T R A N S C R I P T

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into the 2022 Flood Event in Victoria

Melbourne – Friday 10 May 2024

MEMBERS

Ryan Batchelor – Chair
David Ettershank – Deputy Chair
Melina Bath
Gaelle Broad
Jacinta Ermacora
Wendy Lovell
Samantha Ratnam
Rikkie-Lee Tyrrell
Sheena Watt

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John Berger
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WITNESSES

Tony Pagone, Chair, Melbourne Water Review Panel;

Tim Peggie, Melbourne Water Review Panel, and Director, Planning, Ethos Urban; and

Mark Babister, Melbourne Water Review Panel, and Managing Director, WMA Water.

The CHAIR: Welcome back to the hearings on the October 2022 flood inquiry of the Legislative Council Environment and Planning Committee. We are joined by the Melbourne Water Review Panel. Mr Pagone and friends, I will get you to introduce yourselves in a minute.

Before I do I will remind you that all evidence we are taking is protected by parliamentary privilege as provided by the *Constitution Act 1975* and the provisions of the Legislative Council's standing orders. Therefore the information you provide during the hearing is protected by law. You are protected against any action for what you say during the hearing, but if you go elsewhere and repeat the same things, these comments may not be protected by this privilege.

Any deliberately false evidence or misleading of the committee may be considered a contempt of the Parliament. All evidence is being recorded, and you will be provided with a proof version of the transcript following the hearing. Those transcripts will ultimately be made public and posted on the committee's website.

My name is Ryan Batchelor. I am a Member for Southern Metropolitan Region and Chair of this inquiry. I will ask the committee members to introduce themselves, starting with Mr Ettershank.

David ETTERSHANK: David Ettershank. I am the Deputy Chair of the committee, and I am a Member for Western Metropolitan Region.

Samantha RATNAM: Afternoon, everyone. Samantha Ratnam, Member for Northern Metropolitan.

Sheena WATT: Hello. Sheena Watt, Member for Northern Metropolitan.

The CHAIR: I might go to the screens – Jacinta.

Jacinta ERMACORA: Hi. Jacinta Ermacora, Member for Western Victoria Region, based in Warrnambool.

Rikkie-Lee TYRRELL: Rikkie-Lee Tyrrell, Member for the Northern Victoria Region.

Gaelle BROAD: Hi. I am Gaelle Broad, Member for Northern Victoria.

Melina BATH: Melina Bath, Eastern Victoria. Hello.

The CHAIR: Thank you very much. I might ask for the record if you would all introduce yourselves and the organisations, or titles, for which you are appearing here today.

Tony PAGONE: Certainly. I am Tony Pagone. I am the Chair of the Melbourne Water Review Panel.

Mark BABISTER: Mark Babister. I am the Managing Director of WMA Water, a consulting engineering firm.

Tim PEGGIE: Tim Peggie, Director at Ethos Urban.

The CHAIR: Thank you very much for joining us today, some for the first time, others for – I do not know – an encore performance, a repeat or however we want to describe it. We do appreciate you coming back and the work that you have done to assist the inquiry. At this stage I would invite you, should you wish to do so, to make an opening statement.

Tony PAGONE: Thanks, Mr Batchelor. I do not wish to add anything, but I think Mr Babister thought it would be useful to say a few words.

Mark BABISTER: I just think it would be useful to highlight that this review has really brought home the climate change implications from flooding. Climate change used to be considered a future problem with flooding, but it is a 'now' problem with the amount of warming. This flood, based on the latest research, is probably 50 per cent more likely – the 2022 flood – than it would have been historically, because of warming. That is something we should dwell on and factor into planning.

The CHAIR: Sure. Thanks very much, Mr Babister. Mr Peggie, do you –

Tim PEGGIE: No, no.

The CHAIR: We have got a reasonable amount of time for this session, so members will take it in turns to ask questions. I might just start. Mainly for the record, if you might give us an overview of what you have done since the final report was tabled and the evidence you gave last time. Maybe step us through a bit of the process you have gone through to prepare the second addendum to your review, how that has proceeded, just to ground the committee a little bit in that.

Tony PAGONE: Sure. Well, essentially between the first report and the report in April, which we have called the second addendum, there was not a huge amount to do, and the whole of the process that was undertaken is set out as part of the report so that there is relatively clear transparency about what we have done. The first report was in August 2023. Part of the process that had been envisaged by Melbourne Water when we were engaged to do the task was for them to look at the report before it was made public and to meet with us to ask questions that may have required further elaboration, and that led to the publication of the addendum in October 2023.

Then, as this committee will recall, they had me talk to them, which occurred. There was not a great deal for us to do between that and the publication, the availability, of the Jacobs report. When the Jacobs report and their additional work, their modelling, came out we were able to meet again. The committee will recall that of the terms of reference there were two where we had to say initially that we could not answer them because the material was not available, and it was anticipated that the Jacobs modelling and reports would enable us to provide more responses, or meaningful responses, to those two. When the Jacobs material became available, which was I think in April – it was – we met. The material was made available to the experts on the panel. The committee may well want to ask about the mechanics of this because the work of Jacobs involves lots of computer modelling of a kind that I simply do not understand. Let us be clear about this. Whereas less so Mr Peggie but more so Mr Babister gives the appearance of understanding the modelling. As a result of the modelling, there were some questions that the experts – that is to say Mr Babister and Mr Meyer, who is the other water expert – wanted to have clarified about the processes that Jacobs had undergone. So we met with them, or two people from Jacobs. Questions were asked, and that then lead us to producing the report. After the report, again, Melbourne Water spoke to us. There were some questions that they asked about some conclusions that we had drawn. Because of the timing, partially to fit in with the timeframe of being here, there was a note prepared of what had been discussed. I do not know whether you have seen that or not. Presumably it has been published on the website. It broadly coincided with our recollection and our notes of what happened. There were one or two descriptive words which we thought were not quite our words, so we wrote back to them and that is where it has ended.

The CHAIR: All right. We are going to have probably about 7 or 8 minutes each just to ask some questions following that scene setting. I thought I might start. You said that there were two questions you had to answer. Do you think those questions have been satisfactorily answered by the work you have done?

Tony PAGONE: I might leave that for –

Mark BABISTER: Yes, the Jacobs work has allowed us to reliably answer those questions.

The CHAIR: So you have got confidence in the modelling and the work of Jacobs?

Mark BABISTER: The Jacobs work is very good quality – very confident.

The CHAIR: So you think the committee can be confident in the advice we have received from Melbourne Water and obviously in the advice we are receiving from you about the substantive questions that need to be resolved?

Mark BABISTER: Yes.

The CHAIR: Okay. Well, that is good to hear from our perspective, because I think there has obviously been a lot of interest in this topic. One of the reasons why your services were engaged was to answer some questions, and I think it is good for the public but it is good for more broadly the way government operates to have independent processes and be able to answer questions that people have after natural disasters. So I think it is really partly thanks to the work that you guys have done, because it is about giving people and giving members of the public confidence that when things happen, they are properly looked into. The assessment we have is that when there were some questions we needed to ask, they have been answered.

Tony PAGONE: Mr Babister may want to add further to that, either then or in responses to other questions of yours, but the impression I had was that one of the upsides of this otherwise disaster is that there has been a substantial modernisation of the programming material. That had not been the case for a long time. Although things are getting worse for the reasons that were explained in terms of climate change, the fact I think is that Melbourne Water now has available to it through the new programming materials better resources to be able to map and model and understand what is happening.

