

TRANSCRIPT

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into the 2022 Flood Event in Victoria

Melbourne – Wednesday 25 October 2023

MEMBERS

Sonja Terpstra – Chair

David Ettershank – Deputy Chair

Ryan Batchelor

Melina Bath

Gaelle Broad

Wendy Lovell

Samantha Ratnam

Rikkie-Lee Tyrrell

Sheena Watt

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John Berger

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Evan Mulholland

Rachel Payne

WITNESSES

Andrew Fennessy, Deputy Secretary,

Michael Jensz, Executive Director, Statewide Infrastructure and Rural Strategy, and

Jesse Rose, Executive Director, Water Resource Strategy, Water and Catchments, Department of Energy, Environment and Climate Action.

The CHAIR: I declare open the committee's public hearing for the Inquiry into the 2022 Flood Event in Victoria. This public hearing is for the Environment and Planning Committee, an all-party committee of the Parliament looking into the October flood event. We will be providing a report to Parliament which will include recommendations to the government. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the various lands we are gathered on today, and paying my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee. I welcome any members of the public in the gallery and remind those in the room to please be respectful of proceedings and to please remain silent at all times.

For those of you that are giving evidence for us today, all evidence taken is protected by parliamentary privilege as provided by the *Constitution Act 1975* and provisions of the Legislative Council 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 this hearing, but if you go elsewhere and repeat the same things, those 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. Transcripts will ultimately be made public and posted on the committee's website.

At this point, I will take the opportunity to introduce myself to you and for committee members to also introduce themselves to you. My name is Sonja Terpstra, and I am the Chair of the Environment and Planning Committee. I am also a Member for North-Eastern Metropolitan Region.

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

Melina BATH: Hello. Melina Bath, Eastern Victoria.

David ETTERS HANK: David Ettershank, Melbourne metro west.

Wendy LOVELL: Wendy Lovell, Northern Victoria Region.

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

The CHAIR: Great, thank you. With that, I ask you to commence your opening remarks. I understand you have got about 10 minutes to make those opening remarks. That will allow approximately 12 minutes for each member to ask you questions. We may have little bit more time as well because there are a few members who are not here today, but I will prompt you as you get towards the end of your 10-minute opening remarks. If I could also ask you to please state your name and the organisation you are appearing on behalf of for the Hansard record. Thank you. Over to you.

Andrew FENNESSY: Okay. Thank you very much, Chair, and thank you very much for the invitation to come along here today to talk to you. I would also like to acknowledge the traditional owners of the country on which we are meeting today, the Wurundjeri people, and pay my respects to elders past and present.

My name is Andrew Fennessy. I am the Deputy Secretary of Water and Catchments within the Department of Energy, Environment and Climate Action. I am here to talk to you today about the roles and responsibilities of Water and Catchments in the 2022 floods and to use this process as a way to continually improve flood

management in Victoria. With me today I have Mike Jenz, who is the Executive Director of Statewide Infrastructure and Rural Strategy – he will be able to assist in answering questions in respect to engineered flood mitigation infrastructure and also to the flood plain management strategy – and Jesse Rose, who is the Executive Director of Water Resource Strategy, who will be able to assist in answering questions in respect to Victoria’s water entitlement framework and also storages.

Before proceeding with the opening statement, I would like to recognise and thank all volunteers, local councils and agency staff who have worked tirelessly to keep people safe during these floods. I also recognise that one year on there are many people who are still feeling the ongoing impact from last year’s floods and appreciate that nearly one year on we recently experienced heavy rainfall and flooding in both the north and south of the state, including in areas that saw flooding last year, and that has caused increasing anxiety for communities in these particular areas.

In respect to a flood event, the water sector plays a key support role to the Victoria State Emergency Services, or SES, who is the control agency. The Water and Catchments group has specific roles and responsibilities under the state emergency management plan, known as SEMP, as the control agency for four class 2 water emergencies such as dam safety and water and wastewater service disruptions. In respect to flood plain management, Water and Catchments within DEECA leads the development and implementation of the *Victorian Floodplain Management Strategy*; is an investor in flood mitigation measures, including infrastructure and warning systems; is responsible for the development and maintenance of the state’s flood intelligence platform FloodZoom; and is the coordinator for the Victorian water monitoring partnership that covers flood gauges. Victoria’s water sector, being the water corporations and water catchment authorities, has its own roles and responsibilities under flood management.

