BEASLEY: In other words you don't have to be alleging you're suffering a damage or - - -

45 MR LAMEY: Yes, I love that idea. I just - - -

THE COMMISSIONER: Not everyone does, it needs to be said, but - - -

MR BEASLEY: I reckon there's a few coal companies that aren't that keen on it.

5 THE COMMISSIONER: Anyhow, so that's what open standing means, that the courts must entertain a case even if it is by somebody that other people might regard as busy bodies.

MR LAMEY: Okay.

10 MR BEASLEY: Provided they don't become a vexatious litigant.

THE COMMISSIONER: Yes.

15 MR BEASLEY: I just wanted to get on the record the chronology of what has happened here.

MR LAMEY: Yes.

20 MR BEASLEY: So forget about the statement for a moment. I want to connect it up to the documents in this brief. So we've already gone to the letter at tab 6A.

MR LAMEY: Yes.

MR BEASLEY: But if you have a quick – I think you might have that - - -

25 MR LAMEY: I do.

MR BEASLEY: So John, I take it, that must be a reference to John Norman?

30 MR LAMEY: Yes.

MR BEASLEY: Who is the CEO of Norman Farming. Correct?

MR LAMEY: Yes.

35 MR BEASLEY: And so, as we've discussed, this is the Council clearly asserting that the build-up access roads, piles of soil, head ditches and tail drains placed across the floodways are illegal structures and they – the council informed you of that. So if you go back to tab 5, that's a letter from the Council to you.

40 MR LAMEY: Yes.

MR BEASLEY: For some reason, this Council believes in really small font for dates, but at the top - - -

45 THE COMMISSIONER: 14 October.

MR BEASLEY: It's 14 October, if I look really closely. Again, informing you that it considers that the structures on the Norman property – Norman Farms property are illegal structures. Correct?

5 MR LAMEY: Yes.

MR BEASLEY: And then there's another letter behind tab 6B. So that's a letter telling them – appreciating response from you. I don't think we've got a copy of the response.

10

MR LAMEY: Response from Norman?

MR BEASLEY: Yes. And then, for whatever reason, if you go to tab 6D, by 13 April 2017 – this is a letter from the Goondiwindi Council to Norman Farming, again. They've changed tack in relation to labelling the works as illegal works and have now said that they should be referred to as unapproved structures.

15

MR LAMEY: Yes.

20 MR BEASLEY: I would - - -

MR LAMEY: In the timeline there - - -

MR BEASLEY: - - - always assume that an unapproved structure might be illegal, but - - -

25

THE COMMISSIONER: Yeah. I mean, it's semantics that I don't think this Commission should get into.

MR BEASLEY: No. And ultimately, though, if you go to tab 9 – were these – at tab 9, which is a letter from the Council to Norman Farming of 21 December 2017, can I just ask. This correspondence, was it – how did you get it? Was it the Council gave it to you or - - -

30

MR LAMEY: How did I get this? Yes, I asked - - -

35

MR LAMEY: Yes.

MR LAMEY: I wrote to the Council and asked.

40

MR BEASLEY: And this is an indication that the Council has now approved the works, retrospectively.

MR LAMEY: Yes.

45

MR BEASLEY: Norman having lodged - - -

MR LAMEY: Only 700 metres of the 52 kilometres, though.

MR BEASLEY: I see. Okay.

5 MR LAMEY: It's only this very small part.

MR BEASLEY: Yes. Yes.

10 MR LAMEY: And they've given him four years to correct it.

MR BEASLEY: Yes. All right. Then, going back to your statement, at paragraph 42 you've said in the last week you've received this USB stick from the Council.

15 MR LAMEY: Yes. When I found this amended - - -

MR BEASLEY: And that's the approval for the 700 metres of the 52 kilometres, is it?

20 MR LAMEY: It is – no.

MR BEASLEY: No.

25 MR LAMEY: It was the original application for the 52 kilometres of bank. I asked for the original. I wanted to piece together all the paperwork. And this is something that I had never seen.

MR BEASLEY: But that – was that application made after it had been built, though?