Mark BABISTER: That is absolutely true.

The CHAIR: It certainly seems – we had a long session with Melbourne Water just prior to your appearance today – that the level of sophistication in this modelling is quite a deal advanced from where we were 10 years ago. Would that be an accurate assessment, an accurate reflection?

Mark BABISTER: That would be accurate, yes. They have moved from a modelling platform that was two generations old to something that is currently used throughout Australia and everywhere; it is the default standard everywhere.

The CHAIR: What do you think the consequences or the implications of that more sophisticated modelling will be in this instance but also more broadly as it rolls out across –

Mark BABISTER: There will be changes in flood levels because they will become more accurate. They will not be perfect, but we will have much more accurate spatial representations of flood levels, and that will lead to better planning.

The CHAIR: One of the things that strikes me in how members of the public now respond to the information that has been received is that we have got a lot of detail, sophisticated modelling – the extent to which it appears that things like the surveys have been done, the measurements, all the inputs, the amount of data that is available to us appear to be pretty comprehensive and sophisticated. In the end, though, it is a model; it is not gospel, but it is giving us the most accurate assessment of risk possible. I want to find out how we think people should feel and respond to the information they are presented with.

Mark BABISTER: Yes, I think that is a good way to put it. The models are never perfect, absolutely accurate, they just give you a better indication of what the true answer is. We will never know the true answer. But what we do is, as well as working out what the levels are, put for planning a freeboard on top of that – that is 600 mils on this catchment for the river – and that means that even if there is an inaccuracy, people will get the level of risk that they think they are getting.

The CHAIR: So there is a buffer, I suppose.

Mark BABISTER: Exactly, yes.

The CHAIR: The model builds in a buffer so that even if we have not got it exactly right, there might be a little bit more that –

Mark BABISTER: Not so much the model but Melbourne Water.

The CHAIR: Sorry. And that means that those people who are now finding themselves – there are maps behind us shaded in areas where they have not previously been subject to flood risk. What do they need to think now about the future and what it holds? How should they respond to this information?

Mark BABISTER: Yes, that is a real issue for those properties that have moved from being on one side of a line to the other. They will struggle to get insurance at affordable prices. So there are real consequences for those people, but also if they do renovate, plan, knock down, rebuild, or other people buy those houses, they can buy those houses or change those houses on an informed basis. But it is also important to keep in mind that it is not like there is a line and there is no flood risk above it and there is flood risk below it; it is just where we have drawn a line and are saying, 'The risk above that is probably acceptable, the risk below that is probably not acceptable.' That line will keep going up in the future with climate change, so we need to factor that in as well.

The CHAIR: So it is going to become an increasing problem, your evidence is – that where people are living near watercourses there are going to be increased risks arising out of climate change?

Mark BABISTER: All round the country, and particularly in urban catchments.

The CHAIR: Thank you.

Tony PAGONE: And this was an urban catchment.

The CHAIR: Yes.

Tony PAGONE: And still is.

The CHAIR: Still is.

Tony PAGONE: And it is not going to change.

The CHAIR: No, that is right. One last point I want to ask. Obviously the mitigation works that were put in place as part of the development of the flood wall in Flemington did not work particularly well – much at all. What lessons can we draw from that, do you think?

Mark BABISTER: Lessons – I think with mitigation works it always pays to be cautious, and that is probably what was not applied at the time. The technology at the time made it hard for them to be definitive, but nobody erred on the side of caution, which was probably the biggest mistake.

The CHAIR: So looking forward, thinking about the future works, future mitigation, obviously the implications of this study are going to lead to a whole lot more work in terms of mitigation measures. There are clearly limits to the extent to which mitigation measures can ameliorate risk. Is that –

Mark BABISTER: Yes. It will lead to some measures, but the reality is with flooding it is really hard and generally very expensive to mitigate flooding and it is really easy to avoid flooding by putting things in the right place. So you have got to get the decision right at the start, and it is very hard to fix it afterwards, particularly on a river. On a little, tiny urban drain it might be possible, but on a river it is nearly impossible.

The CHAIR: A big river like the Maribyrnong.

Mark BABISTER: Yes.

The CHAIR: Particularly one that I suspect intersects with Port Phillip and has some title issues as well.

Mark BABISTER: Yes, that also compounds the issues.

The CHAIR: Mr Ettershank.

David ETTERSHANK: Thank you, Chair. Thank you very much for your report; it was very interesting reading. I guess a question that immediately comes to mind is: a lot of people were rather surprised to see in the modelling the results on Kensington Banks, which went from not even being subject to an LSIO and where people bought less than 25 years ago on the understanding that it was above the flood level. I guess in hindsight I am wondering what lessons the panel has drawn from the process that was employed in approving the flood wall. Are there lessons for the future out of that?

Tony PAGONE: I do not think – do you want to add anything on lessons from the process?

Mark BABISTER: Somebody might need to enlighten me on Kensington Banks.

David ETTERSHANK: Well, Kensington Banks previously was not even on the SES maps. It did not have an LSIO overlap, and we now understand that there are something like 800 houses that are subjected to that. I have a friend whose insurance, immediately after the last flood, went from $5 a month to $5000 a year, so this is having a real impact now.

Tony PAGONE: So I suppose the reason I – the last time you asked difficult questions too.

David ETTERSHANK: Sorry about that.

Tony PAGONE: And you really must not. I do not want to dodge the question too much. We have obviously got private views about stuff, and I will try and say something in response, but that was not really any part of the terms of reference. We were not there to draw lessons more broadly. I suppose my view is not much better than asking somebody down the road. I mean, I have gone through this process, but none of this process really informs the question that you have asked.

Part of the lessons to be drawn is obvious. It was a flood zone. It was a flood plain. That is why we have got a racecourse there. We have got a racecourse there because it was not appropriate to be building on it. There is a temptation to allow building to take place in areas where there had not been building, and the temptation is because we have got an ever expanding community, we need to find land, it is close to the city and therefore people look at what has been happening over a number of years and say, 'Well, it's possibly okay. Let's build.' But I think from what Mr Babister said earlier on in response, and adding that in response to your question, the lessons really are that it is going to get worse; we need to be more cautious. But that will give rise to people saying, 'Well, you're imposing unrealistic hurdles.' Government will be told, 'You should be more willing to allow construction to be built. You should allow more developments to take place.' And eventually you will end up with another big problem.

David ETTERSHANK: Can I ask: in terms of the technical elements of this, the original benchmark that was set for the VRC was the 1 per cent flood. The results that have been provided, in terms of if the flood wall contributed to inundation, were premised on 2022, which was a 2 per cent flood. So does it cause you any concern that in fact we do not have the answer to the original proposition, which is that that flood wall should equate to a 1 per cent flood?

Tony PAGONE: Speaking as effectively a layman with only the benefit of what I have done, it does concern me, but I am not speaking as an expert there. It concerns me because you wonder what would happen if you had a 1 per cent event. What does concern me, again, as a layman – and I should not really probably say any of this – is that there seems to have been nothing in place to evaluate the impact. So when we asked the VRC, 'Well, there would have been an incident report. Did you look to see what happened or whether the mitigation works were being effective?' the answer, in a nutshell, was no. Indeed when we were asked, 'Was it effective?' the answer was, 'Yes, the racecourse wasn't flooded.' But I was surprised that there was not in place some process to evaluate the flow-on impact anywhere and that it took the Jacobs report to come out in April or whenever it was before we were able to get some – you would think that governance would require that there would be a kind of, 'Well, we've done this. Let's make sure that we can evaluate whether we've done the right thing, or do we need to institute other mitigation measures of one kind or another?'