The DEECA water team was active in the state control centre for 40 days, providing control and support roles such as the deputy response controller and water service specialist. 24 staff contributed to a total of 191 shifts while the water team was activated. During the flood event the water sector contributed approximately 140,000 hours and responded to over 220 incidents ranging from small dam safety events; inundation of assets, including sewage pump stations; fish death incidents; sewer spills; and water service disruptions.

In planning and preparedness activities, Water and Catchments leads the policy development and oversight of *Victorian Floodplain Management Strategy*. The *Victorian Floodplain Management Strategy* sets the framework on how Victoria undertakes flood planning and mitigation. The strategy was developed having regard to two main reviews: first, the Victorian flood review of 2011 known as the Comrie review, and second, the Victorian parliamentary inquiry into flood mitigation infrastructure in 2012. These reviews followed large floods within northern Victoria, including places like Rochester, and revealed a need to work with communities to involve them in flood planning and flood response.

Crucially, those reviews highlighted the need to clarify the roles and responsibilities and accountabilities for flood warning systems and the management of flood infrastructure. The reviews also highlighted gaps in the flood warning system that needed to be addressed, that improvements in flood planning were needed, that capabilities needed an overhaul, that the entire approach to flood intelligence needed updating and that Victoria needed a clearer framework for future and sustained investment in flood mitigation. The Victorian government responded to the 2010–12 floods and these reviews by acting on recommendations through business planning and incorporated learnings and recommendations into the development of the *Victorian Floodplain Management Strategy*, which was released in 2016 after two extensive rounds of consultation on earlier drafts. DEECA has supported Melbourne Water and nine CMAs with flood plan management responsibilities to develop a total of 10 regional flood plain management strategies, which translate the policies and accountabilities and actions of the Victorian strategy into regional priorities for action at the local level. We also supported agencies such as CMAs, water corporations, local government authorities, VICSES and the Bureau of Meteorology in implementation actions under both the state and regional flood plain management strategies.

The *Victorian Floodplain Management Strategy* provides a structure in which to keep the work program for flood management continuing between events no matter how much time passes between events. Between 2010 and 2023 this resulted in a total of \$87 million already invested in locally led flood mitigation projects. That is \$33.9 million from the state, \$25.6 million locally and \$28 million from the Commonwealth government. This has seen 161 new flood studies completed; 91 flood mitigation measure projects, such as Carisbrook and Rochester South levees; and 65 flood warning projects. A new flood warning system for Skipton went live on

10 October 2022. The township received its first ever formal warning only a few days later as the Mount Emu Creek rose from moderate into major levels. A 2020 audit of the 56 actions in the *Victorian Floodplain Management Strategy* shows 100 per cent of it being completed or alternatively business as usual. The *Victorian Floodplain Management Strategy – Implementation Snapshot of 2022* is a public document and provides a summary of the results of this audit. In summary, the *Victorian Floodplain Management Strategy*, which was developed after the last major floods, has been effective in documenting the roles, responsibilities and accountabilities for agencies; an increased number of communities understand their flood risk through access to flood maps and other flood data; an increased number of communities are accessing flood warning services tailored to local conditions, supported by investment in new flood gauges; communities are now leading decisions about whether or not to implement flood mitigation infrastructure projects; communities are able to secure funding for flood mitigation measures, as evidenced by the Commonwealth's recent announcement over the last 24 months of \$12 million into new levees; and the FloodZoom flood intelligence platform is recognised across the flood response sector as Victoria's single authoritative flood data interpretative system.

The development of regional flood plain strategies was a key deliverable under the state strategy. Collectively the regional flood plain management strategies identify mitigation priority actions. Of these, 299 are complete, and 345 are in progress and are expected to be completed over the next 18 to 24 months. Examples of completed priority projects include the design and construction of priority flood mitigation works at Carisbrook, Dunolly, Quambatook and Woodend and completed studies for several settlements including Kyabram, Katandra West, Kilmore and Granite Creeks catchment.