30 MR LAMEY: Yes.

35 MR BEASLEY: Yes. I also wanted to ask you about – if you go to tab 15 of your – the folder, there's a transcript of a report that was on the 7.30 Report on the ABC which included an interview with you, but it also involved a visit to your property by Mr Glyde, the CEO of the Basin Authority.

MR LAMEY: Yes.

40 MR BEASLEY: Who is only given very limited dialogue in the transcript of this report. Did he have a discussion with you when he visited his farm beyond what's recorded in this transcript?

MR LAMEY: Yes, he did. Yes.

45 MR BEASLEY: Did he offer any solutions as to - - -

MR LAMEY: No solutions.

MR BEASLEY: Right. Did he suggest what might be able to ..... what was the purpose of him coming, then? Did you invite him, or?

5 MR LAMEY: Yes, we invited him to come and see the problems on the river firsthand.

MR BEASLEY: Did he offer – did he suggest that they just don't have the power to do anything, the Basin Authority, or - - -

10 MR LAMEY: Yes. They said that until the Water Sharing Plan comes out in Queensland, which Queensland do not have any, they don't have any power for the levy banks, but it's my understanding that he had power in the river, water is being held up in the river. He did have jurisdiction over compliance. It was - - -

15 MR BEASLEY: Did you discuss floodplain harvesting with him at all?

MR LAMEY: Yes.

20 MR BEASLEY: All right. What was that? Doing the best of your memory what did you discuss with them about that?

MR LAMEY: It was about taking into account the time of pumping. A pump can only pump a physical amount. So - - -

25 MR BEASLEY: I'm not sure I connect that with floodplain harvesting. Just explain that.

30 MR LAMEY: If you're filling a storage, it might take you three weeks to fill it. So you need a supply for three weeks.

THE COMMISSIONER: You need to hold back enough water for long enough in order to fill your storage - - -

35 MR LAMEY: Yes.

MR BEASLEY: Now I'm with you. Yes.

THE COMMISSIONER: - - - with a pump that has a limited capacity.

40 MR LAMEY: Yes.

THE COMMISSIONER: And all pumps have a limited capacity.

45 MR LAMEY: That's right.

MR BEASLEY: In the hypothetical example you're giving you need structures on your property to hold the water back.

MR LAMEY: Yes.

MR BEASLEY: On the floodplain.

5 MR LAMEY: Yes.

MR BEASLEY: That has come from an overflow in sufficient time to enable the pumps you've got to put it into whatever storage you've got depending on the site.

10 MR LAMEY: Yes. You're not allowed to build any more pumps. You can't increase your pump size. You can't increase your pump size. You can't increase your gate size, your channel size, all from September 2000. This is a loophole where they're allowed to take more water off the flood plain.

15 MR BEASLEY: Right. And what was the nature of the discussion you had with Mr Glyde about this issue though?

MR LAMEY: The leakage that they don't account for.

20 MR BEASLEY: Leakage meaning - - -

THE COMMISSIONER: What do you mean by the leakage?

25 MR LAMEY: Whenever I talk to Department of Natural Resources and Mines, the difference between the hydrological grabs along the river system – the difference is leakage. So it may be 10,000 megalitres a day come through Boggabilla, and 2,000 megalitres comes past the gate at my – at our farm at ..... gauge. So the leakage is 8,000 megalitres a day. That's – they write that off. It is - - -

30 THE COMMISSIONER: You don't mean leakage literally. You mean - - -

MR LAMEY: It's leakage from the system.

35 THE COMMISSIONER: But you don't mean physically molecules of water going somewhere out of the channel.

MR LAMEY: Yes.

THE COMMISSIONER: You do.

40

MR LAMEY: Yes.

THE COMMISSIONER: Are you talking about it being pumped?

45 MR LAMEY: No. I'm talking about it getting out of the floodplain of this braided system and travelling across.

THE COMMISSIONER: You mean naturally.

MR LAMEY: Naturally, but some – it's the percentage of leakage.

5 THE COMMISSIONER: It's just the word "leakage" that's throwing me, but I understand what you mean. Yes.

MR LAMEY: It's an odd term.