David ETTERSHANK: I guess one of the things that concern me is there would be an argument that could be run based on the 2024 revised mapping, which shows the racecourse getting inundated, that we could be looking to having Melbourne Water saying we need to extend and increase the height of the flood walls, which would be I think rather a disappointing prospect.

Mark BABISTER: I might answer your question a bit differently. You have raised an interesting point. We use this 1 per cent standard for everything – for houses, for businesses and for racecourses. It would be much more sensible if we actually had things like the racecourses at a lower level, so they were inundated, and when the houses were inundated, any impact on people's houses built at the correct level they were told to was minimal. And I would say the same for major bridges and motorways and other things as well. If people have built their houses at the appropriate level in accordance with government guidance, we should try and make sure other uses do not impact them.

David ETTERSHANK: And clearly the racecourse did impact upon them.

Mark BABISTER: Yes. And you could have built the racecourse at 2 per cent and the houses at 1 per cent, and the impacts on those houses would have been much smaller. There would still be an impact.

Tony PAGONE: I hasten to add that he is not a Victorian.

David ETTERSHANK: Can I move on to Rivervue. I am perhaps going back a little bit in time, but I am looking at the response to recommendation 13, which was that Melbourne Water should investigate how it came to be satisfied about the situation at Rivervue. And I am looking at the Melbourne Water response in the April 2024 update, which borders on the metaphysical in terms of suggesting that 'There are things that we still do not know and we accept that we may never know given these are historical events,' with no real answer about what the actual ongoing impact will be, how many future properties will be – you know, 600 – above the flood level. I am wondering, is it acceptable that it is simply cast into the dustbin of history, apparently?

Tony PAGONE: Wonderful questions. You have really got to stop.

David ETTERSHANK: You love it.

Tony PAGONE: I cannot answer. We cannot answer the question of 'is it acceptable', so let us reframe the question so that we can provide a meaningful –

David ETTERSHANK: Well, it was your recommendation that they come up with a meaningful response, and they are basically saying they cannot.

Tony PAGONE: Is it acceptable to us? I suspect that they were answering the question as we understood it, not necessarily the way that perhaps you have. The problem is that there seems to be some uncertainty about how, as a matter of process, there was a change, and that is a factual question. I suspect that they do not know the answer to that. We can guess what might have happened. On one view, somebody has made a mistake. On another view, somebody took the view that it did not matter whether it was a dynamic process or not. We have toyed around with what different possibilities might have occurred, but I suspect that the answer they have given is an honest answer – that they do not know. We do not know, and we have hesitated to speculate, because we just do not know.

David ETTERSHANK: Surely all of those deliberations were minuted, Hansarded or whatever. They were in VCAT; they were in courts; they were in council meetings – they were documented. I mean, has nobody followed the document trail?

Tony PAGONE: Sure. I am not trying to defend them. You have asked me a question about whether our view is that it is acceptable to us, and all I can say is that I think they have answered it as honestly as they can.

David ETTERSHANK: That it is too hard?

Tony PAGONE: That they just do not know.

David ETTERSHANK: Are you satisfied they have looked? I mean it is your recommendation. I am wondering, have they, in your mind, responded adequately?

Tony PAGONE: We tested them as far as we could. I think they just do not know.

Mark BABISTER: I was going to say, it is also very hard to nail this down, because there were a number of contributing aspects to what occurred. It is not as though one decision would have been made differently.

David ETTERSHANK: All right.

Tim PEGGIE: Can I just add to that one. Obviously, there was a level that was set by permits, and at one stage or another there was an acceptance that it could be lowered. That is where the error is, but why that was tolerated or allowed we do not know.

Tony PAGONE: It could have been a small mistake, a simple error.

Tim PEGGIE: And our initial report alludes to that as well.

David ETTERSHANK: I get that. It is just that the suggestion is that it is lost in the mists of time. We are not really talking about that long ago, we are talking about things that were all public and in the public domain or whatever, and it seems like it is just some sort of mystery.

Tim PEGGIE: This is not a defence of Melbourne Water, but it is to add some context. It was a process that went through a number of different decision-makers, referral authorities, over a very long period of time. The first applications were in 2003.

David ETTERSHANK: Twelve years.

Tim PEGGIE: Yes. It was going through final VCAT decisions in 2011 and so on and so forth. I think endorsed plans are still being provided to this day. The length of the development cycle, the numerous landowners, the revision of plans, council being involved, Melbourne Water being involved and VCAT being involved have meant that it is very complex, and that is challenging. To your point: are the records there to determine how it went wrong? There is a lot of information. Having gone through the information we did, there is a lot of information, and some of it is contradictory.

David ETTERSHANK: Thank you for your indulgence, Chair.

The CHAIR: Ms Broad.

Gaelle BROAD: Hello, and thank you very much for coming in. You are our last public hearing for this inquiry. We have had many across the state. You may have heard Melbourne Water present earlier.

Tony PAGONE: No.

Gaelle BROAD: No, okay. There has been a lot of talk about studies and lots of modelling that has been undertaken, and sometimes across the broad we know things up here, and doing things is the question. Locals, I know, in regional areas want to see action and less studies, but what are your thoughts on the action that is being taken or the number of studies? Is work to actually reduce flooding happening quickly enough?

Mark BABISTER: I would really strongly caution against jumping into mitigation measures without actually thoroughly modelling the system. We see this all round the country, where people believe a particular thing will solve their problem, and it might move the problem down the river a little bit, or it might not be anywhere near as effective. We have a process to look at mitigation where we first understand in a very reliable way the existing flood behaviour before we look at solutions, because often solutions do not work as people intended or there are unintended consequences. It is really hard to mitigate flooding without transferring that burden across to another property.

Gaelle BROAD: But given these studies are kind of a rolling thing in a way and we do studies to apply for grants to do further studies to do action – works – in some regional areas, do you think there is a way we can, I guess, make the process faster or reduce that gap?

Mark BABISTER: I acknowledge it is very hard to shorten that process. It does take too long in my opinion as well. But I do not have any solutions. This is something I see all around the country.

Gaelle BROAD: Okay. I am just interested too in your views on Jacobs. When I look at Jacobs – they have done the modelling for Melbourne Water – $16 billion annual revenue, a workforce of 60,000 across 40 different countries, headquarters in the US. Throughout this inquiry we have heard that the impact of flooding is often very localised, that locals do know the knowledge. Do you feel that we are outsourcing too much?

Mark BABISTER: Outsourcing from Melbourne Water or outsourcing to an international firm? Jacobs acquired an Australian firm about 10 years ago that was one of the most respected firms in its field, so they have a lot of really good local talent, and that work was all done in Victoria. They might be part of a global empire, engineering empire, but that work was done by locals.

Gaelle BROAD: Concerns have been raised by hydrologists who do have extensive experience in this field. They said that the Melbourne Water modelling was based on one solitary survey for October 2022 downstream of Maribyrnong township, so they have concerns. What is your response to that?

Mark BABISTER: As part of the work that Jacobs did and the data collection that Melbourne Water undertook, they surveyed a whole lot of flood levels. They have used very accurate ground and river information, so I do not really understand where that question is coming from.