We continue to learn from every new event. We know following this event from our own after-action reviews, speaking to the community and submissions to various inquiries, that there is interest in matters such as the state's levee policy, how water storages are managed, the flood gauging network and public-facing flood information, so we have commenced work in the following areas: further investment into flood studies – \$10 million over five years, including providing funds to Campaspe shire to review the *Rochester Flood Management Plan* with support from North Central CMA; the levee assessment program – \$22.7 million over 2023–24; assessment of the operation of Lake Eildon and Lake Eppalock to determine if changing the way the storages are operated could help mitigate flooding downstream and the potential costs and impact of such changes; funding for further business case development for levees – \$5 million over 2023–24; and addressing the public seeking increased access to flood studies by working to put flood studies into Digital Twin Victoria.

Finally, I would like to conclude with I have talked a lot about the learnings and lessons from the 2010–12 floods, how we have acted on these and the effectiveness of the *Victorian Floodplain Management Strategy*. Every flood is different, and that goes for the October 2022 flood event. There are learnings we need to take from every event to support the long-term preparedness of our Victorian communities, and this work continues to remain a priority for the department. Thank you, Chair. This concludes my opening remarks.

The CHAIR: Thanks very much for those opening remarks. I will start off with some questions. Those opening remarks actually went to perhaps some of the questions I had. Clearly there is a lot of work going on in this space. Factoring in climate change now, perhaps you could compare how you might be approaching some of the responses that are needed now. Obviously we are learning that we may have less water as we approach 2030 but we might have more severe rain dumps and more severe climate-related events. How are you and the department as catchment managers looking at and factoring in climate change in how you approach managing our waterways and systems?

Andrew FENNESSY: Thank you, Chair. The key way that we really look at climate change within the flood management area is how it is actually built into the flood studies in the first instance. The work that is being done in the flood studies just does not map a single scenario. Quite often you will hear about a one-in-100 event and that things are being designed for a one-in-100. The flood studies do actually undertake a range of scenarios, so that might be anywhere from the one-in-100 right out to what is referred to as the maximum extent. That allows then for the discussions to be had with local government, who might be looking to address the risk in that particular area – what level they actually want to be looking at in respect to the risks that they want to manage within that particular area. So fundamental to looking at climate change and how things might differ is to make sure that you are looking across a different range of scenarios in the first instance, Mike, is there anything you would like to add to that?

Michael JENSZ: Yes, thanks, Andrew. Another way we really look at it – we acknowledge that the research into climate change and the effects of climate is really important going forward. The *Victorian Floodplain Management Strategy* does kind of outline the need for continued research and looking at those elements. I think the other point you made in terms of the wet and the dry, in terms of scenario planning for dry conditions, we do actually factor in various ranges of climate scenarios as well in terms of water availability through our sustainable water strategies as we go through. So we factor climate change in in multiple ways, both in floods and in kind of water security as well.

The CHAIR: Thanks. Just following on from that, and it is a bit of a big question, one of the things we saw, for example, with regard to Maribyrnong was that it seemed to be that the middle catchment, because the ground was so saturated – we had so much rain – the run-off was in part a contributor to how much water came. So I am wondering how the catchments currently that you manage and that you are sort of looking at, whether those things are factored into modelling as perhaps something that might occur less frequently, depending on rain events. Again, this is climate related. Perhaps the second part of the question is: are newer technologies being explored, and how can they help in a real-time sense to get more information to people more quickly?

Andrew FENNESSY: Thanks for that. I will take the first part. I have got to say, in the first instance you are talking there about saturation within catchments and what that might actually look like and how that is taken into account, and that is really important here. An important thing we often hear talked about within flood management is around gauges and gauges providing the warning. The gauges themselves do not actually provide the warnings – the gauges provide information that goes into an assessment if issuing a warning. I am not an expert in this space; I have got to say that up-front. I am not a hydrologist and I do not do the flood modelling around there. It is the likes of BOM, and in the case of Maribyrnong any flood analysis undertaken takes into consideration what is being observed within the gauges. What are the conditions being observed? What did they know about the sort of saturation within the catchment itself? That is actually tracked and that is monitored along the way, so we are able to talk about what that might look like in different parts of the state, and then also rainfall. So all of the information is pulled together, which culminates in a warning actually being issued. So there are many sort of different facets to it.