10 THE COMMISSIONER: Attributed to Mr Glyde in what no doubt is the transcript of an edited statement by him. I don't mean to suggest any – anything sinister.

MR BEASLEY: It may or may not be.

15 THE COMMISSIONER: I've never seen something go without any editing. I just want to concentrate on this. Mr Glyde seems to me to have said some quite sympathetic things about your position:

20 *For people like the Lameys, it's very hard to negotiate their way through and find what's the best way to make sure the problems they're experiencing don't occur.*

But then he says – I don't really want to ask you about that, but then he goes on and says:

25 *It is attributed to him that he had acknowledged that there was nothing the Authority, that is, the MDBA, could do in relation to the approval and regulation of irrigation earthworks.*

30 And he has then quoted these overlapping responsibilities, local, state, different departments. Then you've got the Commonwealth. Then you've got the Murray-Darling Basin Plan. Now, I want to make it clear, none of those statements seems to me to be in any way wrong. That is, they're not inaccurate. That's true.

35 MR LAMEY: That's true.

THE COMMISSIONER: Yes. Except, and I hope I'm being fair to Mr Glyde. He says there's overlapping responsibilities. The point about overlapping responsibilities I suppose is that not all the same agent, not all the agencies have the same authority.

40

MR LAMEY: Yes.

THE COMMISSIONER: Now, I'm bound to say that it's my view that the MDBA has no authority whatever over the ..... interests in relation to their building of unapproved structures.

45

MR LAMEY: No.

THE COMMISSIONER: But the State of Queensland does.

5 MR LAMEY: Yes.

THE COMMISSIONER: Undoubtedly.

10 MR LAMEY: When we kept running into roadblocks – sorry.

THE COMMISSIONER: And I should say also the judicature of Queensland, including its Supreme Court administration the common law which includes nuisance.

15 MR LAMEY: Yes.

THE COMMISSIONER: So I asked you earlier about what might meet your criticisms. Are you raising the possibility of the MDBA having a power to regulate these structures?

20 MR LAMEY: No. I thought they had it in the river bank itself. So the bridge would have been something that – when I complied online - - -

25 THE COMMISSIONER: I think that's the State of Queensland and the State of New South Wales.

30 MR LAMEY: Yes, one on one side. When I was having interstate troubles, I thought – in my mind, I thought the Murray-Darling Basin Authority was the overarching body to delegate responsibility.

THE COMMISSIONER: Just assume, pretty safely, that the MDBA has not taken over legal dominion of all the rivers in the Basin.

35 MR LAMEY: Yes.

THE COMMISSIONER: Just assume that.

MR LAMEY: Yes.

40 THE COMMISSIONER: Personally, I would have thought the law is complicated enough without adding yet another body with authority over something that the State of Queensland, the State of New South Wales already has authority over.

45 MR LAMEY: Yes. No, that's very true.

MR BEASLEY: Just on that - - -

THE COMMISSIONER: I think that takes that matter as far as it goes.

MR BEASLEY: Yes, it does. It's just interesting that the – Mr Glyde's answer at the top of page 3 - - -

5

THE COMMISSIONER: Yes.

MR BEASLEY: - - - about the need to, apart from lift – monitoring, but lift measurement.

10

THE COMMISSIONER: Top of page 3?

MR BEASLEY: Top of page 3.

15 THE COMMISSIONER: I'm looking at a different one, I suspect. Which one are you looking at?

MR BEASLEY: Tab 15.

20 THE COMMISSIONER: 15.

MR BEASLEY: 15, top of page 3.

THE COMMISSIONER: Yes.

25

MR BEASLEY:

*There is clearly a need across the Basin to lift compliance, to lift our level of knowledge, to lift measurement, monitoring and metering of water take, water use and even just water flowing down the system.*

30

How that - - -

THE COMMISSIONER: I think on any view, with respect to Mr Glyde, that is very quotable and clearly correct.

35

MR BEASLEY: Yes, it is, but how does that fit in with the confident estimate of a base line diversion limit.

MR LAMEY: Yes, it's a moving target.