Gaelle BROAD: More concerns were raised about Ascot Vale – that there was no October 2022 flood level observed by Melbourne Water. I guess you are saying you cannot –

Mark BABISTER: I cannot answer the Ascot Vale one directly, but it is normal practice after a flood event to go out and collect as much flood level information. There is usually a mark on people's houses and businesses, and even if they have cleaned up, you can usually find a mark on some spot they have not got to. And Melbourne Water did the standard practice: they went out and surveyed all of these properties, collected all of this data. It is a little bit contradictory because cars drive through water so all the levels will not be exactly the same even if they are next door. So they have done the right process – best practice even. And if people have flood levels, they should be sending pictures to Melbourne Water, and Melbourne Water should be surveying them.

Gaelle BROAD: In your review you talked about the need for Melbourne Water to take into account changes in land use when setting the flood levels for planning and development. When they appeared today I did ask them, 'Does this modelling up to 2100 take into account extra building and development?' and they said 'Not really' – I guess that is the paraphrasing. Given that you did say 'take into account land use', what are your thoughts or response to that?

Mark BABISTER: They really do need to do this. If you think about the question we had earlier, if everybody builds their house at the appropriate level they are told to and then we have a bit more urbanisation and a bit more run-off, we are setting ourselves up for failure, because all those people will move from one side of that line to another. We are much better off factoring in a reasonable amount of future urbanisation and a reasonable amount of future planning and making people build their houses that little bit higher so they do not end up with very large insurance policies. That is our recommendation: they should have a planning horizon that these flood levels are worked out. The response back will always be, 'We don't know exactly where the urbanisation will occur,' and that is true, but you can still have a fair guess at it.

Gaelle BROAD: It is interesting. I have met with residents in the Huntly area, which is not far from Bendigo in central Victoria. The state government has built a huge train station in Huntly in a flood plain zone, and there are locals there, with further development into the region, that are experiencing successive flooding. So on your advice to Melbourne Water about that planning, would you give the same advice to government about the need to plan in appropriate places?

Mark BABISTER: Yes, but what you are describing is a one-off large-scale development, so that might not be picked up.

Gaelle BROAD: Well, yes, it is a train station that is built out in the middle of paddocks, and there is significant growth in that area. I guess that probably wraps up my questions, thank you.

The CHAIR: No worries. Ms Watt.

Sheena WATT: Thank you so much for being here. I just wanted to follow up from Ms Broad again and ask a question about this planning horizon for urbanisation. You said there was a recommendation to that in this report.

Mark BABISTER: We recommended they factor in urbanisation within the catchment.

Sheena WATT: Can you just direct us to that recommendation if you have got it handy? I was just trying to find it as you were speaking to that.

Tony PAGONE: It is in one of the recommendations, so it should be towards the back of the thing. On my pages it is page 119. That is where the recommendations start.

The CHAIR: This is probably the original report – is that correct?

Tony PAGONE: Yes. And it looks like it is paragraph 8.

Sheena WATT: Okay, paragraph 8.

The CHAIR: It was in the original report rather than the addendum.

Tony PAGONE: Yes, the original report.

Sheena WATT: Right, okay. Apologies, I am looking at the final report.

The CHAIR: I can just read it out for the benefit – do you want me to read it out?

Tony PAGONE: Sure.

Sheena WATT: Yes, please.

The CHAIR: 'Melbourne Water should take account of the change in land use and projected changes to land use when setting flood levels for planning and development and the application of the land subject to inundation overlay.'

Sheena WATT: So this recommendation is just directed towards Melbourne Water, is that right?

Tony PAGONE: Yes, it is.

Sheena WATT: I just wonder if there are any other parties that should be considering that recommendation, and if you had any other –

Tony PAGONE: We would be delighted to be able to investigate more broadly. We were asked by Melbourne Water to say something to them about things. We were not trying to be narrow, it was just –

The CHAIR: We are not so constrained.

Sheena WATT: Yes, we are not so constrained, and that is why we are seeking –

Tony PAGONE: And it is not rocket science, is it? All planning authorities that have an impact on giving approvals should take into account everything that bears upon the decision that they are likely to make – simple as that.

Sheena WATT: Yes, absolutely. I appreciate that. Perhaps that is worth our consideration as a committee beyond your direct recommendation to Melbourne Water.

Tony PAGONE: Sure.

Sheena WATT: Perhaps that is something we will consider in our deliberations.

Tony PAGONE: I mean, you can extrapolate from that. If Melbourne Water should do it, everybody else who is going to have an impact should do it too.

Sheena WATT: Yes. Given that this inquiry looks to the flood event not only in Melbourne but across our state, that is something that I am sure we will be thinking about. I wanted to go to – I have got it as page 16, but I am not sure if I have got the same point as yourself. You talked about the duration of the inundation, that construction of the flood wall and associated compensatory works may have contributed to the duration of the inundation in some of the flooded areas.

Tim PEGGIE: Addendum report or –

Sheena WATT: The second, yes.

Tim PEGGIE: That second report, yes.

Sheena WATT: I am just wondering if we could talk about the difference in actual time length of the inundation and what that means. I know you were saying:

> The only areas where the duration of inundation may have been increased due to the construction of the Floodwall and associated … works are at the fringes of the flood extent.

I am just trying to understand the time of the inundation and the impact on the flood wall and what you are getting at with that.

Mark BABISTER: The change in the time of inundation for most locations on the flood plain was quite small. The flood, with or without the flood wall, would have pretty much come up the same rate. So everybody sort of planning to evacuate or move their possessions, it would not have changed that. The peak was a little bit higher and it stayed for a little bit longer, but nothing significant. There is a figure on page 18. But on the fringes, there were areas that did not flood. They would have flooded, so they would have had a substantial increase in their duration from nothing or very small –

Sheena WATT: I appreciate that. You talked about Melbourne Water and your meeting with Melbourne Water and some of the to-ing and fro-ing about what was said in that meeting, and I am just wanting to understand, from the panel's perspective, did you consider Melbourne Water to be responsive to your requests from the panel in the conducting of your work, and how would you say that –

Tony PAGONE: Absolutely, I think they were very responsive.

Sheena WATT: Okay. That is helpful.

Mark BABISTER: Everything we asked for we got pretty promptly – that they could find.

Sheena WATT: I may have some questions that will come up later, and I am happy to come back, Chair, if that is all right, with my time remaining.

The CHAIR: Absolutely. Dr Ratnam.

Samantha RATNAM: Thank you very much for all the work that has gone into providing us with this updated second part of the report. Mr Babister, you made a remark in your opening statement about the 50 per cent or 55 per cent increase in risk of the flood event. Can you just say that again?

Mark BABISTER: The chance of the 2022 flood occurring, say, back in the 60s, 70s, 80s or 90s was about 2 per cent each year. That is the risk each year, a 2 per cent chance. Because of the warming already today it is about 50 per cent more likely. By 2030 it will be about 60 per cent more likely. Depending on what CO_2 emission scenarios we end up on, it could end up, at 2060, at two times more likely and in 2090 it could end up as bad as three times. That is based on the latest research that is about to be rolled out as national practice. They are horrendous numbers. And that is not just this catchment; all catchments are going to be something similar. They will all be a bit different, but –

Samantha RATNAM: Thank you, Mr Babister. They are very sobering numbers, which is why I wanted to capture them accurately. We have another inquiry, which this committee is going to undertake next, which is looking at climate resilience and looking exactly into those questions about all those authorities and our infrastructure deal with this ever-rising threat and how best we mitigate it as well. But thank you for clarifying that. We have had asserted to us by professionals who used to work in the field around some of the modelling or some of the data that Jacobs and therefore Melbourne Water have used in this latest round of modelling, and just because they were talking to the confidence you had in the modelling work analysis that Jacobs had done for this, I wanted to ask if those assertions about some inaccuracies had been put to you. Perhaps you want to take on notice that we have had put to us that the flood level for 1993 should be lower than what you have at the moment – that Jacobs should have used a 3.31 figure rather than a 3.83 metres figure, and then Jacobs used that in the modelling summary report that has been tabled here as well. Has it ever been asserted to you? Have you heard of those contested figures?