If I recall correctly, another part to your question, Chair, was around are there things that can change or technologies that can change to address this and help make it better? There are always moving technologies in regard to how we can improve flood mapping or flood information, so we keep an eye on that. Moreso our agencies who are doing this flood work are looking at what is sort of best practice. I did note coming out of the Pagone report as well that one of the recommendations and one of the issues appears to be how quickly can you turn around information. If something changes within the landscape, what are those parameters that get fed into that analysis? In this case it might have been where a gauge was situated or more rainfall actually occurring. How quickly can you turn that around? That is something I know that Melbourne Water has noted – how they can turn that around. It is also something that will be looked at by other agencies who do that work as well with the BOM. So that is something coming out of this that will have to be looked at to see what improvements can be made in that particular space.

The CHAIR: Yes, so things in a real-time way – how quickly people can get that. Well, that does me with my questions, so thanks very much for that. Now I will hand over to Mr Ettershank for a question, please.

David ETTERS HANK: Thank you, Chair. Thank you very much for joining us today. It has really been appreciated, and a very thoughtful contribution. The committee has heard very different views of the Maribyrnong incident. There has been such a diversity I suppose you could almost wonder if people are talking about the same event. I guess from my personal perspective there would appear to have been some significant fails in terms of both the flood prediction and the extent of flooding, and the extent of that which was reflected in the warnings that were or were not provided in a timely manner. So I guess perhaps just to start with a fairly broad question, I am interested in the department's hindsight perspective of what actually happened and why we ended up with the shocking mess that we did in Maribyrnong.

Andrew FENNESSY: Thank you, Deputy Chair. I think once again I need to state up-front that I am not a modeller or an expert in that particular space. I know that there have been diverging views, and I certainly know that this has caused a lot of angst for the community around Maribyrnong and really wanting to get to the bottom of this answer. What I look to here is that I do know that Melbourne Water have actually presented on their version of events, and I know that that has certainly been communicated by other members and other

people there. I do look towards the Pagone review that has been taking place and independently run there with the advice that they have been able to pull together, and they have got different skill sets on that panel. I do refer to Mr Pagone, but there were other members on that panel who had significant expertise in modelling. So what I would be drawing on is looking at what is coming out of that report. I do recognise that there is still further work to go. I know that there is still further work for sections of the Maribyrnong that will not be ready until probably March–April next year that is going to give us a clearer understanding of what actually happened in that particular space.

David ETTERS HANK: I take up what you say about the flood modelling. I think we are all a bit chafing to know what is going to come out of that, but that is what it is. Does your purview though actually contemplate what happened on the ground on 13 and 14 October and immediately after? Is that within your scope?

Andrew FENNESSY: No, it does not sit within our scope. That is an operational approach. A lot of the work that we do and are happy to talk through from the department's point of view goes into the preparedness components. It does go into the work that we look at with the flood studies, looking to fund flood studies and investment there into other mitigation measures and really the establishment of the flood strategy in the first instance and some of the policy measures, but once it actually gets into an event we do not have an operational function per se within that, like what Melbourne Water are doing in issuing the warnings or how they are tracking that. That is up to separate incident control centres or the State Control Centre, that interface on the day-to-day operational issues. So that is left for the agencies, and in particular the state emergency services are leading that as well.

David ETTERS HANK: You made a point about gauges not providing a warning, just one input. I guess there have been some fairly specific propositions that were put here and also before Judge Pagone with regard to whether indeed that dependence on the Keilor gauge was in fact methodologically appropriate to inform the warning process, in particular obviously that thing which happened where people were told in the afternoon of the 13th that it was going down and then they were told at 3 am 'No, start swimming'. Did you have an involvement in that, or do you have some perceptions after the event as to the accuracy or otherwise?

Andrew FENNESSY: No, we were not involved in that. As that is happening in real time, that is, as I said, being managed within the incident control centres, in this case Melbourne Water, and ensuring that they are interfacing into the incident control team or the state control team more generally, so we are not privy to that as that is unfolding at that particular time. As you have seen and others heard as well, we had some of the post-event reviews that go on as to what actually happened in that particular case, and I know that there has been discussion there around things such as the rating curve, changes in rainfall and flows and needing to go back and do further analysis. That was really around the warning systems, but I am being careful there as well that I am not an expert in flood warning systems. I suppose coming back to your initial question, no, we are not involved in that from an operational basis.