40

MR BEASLEY: Difficult for me to know. Now, I don't want any editorial comment from you on this, please, Mr Lamey, but just as a matter of fact, Mr John Norman and the CFO of Norman Farming have been charged by the Queensland Police with some alleged offences in relation to funds from the 'Healthy Head Waters Use Efficiency Project'.

45

MR LAMEY: Yes, that's correct.

MR BEASLEY: I understand that, and I imagine they've pleaded not guilty.

THE COMMISSIONER: And you understand, don't you, that that being so, this  
5 Commission will, out of respect for that process and to observe the laws of contempt  
of court, say nothing about those matters.

MR LAMEY: Yes, absolutely, and it has nothing to do with the effect of water on  
my farm.

10 MR BEASLEY: All right. They were the questions I had for Mr Lamey. Is there  
anything – obviously, you – the fact that you provide us with a statement and a whole  
range of documents is – has shortened the amount of time you have to spend in the  
witness box because we have your evidence in written form, but is there anything  
15 you feel we haven't covered in sufficient detail or anything you want to add to the  
matters raised in your statement or that might be relevant to the Commission?

MR LAMEY: More on compliance.

THE COMMISSIONER: Yes.  
20

MR BEASLEY: Go ahead.

MR LAMEY: We, the Lamey family, witnessed the taking of water from the river  
that we thought was inappropriate. So we asked for an investigation to take place. Is  
25 it legal, because no one really knows, the neighbour does - - -

THE COMMISSIONER: You asked the Queensland authority.

MR LAMEY: Yes, we asked the Queensland Department of Natural Resource to  
30 investigate. We had photos, dates, film, a lot of evidence about this take. So I've  
only just found out last week that - - -

MR BEASLEY: When you say this take, are you talking about pumping or are you  
35 talking about floodplain harvesting?

MR LAMEY: Just, well, it was not on the floodplain, the water was down in the  
banks of the river.

THE COMMISSIONER: It was being taken by pump, was it, or not?  
40

MR LAMEY: Gravity.

THE COMMISSIONER: Gravity.

45 MR LAMEY: Gravity, that's the golden - - -

THE COMMISSIONER: So a constructed offtake.

MR LAMEY: Yes, a pipe, a tap. So that's when you're irrigating, that's the golden – that's the goose that lays the golden egg. You don't have to spend diesel, no pumps breaking down; it's open the tap, let the water flow in. The water was down in the river below the banks and the water was running into a channel straight into  
5 Norman Farming infrastructure and then it was being taken – could be taken anywhere on the whole aggregation that is joined.

THE COMMISSIONER: What happened last week?

10 MR LAMEY: Investigator apologised for not getting back to me, but we've closed that. Closed that. The pipe's been removed. We've dealt with the solicitors.

MR BEASLEY: Investigated from where?

15 MR LAMEY: From Department of Natural Resources.

MR BEASLEY: Right. Queensland.

MR LAMEY: Queensland, yes. This man didn't know anything about water. We  
20 had to step him right through. He wanted us to take - - -

THE COMMISSIONER: Just concentrating on what happened last week. You were told that what the - - -

25 MR LAMEY: He couldn't prosecute.

THE COMMISSIONER: Final case has been closed.

MR LAMEY: It has been closed.  
30

THE COMMISSIONER: But the pipe has been removed.

MR LAMEY: Pipe has been removed, yes, he agreed because they couldn't take it any further because Queensland don't know - - -  
35

MR BEASLEY: Because it's Queensland.

MR LAMEY: Don't know where the river is.

40 THE COMMISSIONER: No.

MR LAMEY: The river is not surveyed. They couldn't prove legally that he was taking water from the river because Queensland don't know where the river is.

45 THE COMMISSIONER: Thank you.

MR LAMEY: So - - -

THE COMMISSIONER: Well, to be fair, rivers move, I suppose, but I understand your point, and so you would want to draw to my attention that compliance includes giving the offices of the State enough information of an appropriate kind to enable where prosecution is appropriate, prosecutions to succeed.

5

MR LAMEY: Yes.

THE COMMISSIONER: I understand.