Mark BABISTER: I have not heard of that, but I could take it on notice. I would say it would seem to most people that it is quite easy to work out how high a flood got to, but when you try and go back in time it is actually incredibly hard. There is lots of contradictory evidence, usually doing quite an investigative process,

and in the end you basically have to decide what is your best bet on those levels. So it does not surprise me there is uncertainty about floods even that recent.

Samantha RATNAM: Thank you. I appreciate that. I might send a few more detailed questions that have been asserted to us, just for clarification, so that we have confidence in that and we understand the precision as well. We are trying to understand the precision of these models as well. Just following up from Mr Ettershank's former line of questioning particularly around Rivervue – but there are connections to the racecourse wall as well – I understand you dealt with this more in the first report. You talked about the flood wall not having an impact on Rivervue, which is understood, but what we heard this morning as well from Melbourne Water and with the report they have tabled is that the LSIO, the land subject to inundation overlay, performed as expected. That was their view to us. One area that it did not capture, which was not in the LSIO, was the Rivervue Retirement Village, which we know was included historically and then was extracted from the LSIO.

Mr Ettershank was asking questions about how we can get to the bottom of what happened, and I heed what you said, Justice Pagone, about maybe we do not know. Maybe there was an error. Maybe the data is just not there. But we have heard quite different views about what might have happened, and I think Mr Ettershank is right in terms of that a lot of that is documented. So we are grappling with how we cannot know what happened given how much documentation there was at the time, all the appeals et cetera. It was before VCAT and councils et cetera. In your view in looking into this do you have confidence to rule out any other kind of influence? We are grappling with what happened. Was it that people were pushing for this outcome? Was it the developers pushing for this outcome? Have you ruled that out? Do you have confidence you could rule that out? What else is there to explain this? We are wondering: how did this happen?

Tony PAGONE: As you know, I am a former judge and a lawyer, so my instinct is: what is the probity of evidence? I have always been reluctant to draw inferences unless it is probative. We deal with a bit of it at about page 82 of the original report, 136 to 140 or thereabouts, and a plausible answer is that the original level had been set. There is a difference, I am told, between energy levels and surface levels, and that has an impact. I understand that what had happened originally was that the level that had been relied upon, the method you alluded to, was not the usual one for ordinary planning and therefore produced a higher level of confidence. When the issues arose it looked as though somebody might just have assumed that it was the more traditional level that was being used and therefore simply had not turned their mind to it. That is a plausible theory. We did not go into it in any detail because it is just pure speculation. I have got no idea, but it is a plausible theory that somebody just assumed instinctively that it must have been the basis that everyone had been working on in the past. I have not seen anything that would indicate that there had been any external influence to kind of get something through, but I had no powers of investigation. We had no powers to compel evidence. I do not have any of the powers that you have got, so we could not pursue it any further.

Samantha RATNAM: You were bounded by that. Thank you; I appreciate that. I know it is not an easy question. It is because also Melbourne Water this morning indicated that it was the proprietor, the developer, who had applied for the LSIO to be removed when it came to that C151 process or thereabouts. But what we have heard throughout this inquiry was –

The CHAIR: Did they?

Samantha RATNAM: Well, Melbourne Water said that the proprietor did propose for it to be produced.

Tony PAGONE: The then proprietor. That is what I thought.

Samantha RATNAM: That is what they just said before, and that is what sparked my interest in these questions. Prior to that the developer said, 'No, we didn't make an application. What had happened was we'd got the approvals in 2011 – a planning permit subject to conditions. We met those conditions. We did the mitigation works,' and they believed therefore the LSIO should be removed because they had done the mitigation works. I asked Melbourne Water, 'Well, is that what you actually asked them for? Or did you say to them, "Get the mitigation works done? You can start building, but your LSIO is going to remain."' But they seem to insinuate that the proprietor had then asked, as part of that C151 process or thereabouts, for it to be removed. So that is the question.

Tim PEGGIE: They made a submission to the council to remove it, but it was based on the fact that they were of the opinion they were outside the flood plain.

Samantha RATNAM: They were outside the flood plain.

Tim PEGGIE: Yes, and that was based on the fact that the model in the first instance was wrong. So I think there are two aspects, and they are covered at paragraph 143 of the original report. The first one is that there is an issue with the actual, in Maribyrnong, flood level. Mark, you can jump in there and provide some commentary around that.

Mark BABISTER: The model was not calibrated, and that is a really important process. That really makes sure models are going to give you sensible answers.

The CHAIR: This is the –

Mark BABISTER: Original model, yes.

Samantha RATNAM: It was done very quickly, right, in three months or something?

Mark BABISTER: It would appear they took the parameters from the lower model and just used them in the upper model, and that led to these mistakes.

Samantha RATNAM: Is that Melbourne Water or GHD at the time who did that?

Mark BABISTER: GHD.

Samantha RATNAM: GHD. So is anyone culpable? Is anyone responsible then if they did not calibrate it? I know this is tricky territory. Is anyone responsible?

Mark BABISTER: Let me not answer your question. You would have to ask who directed who to do what.

Samantha RATNAM: Who directed who to do what? Okay, thank you. I have run out of time.

The CHAIR: It is all right. You are under privilege, so you can say whatever you like.

Mark BABISTER: We do not know why that process was followed.

Tim PEGGIE: Having that model at the wrong level to begin with meant that the freeboard that is normally applied thereafter was lowered as part of this request. Normally the freeboard would cover what you had lowered and you would not end up flooding, but because the model was too low to begin with, you started to get below, and hence the event.

Tony PAGONE: It was not so much that the freeboard was lower, it was that the freeboard was lower down.

Tim PEGGIE: Yes, correct.

Tony PAGONE: It was still the 600 mil or whatever the mil was, but it was just lower down.

Samantha RATNAM: Lower down, okay. Thank you. Is my time done?

The CHAIR: It is. I mean, I do not want to –

Samantha RATNAM: No, that is fine. It is fine. Thank you.

The CHAIR: Ms Bath.

Melina BATH: Thanks, Chair. Thank you very much, gentlemen. Thank you for your collective wisdom. I have got a fairly straightforward one: we are about to make some recommendations to the Victorian government and I would like to tap into your collective wisdom about the recommendations. Your investigation review was finite with your specific terms of reference, but we have got a fairly large pond to work through. Can each of you, or can you collectively, give us, this committee, a couple of recommendations that we should tell the Victorian government that they should do?

Tony PAGONE: Sure. Mark, do you want to start?

Mark BABISTER: I go back to my climate change opening comment: we need to be basing our planning decisions on some plausible future climate scenario, not historical information, because otherwise we are just plain wrong and then we have to live with those decisions.

Tim PEGGIE: I would just say you should be doing as good a modelling as you possibly can and do it asap. It is obvious that some catchments were out of date – Maribyrnong catchment had a model that was 20 years old. It was not fit for purpose, and it should have been done more recently than that. And that is one of the models, so the question is: where are there other models that are not up to scratch?