David ETTERS HANK: You referred to the fact that you are maintaining the FloodZoom platform. How does that fit within this scenario, I guess again particularly focused on the Maribyrnong setting?

Andrew FENNESSY: I will ask Mike to talk a little bit about this in a moment. But one of the things within FloodZoom that really did come out of the earlier reviews and also the flood studies was recognising that there was no singular authoritative interpretive flood platform that we had, and the key thing is that when the flood studies in the early parts – and the flood studies that I am talking about here are not so much around the warnings, they are the flood studies that are undertaken in the first instance to understand how water might actually move in the environment and what the impacts are going to be. They are all actually stored within this platform known as FloodZoom, so it provides ready access, in the instance of the State Control Centre during an event, to be able to look at, if they are getting information that a flow might be of X extent, what that might translate to and what the impacts might look like. But I might just pass it over to Mike, who has got a bit better understanding, or more knowledge I suppose, in respect of FloodZoom itself.

Michael JENSZ: Thanks, Andrew. My team manages the FloodZoom tool, and effectively it is a tool used for incident controllers and hydrographers to look at the flood studies and map out the risks of what could possibly happen under some different kinds of scenarios and events. That data enables incident controllers to understand depths of water across roads et cetera. It is one tool that is used. Hydrographers – we have different ratings as well, and the SES has different ratings about who provides information back to the ICC. So they will

use FloodZoom as a tool to map out some of those things, but they will use some other tools as well in terms of some other GIS layers et cetera to complement that information. In the case of something in the regions, you will use that as your first tool, and I am sure a few people in the CMAs who you are seeing this afternoon can talk to you a little bit more about how they undertake that information. But it really enables us to look at gauges in real time against those flood studies to see what actually is occurring. In the case of Melbourne, they have their own systems as well to map out those risks in terms of their flood studies, so they have access to a different tool to actually interpret their data as well.

David ETTERS HANK: Can I follow that up? One of the things we have heard, and I think it is referred to in Judge Pagone's work, is the delay that occurred on the evening of the 13th. They were talking about 2 to 3 hours for that data to be analysed. Is that a Flood Watch delay or is that a delay that is on the basis of the systems that are being used by Melbourne Water, or both?

Michael JENSZ: It is a good question. There are effectively two systems or two models that are being undertaken. One is around the risk element in terms of what is the effect of an event that is coming through and a warning system – the models predict the warnings. I cannot talk to the specific nature of the flood warning system, how that was used and the timeliness of that. That is really a question for Melbourne Water in terms of how that system works. What I can say is the FloodZoom platform itself then allows you to, once you understand the predicted levels, understand where that maps going forward as well. So there are two tools or two models that are being used at the same time.

Andrew FENNESSY: We are happy to take you through that particular FloodZoom platform as well if that is of any interest.

David ETTERS HANK: That would be great. I guess I would be really interested, perhaps by way of supplementary information, if you could provide us with a bit of an understanding of that time frame. In Judge Pagone's report there are some tables that actually go through the critical time frames. I guess I would be very interested to, perhaps by way of supplementary information, hear from you about how what you are doing fitted with those time delays. Of course also I think there was an issue there with Judge Pagone's scope, so he had limited ability to look into certain relevant questions that strike to this. If I am understanding the Flood Watch question, is your role more of a publisher, if I can put it that way, of data, rather than an interpreter? Would that be a reasonable characterisation.

Michael JENSZ: We are not actually the publisher either. Think of the FloodZoom tool as a repository of all the flood studies that we have across the state, and then that maps in real-time data as well to allow a flood expert to provide advice to the incident controller around the effects of the event that you are seeing at the time. At that point that allows them to actually make decisions on the ground, real-time decisions, about how to mitigate effects, provide warnings et cetera during the event, versus I think what you are talking about is Flood Watch, which is effectively the prediction of 'Is it going to rain? How much will it rain?' et cetera. In the case of Melbourne, at the moment it is being run by Melbourne Water, who provides those predictions, and then SES publishes those warnings. In the case of the remainder, across the regions, the Bureau of Meteorology provides that information.