10 MR LAMEY: And again we were just doing it for the community. Someone else's water, someone's property rights downstream. And it was a lot of work for us, and a lot of duress, a lot of appointments and meetings. We had to put our time – time out and then, you know, for the government not to know where the river is, which is the border between Queensland and New South Wales is - - -

15

THE COMMISSIONER: It's not an unknown phenomenon for investigators, be they private people or police or other regulators, to be disappointed when those in charge of decisions to prosecute or not, are not satisfied as to the adequacy of the material to justify a prosecution. That is not intended to make you feel better about the position but simply to say this is a probably perennial aspect of all law enforcement that not every case of putative wrongdoing will find itself in a criminal court. There are reasons why these resources that are necessary to prosecute, including ultimately courts, if you like, rationed. Again, that's not meant to make you feel better about it but it is to describe a state of affairs which is universal - - -

20

MR LAMEY: Yes.

THE COMMISSIONER: - - - not just in this country.

30 MR LAMEY: I'm learning a lot today, Commissioner.

THE COMMISSIONER: Not every wrongdoing, you will be pleased to know, ends up in a criminal court.

35 MR LAMEY: Yes.

THE COMMISSIONER: We could not have a court system that extensive.

MR LAMEY: Yes.

40

MR BEASLEY: Commissioner - - -

THE COMMISSIONER: So there's nothing sinister about regulators deciding not to pursue criminal prosecution, particularly where the alleged wrongdoing seems to have been stopped.

45

MR LAMEY: I'm totally – totally satisfied. Thank you.

THE COMMISSIONER: Well then - - -

MR BEASLEY: I think there's something more Mr Lamey - - -

5 THE COMMISSIONER: Sorry. Yes, please.

MR LAMEY: Yeah, I've got some more - - -

10 THE COMMISSIONER: No, don't apologise.

MR LAMEY: - - - compliance issues.

THE COMMISSIONER: Yes.

15 MR LAMEY: Unless you search these conditions, you cannot find it, so the information is in tab - - -

20 THE COMMISSIONER: This is the conditions for development consent, you mean?

MR LAMEY: No, for water licences.

THE COMMISSIONER: Yes. All right. Yes.

25 MR BEASLEY: So you're taking us to tab - - -

MR LAMEY: I haven't found it yet, sorry, Mr Beasley. Tab 11.

30 THE COMMISSIONER: Yes.

MR LAMEY: I'm on page 31.

THE COMMISSIONER: Yes.

35 MR BEASLEY: Okay. You've got a different - - -

THE COMMISSIONER: Which document?

40 MR BEASLEY: - - - folder to me then.

THE COMMISSIONER: Which document is that?

MR LAMEY: It's in the IM, Norman Farming.

45 MR BEASLEY: Tab 10, is it?

THE COMMISSIONER: The information memorandum, yes?

MR LAMEY: Yes. So I'm looking at taking water. It's licence number 102539.

THE COMMISSIONER: Yes.

5 MR LAMEY: Taking of flow from Booberanna Creek.

MR BEASLEY: Let's identify the document first. So you're looking at what looks like an information memorandum for the sale of the Norman.

10 THE COMMISSIONER: It's tab 10.

MR LAMEY: Yes.

15 MR BEASLEY: Tab 10 for the Norman Farming property, it's dated October 2017 prepared by CBRE, okay. And you're on page - - -

THE COMMISSIONER: Which licence were you drawing to attention?

MR LAMEY: 102539.

20

THE COMMISSIONER: Yes, the third of those listed.

MR LAMEY: Yes, taking a flow from Booberanna Creek.

25 THE COMMISSIONER: Yes.

MR LAMEY: Maximum rate of take 150 megalitres per day.

THE COMMISSIONER: Approximately.

30

MR LAMEY: Approximately. This is one licence I know of that friends of mine have operated and they had no idea of any of these – any of these conditions. When flows reach 800 megalitres per day, a diversion from Booberanna Creek are to cease when the diversion rate are less than the pump.

35

THE COMMISSIONER: I read that as meaning that the permission under the licence is available when the measured flows at some designated place, no doubt, is at least 800 megalitres a day.

40 MR LAMEY: Yes.

THE COMMISSIONER: And then you can take flow to a maximum per day of approximately 150 megalitres.

45 MR LAMEY: Yes.

THE COMMISSIONER: And what is your point?