Tony PAGONE: Some of it really is a funding issue, and the only thing I would add to the funding issues is a bit more attention to governance kind of questions. I mean, I do think it is odd that when an event occurs you do not have faster answers to how it happened. I know this will doubtlessly upset the VRC, but I do think it is a bit odd that the VRC does not really have an obligation to find out whether what it did and the mitigation works that it had done were effective, because the VRC is not a private individual. I might be able to get away with it around my house, but when it has gone to the trouble of building a wall which will inevitably have an impact, you would think that governance issues might require that there would be some additional requirement to come up with monitoring, answering, to make sure that what it has sought to achieve, subject to a condition, is working in the right kind of way, and that maybe there ought to be additional obligations imposed upon it.

Melina BATH: Thank you. Thank you very much. In respect to the VRC, do you feel that there was an element of a bit of setting and not necessarily oversight – I am not saying setting and forgetting – but getting on with their core business rather than having a productive plan, or is that something that you have not got oversight of?

Tony PAGONE: I do not know. I know that there was an incident, and if incidents occur, there is usually a report of the incident and people are usually concerned to ensure an understanding of the impact of the issue.

Melina BATH: Sure, absolutely.

Tony PAGONE: So far as I was able to see, the VRC did that in respect of its land and not in respect of the impact that what had happened on its land had on other people.

Melina BATH: Thank you. Through my head, I always have a country focus, a regional lens. You have mentioned 'model before mitigation' and 'model the model' and 'good modelling', and I have got that 'at what cost?' We are making recommendations to government. We have got roads in regional Victoria and, I am sure, in Maribyrnong that have been undermined to the nth degree because of floods. And without a build back better response we are not really fortifying against new flood events, we are just waiting for the next one to take the roads systems away, so there becomes that balance. This is a hypothetical arrangement I am just sitting on right now between funding an in-depth study and funding a road to drive transport down and help people to schools et cetera, so there is that balance. Now, how does government strike that balance? That is too big a discussion potentially, but I want you just to give us your thoughts on that.

Tony PAGONE: There is, you are right, a balance, and somebody has got to make a policy decision about where you put the balance. I would like to see evidence of the balance being considered so when the decision is made, even if it is a decision that we do not like, at least we know that the process has been gone through. I think most people understand the need for balance and the need for cost–benefits and that you cannot have everything in life, but it would be nice to be confident that the process had been undergone and that somebody said, 'Look, I understand. That's where I'm going to draw the risk.'

Melina BATH: Sure.

Tony PAGONE: Do you want to add to that?

Mark BABISTER: I think that is a really good example. Raising a road as a build back better can seem like a very good thing for a community, but there could be consequences. Roads across rivers back up floodwaters, just like a flood wall does. But somebody making a decision could get advice from an experienced flood expert, who probably could say, 'That probably won't make any difference,' or 'You want to be careful there and do a proper study.'

Melina BATH: And I am conscious I have got Carensbrook – I think I have got that right. Help me out.

Gaelle BROAD: Carisbrook.

Melina BATH: Carisbrook in mind. There will be people there that say that there was a particular road built that could have had better structures through it to enable the road to exist and enable flood functioning, we will say, or flood mitigation or a flood response to exist as well. My time is nearly up – are we done?

The CHAIR: No, you have got a bit of time. I forgot to start it, but you have got some time.

Melina BATH: Thank you. I am not sure if I was here because I am on three other committees, so forgive me if I am re-covering other territory – but I am really keen about forecasting. Yes, we have models, yes, predict, but when the rain is sheeting down – and I know some of your recommendations – the importance of that timely monitoring and timely forecasting and then disseminating that information to volunteers, to residents, to councils, to all of them, first responders et cetera. Could you I guess indulge me with an update on what you feel that we still need to tell government to do in relation to forecasting and information?

Tony PAGONE: Sure. Do you want to have a shot at that?

Mark BABISTER: Yes. Melbourne Water are committed to dramatically improving the timeliness of their forecasts and moving some of their processes to the Bureau of Meteorology, who does that on a national basis. So they will make dramatic speed increases in getting forecasts ready to disseminate. A lot of the parties have learned from this exercise, and they will be making efforts to do that, because it is quite a complex process – somebody has a forecast; another organisation like the SES works out what the consequences are –

Melina BATH: Interprets –

Mark BABISTER: Interprets it. And then it moves down to the people on the ground, which could be council staff, could be home owners packing up their goods. So there are lots of steps in the process. The biggest problem is that we do not have floods – they only occur occasionally – and all of that information gets lost. If it is 10 years later, people do not see the importance, or the focus has moved. And the other side of the coin is forecasts will never be perfect. You need to have a resilient process where you can adapt. Forecasts are getting better and better, but they are never going to be perfect, and there is always going to be a lot of uncertainty in them. We have all been out and seen the weather change dramatically. So it is important, but it is not a total solution.

Melina BATH: Yes, it is the rearguard action – well, it is not, but there are all of the other effects that need to be put in place first. But I think for people on the ground and those emergency responders and volunteers it is really important that that chain of events works successfully and efficiently.

Tony PAGONE: I completely obviously agree with what Mark said and adopt it. A lot of the problems were with speed. There was some misinterpretation of what had happened. We know that everybody had gone to bed thinking that it was going to be a wet night but okay, and then not long after it turned out to be a lot worse. There are some lessons to it – speed and improved technology are better – but I suspect there is always going to be some mistake made along the way, just like the example of the lorry, the truck, that was allowed to travel causing great damage to somebody's businesses with the windows breaking down, because somebody made a mistake. That should not have happened. But there will always be mistakes.

Melina BATH: It is how to prepare, who is in charge and what eyesight they have on those people making those decisions, and the community need to have confidence.

Tony PAGONE: Correct. Absolutely. I completely agree.

Melina BATH: Thank you.

The CHAIR: Thanks, Ms Bath. Ms Ermacora.

Jacinta ERMACORA: It is fascinating getting to the end of this process. I cannot resist sort of going higher level in a way. I guess my observation is that usually an inquiry is perhaps an investigation into something to try and ensure that it does not happen again, but this is something that we know is going to happen again, and

so it is more about the detail – was the information useful and was the emergency response timely and effective and all that. I guess with mitigation is where I want to start. I think mitigation is probably different in the Murray–Darling Basin to what it is down here in the south of the divide, because in the Murray–Darling Basin we have already turned our rivers upside down. We have stopped them flowing when they used to flow, and we have sent the water down when they do not normally flow. That is for agricultural purposes, and that is a massive generalisation, but there is a lot of infrastructure that reflects that. Mitigation is about that existing infrastructure, isn't it? With mitigation in Maribyrnong, it seems to me that you have got a range of players to prevent or minimise the impact of the flooding when it happens again. You have got local government, you have got Melbourne Water and you have got private owners, and it seems to me it is not possible to stipulate retrospectively what owners should or should not do. I think our members mentioned lifting floors or building in the first place at the right height. Is it a fraught area to try and decide how to mitigate effectively without causing more harm? Sorry – long question.

A witness: What is the question?

The CHAIR: Do you want to just repeat the last bit of the question again, Jacinta?

Jacinta ERMACORA: The question is the last five words. Is it a fraught area to try and do flood mitigation that actually prevents the situation worsening?