David ETTERS HANK: Thank you. I am running against the clock here a little bit, so I will have one more punt. Mr Fennessy, you referred to working through the learnings I think of multiple incidents, but particularly I am interested in the Maribyrnong one, and you are in the process of analysing that. Could you give the committee a bit of an overview of what you have discovered so far or where that investigation is heading?

Andrew FENNESSY: I can tell you where we are heading at the moment. We have looked into what is within our scope or our work program. Between January and June we undertook our own after-action reviews, and that is across wideranging things that are within our remit, and that might touch on things such as levees, which I am sure we will talk about today. But there are other issues there – you know, from our interface how do we even resource up ourselves? Because we do provide some backup services into the State Control Centre just because people have those skill sets. We undertook those reviews. Overall, we met with other parties such as local government, SES, water corporations, CMAs and those types of agencies, and a number of others – VicPol. I think there were about 150 different attendees. We are due to have that report finished in the next month or two, probably more so into December, and we are happy to make that available to the panel as well.

Mike, did you want to add anything to that as well?

Michael JENSZ: I think the only thing I would add is there are about 13 themes that we looked through in terms of taking those, and as Andrew pointed out, people involved, including councils, SES, VicPol, our water corporations, both our bulk and urbans, were involved in those reviews.

The CHAIR: I am sorry, Mr Ettershank and panel, your time has expired. I will now go to Ms Lovell with a question, please.

Wendy LOVELL: Thank you very much, Chair. Thanks for your presentation today. You mentioned in your presentation that the department has a role in flood mitigation but also that the CMAs and the water authorities have responsibility there as well. Can you please outline what responsibilities fall into each level so that we understand fully who is responsible for what.

Andrew FENNESSY: Yes. I will try to do this in the simplest way as I can possibly and hopefully not go too far up a path. If I almost took it from a point of view of if you are looking at coming into a new area, just say a new township that does not have any flood studies or anything done at this particular point in time, then what would happen is that a flood study would be done in the first instance to understand what the risks and impacts are within that particular area. That predominantly is led by local government, because it is local government looking to understand the risks that it actually has within its local community. It also has other responsibilities there obviously around planning and those types of things. Within the development of the flood studies, in this particular case as well it would be local government looking under its municipal emergency management plan and saying given that we know what those impacts are, what are the actions that we need to take to look to mitigate those particular risks? That is where it starts to draw out there as to what the mitigation measures are which might actually take place. That is not done just within local government itself. There are discussions there with the SES and in most cases there is a broader discussion here on the development of the flood studies and also on the development of those plans with community about what other mitigation measures might be required.

I should have said as well, the development of flood studies is supported also by the catchment management authorities to provide that support and expertise into local government. It has been identified that not all local governments actually have that. Once those mitigation measures are actually identified, we can then look to say – and this is where the department comes more into it – what are those benefits actually providing and who actually should then pay for those particular mitigation measures? And through the department we can look to facilitate funding for those particular mitigation measures if there is funding available. We do have what is known as our risk and resilience grants fund, which we make contributions into. But what starts to come is that mitigations are all accumulated up, and they can make a submission into the risk and resilience grants, or other grants that might be available, to secure funds. What happens in most instances for the mitigation measures is if there are wider benefits across the community it would normally be the case that the state funds a third, the Commonwealth funds a third and a third of that is funded locally. That is trying to give a very quick snapshot there of –

Wendy LOVELL: What was the name of that fund?

Andrew FENNESSY: Risk and resilience fund.

Wendy LOVELL: Right. But what is the role of the CMAs and the water authorities?

Andrew FENNESSY: Predominantly within this space here, looking even within the mitigation measures as you talked about, the main role within the catchment management authorities here in the first instance would be that support and assistance being provided into the development of the flood study and then also when it comes back and the local government is coming back and saying, ‘Well, this might be the mitigation measure that we look to put in place,’ then they will do that collaboratively also with the catchment management authorities – you know, will that have any other sort of impacts or will that give effect to what they are actually looking to do? If we look at the case, for example, of a levee being put in place in a town, local government come forward and the community come forward and say they would like to put a levee in place. Then they would also be speaking to the catchment management authority there to say, ‘If we’re building this levee, what do we think the actual impact is?’ Because once the water is diverted from one place, it is going to go

somewhere else. It is a bit of an iterative approach that happens with the different agencies, in this case catchment management authorities, in the development of that. Mike?