MR LAMEY: My point is there are no meters on any of that. The 150 megs cannot be measured and the 800 megalitres a day cannot be measured. There's no measurement. So these are old documents, that these licences were created a long time - - -

5

THE COMMISSIONER: So the parameters or limits on the permission, presumably imposed for the public good - - -

MR LAMEY: Yes.

10

THE COMMISSIONER: Are not capable of being enforced, you say, because there is no means of measuring whether the threshold for pumping has been reached.

MR LAMEY: Yes.

15

THE COMMISSIONER: Whether the threshold for pumping has been dropped down or whether the maximum per day is being observed.

MR LAMEY: Yes, so you could never be prosecuted under that, and that pump has a wall, a dam wall across – across that creek. And I've been – the – Norman himself was living just below this dam and wouldn't – he didn't – wouldn't get house water for his family, so 800 megalitres a day has never come past that – that wall. .... have told me he's opened it up, there was a pipe that takes 35 megalitres. So every year he's ever pumped he's never met the 800 meg a day .....

20

THE COMMISSIONER: Has this been drawn to the attention of the Queensland authorities?

MR LAMEY: Yes.

30

THE COMMISSIONER: What has happened, in short, about that?

MR LAMEY: Nothing. They have told me – I spoke with the Southern Director last week who I haven't spoken to for two years, despite numerous written requests to meet with the Southern Director and the Deputy Director General, but this was affecting other farmers who weren't getting beneficial floods. They weren't getting water to their house, they weren't getting water to the villages downstream.

35

THE COMMISSIONER: Downstream on the Booberanna Creek?

40

MR LAMEY: Yes, so their properties rights were being affected. So I just kept chasing this, and they're totally happy not to measure the 800 megs, they're happy. The take – the take is a gravity feed now so it's not a pump that's controlled. Gravity can take an exponential number. The higher the flood, the more water the pipes take.

45

THE COMMISSIONER: Right.

MR LAMEY: So it's another goose that lays the golden egg. No metres on the take, no metres, you can't be prosecuted.

5 THE COMMISSIONER: You draw to my attention that there are limits but you say there are not the means of policing the limit.

MR LAMEY: Yes.

10 THE COMMISSIONER: And you also draw to my attention that you've raised a concern by you that the limits must have been exceeded because there could not have been the threshold reached.

MR LAMEY: Yes.

15 THE COMMISSIONER: You say.

MR LAMEY: Yes.

20 THE COMMISSIONER: But the regulators were not interested?

MR LAMEY: No. I – I put to them you can either have one or the other. You can either have the dam wall or you can have the water licence. You can't have both just for a start. And they say the dam wall has been there for a long time. It's – but that's only all - - -

25 THE COMMISSIONER: You could still have - - -

MR LAMEY: - - - verbal.

30 THE COMMISSIONER: You could still have the threshold daily flow with a weir. It's just that it won't be reached unless the weir is spilling.

35 MR LAMEY: Yes. A simple way of getting close to that 800 megalitres would be put a culvert in the dam wall that takes 800 megalitres, its capacity is 800 megalitres, then they could start taking. When it was at full capacity, it would be a visual trigger, no need for technology or it would be, probably not in your – not lawful in your to 800 megs exactly but it would at least take it from where it is now, which is nothing.

40 THE COMMISSIONER: I understand.

MR LAMEY: So this exists in Queensland. These are – I had to – this is provided by Norman Farming themselves.

45 THE COMMISSIONER: No, I understand. Thank you. Very well.

MR BEASLEY: Anything else?

MR LAMEY: Well solutions.

THE COMMISSIONER: What's that, sorry?

5 MR LAMEY: Solutions.

THE COMMISSIONER: Yes.

MR LAMEY: To these – to the Basin problem.

10

THE COMMISSIONER: Yes.

MR LAMEY: Perhaps maybe these floodplains should be – have a higher level of protection because they're sensitive. We have permitted areas and all this retrospective approval. The genie is out of the bottle – everyone knows they're not policing any of this. And if a structure is left for 18 months and it hasn't been pulled down they're calling it there for life. It's – now, it doesn't need approval so it's only - - -

15

20 THE COMMISSIONER: So you draw to attention that what, in the regulatory world is often called grandfathering may be a very undesirable way of trying to deal with the water resources.