Mark BABISTER: We have a national process that all of the states follow to look at mitigating and managing flood risk, and Melbourne Water follows that process. But as I said earlier, there are very few things you can do to mitigate the floods – to lower the flood level – and pretty much everything that would work on this catchment would have huge environmental consequences. You could build a big dam upstream – nobody is going to sign on for that. You could channelise the river and make it really ugly – nobody is going to sign on for that. So you are really left with planning and helping people make their properties more flood-resilient. Raising people's houses in those really flood-prone areas would make a big difference. Buying back the houses in the extreme risk areas would make a big difference. Grants for people to make their houses more flood resilient would make a big difference. Changing the planning policies, which often gets overlooked, to encourage people – sometimes you can encourage further densification but smarter housing. If you let people densify but you put houses up higher, you actually can get a more resilient community without having to pay for it. So there are options, but they are all hard and they are complex, and they often involve government funding.

Jacinta ERMACORA: Thank you. That was an answer to my question, because flood plains are definitely like a bathtub. Everybody is in that bathtub and if you raise up one area, the rest of the area goes up as well, so that smart adaptation sounds very sensible. Also, I am wondering about balancing that tension between a landowner's right to develop their land and protecting the community from flooding impacts, whether that is concreting a backyard or whether that is actually stipulating appropriate development. Is that a reasonable encapsulation of the tension?

Mark BABISTER: Yes.

Jacinta ERMACORA: For instance, an appropriate development of some land might be to use it for an unfloored stock shed or to put in a playground so that floods can go through versus building homes on it.

Tony PAGONE: Yes. And that is partly done already.

Mark BABISTER: A really good example of the challenges you have in this area: you could have a house in Maribyrnong that is a little bit low or a lot low. It could be a three-bedroom house and they have now got an extra child and they want to put a fourth bedroom on. Do you let those people build a fourth bedroom at a low level or do you say, 'No. You'll have to squeeze into three bedrooms or you'll have to move somewhere else'? You cannot be absolute about these things. I think it is probably reasonable to let somebody have an extra bedroom for their family, but they should be doing it in a very informed way about their flood risk.

Jacinta ERMACORA: I think that is exactly the question. In terms of concluding around flood mitigation into the future, it really is a complex space and it is also a potentially expensive space and a potentially contested space, isn't it?

Mark BABISTER: Yes, and there is very rarely one single option that is going to work. It is usually a combination of different components to get you the best outcome. Often when we solve problems we really want the single option that will make it all go away, but that is very rarely the case.

Jacinta ERMACORA: Yes. I think that is all I have got at the moment.

The CHAIR: Not a problem.

Jacinta ERMACORA: Thanks.

The CHAIR: Thanks, Ms Ermacora. We have got a few minutes to go so I will let members of the panel ask a couple more questions. Mr Ettershank, did you have something you wanted to –

David ETTERSHANK: I do have a few; thank you, Chair. Mr Babister, you talked really interestingly about a buffer for urbanisation being part of what has to be built in. Looking at the 2100 mapping, my understanding is that that is really just taking into account two factors, which are intensity of rainfall and increase in sea level. Is it your understanding that that model we have been provided with actually does include that buffer for urbanisation?

Mark BABISTER: It does not is my understanding.

David ETTERSHANK: Okay. Thank you.

Mark BABISTER: I might add too that the previous 2100 estimates have turned out to be way under – we are pretty much at those 2100 estimates now.

The CHAIR: When would those estimates have been done?

Mark BABISTER: The advice that is still the recommended advice, that is what they have used – the 2100 estimates – but the new advice that is about to be formally published this month, next month or something like that says that we are at that point on a small urban catchment in 2030.

David ETTERSHANK: Okay. So that is the new edition of the ARR that is coming out in the next –

Mark BABISTER: Yes.

David ETTERSHANK: Well, that is my next question.

Mark BABISTER: It is available in draft already.

David ETTERSHANK: Beautiful; okay. Can I ask you: in terms of flood damage, there is the question of height of water. There is also a question of velocity of water. In neither the Melbourne Water report nor your review could I find the word 'velocity' or speed of water mentioned.

Mark BABISTER: Most of the flood damage is really just a straight function of the depth. If you think about your house, once it goes over your carpet or, if it gets a bit higher, your electricals, or if you have got modern furniture, that all falls apart, and if it gets to your kitchen, there are big damages. Velocity can affect the structure, so in some places with very high velocities you will factor that in because it can actually fail the house.

David ETTERSHANK: And my understanding is something like a long, flat structure such as a flood wall will increase the velocity, as opposed to if the water is just flowing into a big bloody paddock like the racecourse.

Mark BABISTER: Yes. That is what the flood wall does, it pushes the water back into the river and speeds it up so it has got more velocity, but it probably will not make a significant difference to the velocity on any properties, except for those immediately downstream.

David ETTERSHANK: Like at Kensington Banks. Yes, okay.

Tony PAGONE: We may not have used those words, but that was implicit in, as explained to me when I was asking about the difference between energy level and surface level, that those issues were – we certainly were aware of the difference and it was incorporated.

The CHAIR: So you think that you dealt with the velocity concept in your discussion of energy in the report, rather than using the V-word?

Tony PAGONE: We did not use the V-word, yes.

The CHAIR: But the concept you think you have –

Tony PAGONE: The concept was certainly – I recall asking my experts about it for sure, yes. Absolutely.

David ETTERSHANK: But it was not considered in the context of the new flood model?

Tony PAGONE: I think probably not, no.

David ETTERSHANK: No. Okay, all right. Can I just ask one other question; in terms of that 2100 model, I think people look at that and they go, 'Oh, 75 years down the track.' Is there anything methodologically unsound about looking at those 2100 things and saying, 'Well, here is where we might be in 25 years, here is where the levels might be in 50 years, here is where they might be in 75 years,' so that people can have a sense of the progress of that encroachment rather than just where it is going to be, potentially, in 75 years?

Mark BABISTER: That is normally what you would do in a study, you would look at two or three time horizons.

David ETTERSHANK: So that would be perfectly reasonable request to ask of Melbourne Water?

Mark BABISTER: Yes.

David ETTERSHANK: Okay. Thank you.

Mark BABISTER: And keep in mind, these are not certain. We do not know where we will end up in terms of CO_2 emissions, but nearly all the time, if you plan ahead, you end up with a much better outcome, even if it does not turn out to be quite as bad as you thought.

David ETTERSHANK: Okay. Thank you.

The CHAIR: Good. You all right? Anything else?

Melina BATH: Just one.

The CHAIR: One?

Melina BATH: Yes, thank you. This is a question outside the realms of the topic today, but: is Victoria growing enough expertise, in your opinion? Have you seen anything in your investigations in relation to flood experts or modelling experts or planning experts – is that something that you have come across in the course of your investigation? If you look at this, we are going to have to grow more or bring in more experts in this field to counteract climate change. Will there be enough workforce there?

Mark BABISTER: There is a shortage of professionals in the flood space in all the engineering-related areas, and lots of people come in from overseas. That is a national problem. But Victoria has a very good, healthy flood management community and you are in a much better position than a lot of other jurisdictions because you have very healthy process for looking at floods and managing floods. It does not always work, obviously, but you are in quite a good position compared to some states.

Melina BATH: Thank you.

Tony PAGONE: And floods are not unique to Victoria, there is expertise right across the world. It would be really interesting to find out the extent to which there is communication between Victorian experts and the experts in different parts of the planet.

Melina BATH: Value-add, collectively. Thank you.

Gaelle BROAD: If I could just ask a question. You were saying earlier, Mr Babister, that the modelling that has been put forward about the 2100 model – was it out of date because of the national modelling that shows a different –

Mark BABISTER: It is just that the national guidance is just about to change.