Michael JENSZ: I think you might have also asked about the responsibility of the water corporation in terms of flood mitigation as well.

Wendy LOVELL: Yes.

Michael JENSZ: On the water corps, there is only one instance that a water corp has got a levee – in Loch Garry. They have got a water management scheme there that they manage. That is the only instance in that case. In terms of their obligations under bulk entitlements in the Act et cetera, their obligations to manage storages are clearly articulated in terms of their responsibilities to provide secure supply of water and then where possible the attenuation of that dam for flood mitigation purposes.

Wendy LOVELL: Sorry, what was that about –

Michael JENSZ: The attenuation. It is to make sure that how the flow comes out of the dam is in a way that minimises impact where possible.

Wendy LOVELL: Right. So late releases and big releases would not be fitting with their responsibilities under mitigation responsibilities?

Michael JENSZ: Probably it is best for Jesse to talk about the storage operators and their obligations under the Act. So I might pass over to Jesse, who can tell you a little bit more about how that works.

Jesse ROSE: Yes. Thanks, Mike. The water corporations are appointed as storage managers under the Victorian *Water Act*, and they operate those storages in line with the primary purpose of the storages, which is to provide a safe and secure water supply for towns, irrigators and the environment. Within that primary function some of the storages are operated to provide some downstream flood mitigation where possible. For example, Lake Eildon in the Goulburn catchment is operated to target fill points within the filling season that enable some flood mitigation benefit to be provided when there is sufficient certainty that future inflows will come that will replenish what is released. Some flood mitigation benefit is provided where possible, but that is always within the context of the primary function of that storage, being to provide a safe and secure water supply.

Wendy LOVELL: The issue we had with Lake Eildon at over 100 per cent in July, or June even – how was that responsible flood mitigation management? We were going into winter.

Jesse ROSE: I think Lake Eildon was filled recently. Lake Eppalock was –

Wendy LOVELL: Lake Eppalock was full – over 100 per cent in June as well.

Jesse ROSE: Having Lake Eppalock full when storage inflows generate that is consistent with the storage management obligations that the water corporation have and the primary function of Lake Eppalock, which is to provide a safe and secure water supply for towns, irrigators and the environment. Towns like Bendigo and irrigators downstream rely on that water. That is the primary function of that storage, not to create a flood mitigation benefit. Despite that, we know that Lake Eppalock does provide some attenuation of flows as it passes through the storage so that the peak of the outflows – and this was particularly the case in October last year – coming out of Lake Eppalock were significantly less than the inflows coming in. So whilst it may not be operated to create airspace to capture additional flows, it does attenuate the peak.

Wendy LOVELL: You said that at Eildon there are filling levels to provide mitigation, but that same scenario does not apply to Eppalock?

Jesse ROSE: Yes, that is right.

Wendy LOVELL: But having Eildon at 100 per cent in June this year must have been well beyond their filling obligations and a failing in their flood mitigation responsibilities for that storage.

Jesse ROSE: Look, I would need to check the figures. I do not believe that Eildon was at 100 per cent in June.

Wendy LOVELL: It was 99 or 97 per cent. It certainly was in July.

Jesse ROSE: As a result of the recent rainfall event it filled –

Wendy LOVELL: No, it has been full for a long time.

Jesse ROSE: Lake Eildon is operated to a target filling curve. Throughout the filling season Goulburn–Murray Water identify what that number should be, so they take into account how full the storage is, climate conditions, historic inflows and what can be expected over the coming period, and then they generate a set of target filling points throughout the months leading up until the end of the filling season, which is either 1 October or 1 November. When the storage sits above that target filling point – let us say, for example, they were targeting the storage to be at 94 per cent on 1 August, if the storage sits above that, they will make releases to bring it down to that 94 per cent as at 1 August. As inflows come in that greatly exceed what we would want or what GMW would be able to release downstream without creating flooding downstream, they manage those inflows and release it. So there will be periods throughout the year where Eildon sits higher than what that target filling point is because it has attenuated those inflows and provided that flood mitigation benefit, and then they will actively reduce the storage. So they are not always sitting at the target filling point; often it will go above that because of the inflows that come in, and then they actively make those releases to bring it back down.