MR LAMEY: Yes.

25

THE COMMISSIONER: In the floodplains.

MR LAMEY: Just because it makes the paperwork easy and the bureaucrats can move on with their job doesn't make it right.

30

THE COMMISSIONER: So benchmarking is obviously important for this.

MR LAMEY: Yes. You've got the squeeze of climate change coming down, you've got the squeeze of – you know, I own bulldozers, I own scrapers, I own earthmoving equipment. What's to say I just don't go out and start – start building things? This is - - -

35

THE COMMISSIONER: The law, I hope, but I understand your point about enforcement.

40

MR LAMEY: Yes, because my moral compass won't allow me. But anyone – the law should be protecting me against people without a moral compass. They should be protecting the people of South Australia and Victoria.

45 THE COMMISSIONER: That is its purpose, you're right. Yes.

MR LAMEY: It's just missing a little bit there. We've got these retrospective banks. There's no – I can't find the framework where they will – even if they're found unlawful whether they can be made to be destructed. I believe my farm is destroyed forever under – the property rights I bought are now changed forever  
5 because someone did the wrong thing, built unapproved structures other than the common law.

THE COMMISSIONER: Well, that's why, I do stress, you mustn't take any legal advice from me, but there is the common law.  
10

MR LAMEY: Yes. I feel sturdy enough to – to go full bore at the common law but what about the person less than me?

THE COMMISSIONER: No, I understand. That is a huge issue, of course, well  
15 beyond this commission's remit, namely access to justice.

MR LAMEY: Yes.

THE COMMISSIONER: It's not possible for me to do anything other than to add a voice to a chorus that it is the difference between the ideal and the practice. You're right.  
20

MR LAMEY: Do you have any questions ..... You know, we're a family, so the family is putting up with this day in, day out, so the things I've spoken about in the last two years, I could've – any other questions for me, Mr Beasley? What about you, Commissioner?  
25

THE COMMISSIONER: No, that's very helpful and your focusing of matters, both by your written presentation and in your explanations to me this morning, and this afternoon, have really been very useful. And it provides us with material by which we can render some abstract matters quite concrete.  
30

MR LAMEY: Thank you.

THE COMMISSIONER: That's of great assistance.  
35

MR LAMEY: Thank you, Commissioner. I appreciate the time that you've all shown me. It's not every day that the little Joe gets to come and address.

THE COMMISSIONER: No. Thank you very much.  
40

MR LAMEY: That's fantastic.

MR BEASLEY: Thank you.  
45

THE COMMISSIONER: So we will adjourn today until Tuesday, 25 September at 10 o'clock.

MR BEASLEY: Yes.

THE COMMISSIONER: In these premises.

5 MR BEASLEY: Thank you. Stop. I'm sorry. I will tender the documents in Mr  
Lamey's brief.

THE COMMISSIONER: Yes. Thank you. And Professor Pitman's.

10 MR BEASLEY: And Professor Pitman's.

THE COMMISSIONER: Thank you.

15 MR BEASLEY: And the document behind tab 2 in the climate change core  
materials.

THE COMMISSIONER: Thank you very much.

20 MR BEASLEY: Thank you.

THE COMMISSIONER: Very well. Tuesday. Thanks, Mr Lamey, very much.

MR LAMEY: Thank you.

25

**<THE WITNESS WITHDREW**

**[1.25 pm]**

**MATTER ADJOURNED at 1.25 pm UNTIL TUESDAY, 25 SEPTEMBER 2018**

### **Index of Witness Events**

ANDREW JOHN PITMAN, AFFIRMED	P-3077
EXAMINATION-IN-CHIEF BY MR BEASLEY	P-3077
THE WITNESS WITHDREW	P-3119
CHRIS ROY LAMEY, SWORN	P-3120
EXAMINATION-IN-CHIEF BY MR BEASLEY	P-3120
THE WITNESS WITHDREW	P-3160

### **Index of Exhibits and MFIs**