Gaelle BROAD: Okay. And I have heard you talk about your best bet with variable flood modelling, but we are investing a lot of time and effort and energy and resources into modelling; are there other countries doing the same sort of predictive modelling with their planning, and where is that being undertaken?

Mark BABISTER: The process we use is pretty similar in most of the Western world. In Australia, particularly Victoria and New South Wales, we are a long way ahead of most of the world. But a similar process happens in the UK and a similar process, probably not quite as good, in most of the US. Europe has a relatively similar process as well. The big thing we need to understand about Australia is our climate is much more variable than most of the world, and that means that is why we are a leader, because we have got a bigger problem and we have got such dramatic change. That is why we have got so many embedded flood problems, because we were settled from a place that had much more reliable climate.

The CHAIR: That is a really interesting point: that we are learning in faster and better ways because of the variability of our climate and that it sets us apart from the rest of the world. We cannot rely on people's experiences from Europe to guide what we do here, is that –

Mark BABISTER: When people first colonised Australia, they came with an English mindset where when it floods the river comes up a little bit. There are places where people have moved their houses up the bank four and five times as they adjusted to Australia's conditions. It was quite a dramatic change. The other thing that is quite scary when we look at paleo information, there is a whole lot of different ways to try and work out past climates. It would appear that the last 250 years have been pretty benign compared to the last thousand in terms of drought and wet periods, so it could be even worse.

The CHAIR: I was hoping we would end on a more positive note. I might come back. Do you have any final things you wanted to ask, Mr Ettershank?

David ETTERSHANK: Damn straight. The revision to the ARR that you referenced, and I am sort of interested in this in the context of – we have literally cheek by jowelled this inquiry with the next one, and I think Melbourne Water alluded to the fact that they would not be surprised if there were significant changes in the ARR. Having put in place all of the Jacobs firmware, hardware, software, nanu nanu, is it a major or is it a timely process to then update that if there are major changes to the variables?

Mark BABISTER: It is not that hard. It would take probably less than a month – it would take a couple of days to run the models, produce some maps which is quite expensive, produce reports – so they could tell Melbourne Water within a month and they could have a published document within a couple of months on what those changes will be. It is not hard. That is one of the beauties of models: you can put higher rainfalls in, push a button, wait a day or so, get some results.

David ETTERSHANK: Okay. But then the actual question of factoring in the urbanisation element you raised, that it is I presume far, far more problematic?

Mark BABISTER: Yes, that is hard. You have got to make lots of planning decisions, and often it is quite controversial to say we are going to urbanise in this area, because that might not be government policy.

The CHAIR: Just on that, given it is a projection about what might happen in the future based on a range of different policy settings, how would you go about doing that?

Mark BABISTER: I would speak to a planner, and I would ask them to speculate on where we will end up under the current proposed future.

The CHAIR: If you were including something that has such a degree of variability, then you would expect the model to increase its range of expected outcomes.

Mark BABISTER: Yes, but you could come up with a high growth and a low growth scenario, just like we do with population projections. You could run both and you could see how much difference it makes. Urbanisation has been quite a problem, but it is a much smaller problem going forward than climate change just because climate change is such a big problem.

David ETTERSHANK: There is a synergy between the two?

Mark BABISTER: Yes, they do compound.

David ETTERSHANK: So I guess in terms of a practical application-type question, it could be to whoever, if we look at the Maribyrnong, we are talking four local government areas, four different councils, four sets of planners –

Tim PEGGIE: Probably more I would suggest if you take into account the peri-urban regions as well.

Mark BABISTER: More than four, yes.

David ETTERSHANK: Okay. They get half a dozen. Is it realistic to be able to have decision-making at that council level, or six or seven or however many councils? Do we need to start looking at having a sort of catchment-wide approach to questions of urbanisation and infrastructure?

Tim PEGGIE: Yes. I will say that the Maribyrnong catchment is still urbanising. Sunbury, for instance, is part of the Maribyrnong catchment. That is going through extensive urbanisation. Getting up to Lancefield, Romsey, they are all part of that catchment and they are all growing towns. That is going to continue to happen. Then even in the other catchments you have got densification occurring. These scenarios are interesting in the sense of what is existing and known versus what is potential as well. Mark will say this to you, that doing these studies on a catchment basis is clearly –

Mark BABISTER: It has to be done on a catchment basis.

David ETTERSHANK: It has to be done. You cannot even look at it. The floodwaters are not going to respect an LGA boundary.

Mark BABISTER: You have got a very good strategy down here, where Melbourne Water is doing the flood modelling on a catchment basis. Imagine the chaos if it was being done on a council basis, which is what happens in other jurisdictions.

The CHAIR: So that is a tick for our governance arrangements.

Mark BABISTER: Yes.

David ETTERSHANK: Take the four points, Chair.

The CHAIR: Hey, I will take whatever I can get. But it is important that we reflect that if we had constructed these governance arrangements in different ways, we would potentially be compounding a problem that we are trying to solve, right?

Tony PAGONE: That part of the structure is undoubtedly very good – that part of it. The resource question may not be so good, but that part of the structure is, theoretically, which ironically is why in relation to Rivervue the original assessment was really sound. And had they kept it –

The CHAIR: The one pre the C151 or whatever it was?

Tony PAGONE: That is right.

David ETTERSHANK: Can I just ask one final sort of catch-all question – we have got a couple of minutes: having been through this journey, are there issues that play on your mind or that sit in the background that do not necessarily fit tightly within the terms of reference that you think the committee should be aware of in terms of moving forward?

Mark BABISTER: The one thing I see whenever I look at flooding, when a flood has occurred, particularly when you have a very big flood or it is quite wide, is that the social impact of flooding is really always underestimated. In a small flood, if a small number of people on one catchment get flooded, they have to find alternative accommodation, they have to find builders. When you have a really large flood event over a really large area, all of these social problems compound. People cannot get to school, people cannot get to work, people cannot get tradesmen, the costs of everything go through the roof –

Melina BATH: Infrastructure.

Mark BABISTER: Infrastructure, and mental health – these things are never factored into the costings.

Tony PAGONE: That is absolutely right. The discussion we had with people at Rivervue affected us in terms of the impact on elderly people who were at a stage in life when they would have been relatively comfortable and secure, and some of the people were telling us that every time there is a drop of rain they become very anxious about it. That is a serious impact, and it is certainly not part of Melbourne Water's remit to be concerned about things like that – correctly so.

There are lots of those kinds of issues that really come to mind, but that is obviously one of them. The relationship between Melbourne Water and the Bureau of Meteorology is another one. The relationship could have been much more fluid, to use a metaphor, than it has been. How messages got out to the public is an issue to be looked at. There is a big trade-off between whether you are overly cautious in the warnings, which causes everybody to freak out – it is a really difficult balance, that. If you told everybody before they were going to bed that they were going to have a real problem, you would have had different outcomes – and what is more, had there not been the flood, everybody would have been complaining that they had been inconvenienced.

Mark BABISTER: And they would not have taken the warning on the next flood.

Tony PAGONE: Exactly.

The CHAIR: They are all very good points and challenges we are going to have to deal with.

Tony PAGONE: The answer is that there are lots of questions, and I am pleased that they do not fall on our shoulders.

The CHAIR: Thank you for the work that you have done. Thank you for the evidence you have provided to the committee today. You will receive a copy of the transcript to review before its publication. With that, today's hearing and the hearings of this inquiry are now closed.

Committee adjourned.