Wendy LOVELL: Okay, thanks. You talked about levees, and you said that you put \$2.7 million into assessing the levees and money into business cases for levees et cetera. Can you tell us about the ownership of levees, who is responsible for levees and if there is any statewide or catchment-wide coordination of repair of levees? We continually hear that nobody owns the levees. You know, a big proportion of them are built in state forests and regional forests, so they are on Crown land, they are not on private land. But then again, the ones that are on private land, they are saying private owners are responsible for them. Well, if Melina and David repair theirs and I repair mine and Sam repairs hers but Ryan does not, we are in a bit of trouble, because it is just coming through his breach into our places. So what coordination goes on for that repair of the levees, but also who is responsible for those levees on Crown land particularly?

Andrew FENNESSY: You are right, and I will get Mike to talk particularly around the levee one, but there is about 4,000 kilometres of levees across the state, and they are in all types of status of the quality of those particular levees. A lot of those have been pushed up over the last hundred years in all sorts of different states of repair and all different states of whether they can be relied on into the future. A big thing coming out of the *Victorian Floodplain Management Strategy* was providing clear roles and responsibilities and accountabilities around levees. I do know that this is certainly one of the ones that is probably somewhat more contentious and exercises a lot of people's time within the regions, but we do feel it is very clear within the flood plain strategy and the framework and the process for identifying ownership of those particular levees going forward and how they are coordinated. Mike, do you want to –

Michael JENSZ: Yes, thanks, Andrew. Particularly coming out of the Comrie review and the ENRC review in 2012, the issues around levee ownership and maintenance and long-term protection was considered, and their recommendations were really to make sure there was a clear process not only to manage levees but to have clear ownership as well. As part of that and as part of the *Victorian Floodplain Management Strategy*, it was determined the most appropriate agencies to look after the long-term assets would be local councils, because they already have town levees et cetera, going forward. There would be a process of them, through flood studies, identifying risks to communities and then what mitigation actions they would have to protect those areas, such as levees or flood warning systems et cetera. In doing that, we have been providing obviously funding for the flood studies to identify those risks. Through regional flood plain management strategies, CMAs have helped coordinate with councils and SES et cetera to look at issues around levees, in particular rural levees, as well as around whether or not councils would be willing to take on the formal ownership and management of those levees.

Wendy LOVELL: Good luck with that.

The CHAIR: I am sorry, everyone, but, Ms Lovell, your time has expired, so we will go to Mr Batchelor with a question now, please.

Ryan BATCHELOR: Thanks very much. Thanks, Chair. Thanks, everyone, for coming in. One of the things I am interested in is the differences that we need to be thinking about as a committee between the approach to flood mitigation and catchment management in urban rather than in regional settings, and particularly those with coastal issues. I am particularly interested obviously in what happens in Elwood with the outflows from the Elster Creek and the interactions with surges from the bay. We have had flooding in Elwood in the past. It was not as badly affected in 2022, for a range of reasons. I am just wondering if you can provide some evidence to the committee about what we need to be thinking about in those sorts of environments versus some of the regional ones.

Andrew FENNESSY: I think the methodology remains the same. It depends whether it is in an urban environment or whether it is actually in a regional and rural environment. Fundamentally here we need to go back, understanding what the risks are that are within any of those particular environments, regardless of where they are. Once again, I come back to understanding that information through flood studies. Flood studies would be able to identify what the risks are, and then you can look at what the appropriate mitigation measures are. I think probably what the difference is here, in my view, re between urban environments and probably more regional environments is people's awareness around flooding and how much they might also buy into the discussions and look at information around flood events – what the risks might actually be and what the mitigation measures might actually be. One of the things that we are looking at, certainly coming out of last year's event, is how we look to communicate not just across the regional and rural areas but working with all of our partners there, whether that be SES, local government or CMAs and the like, as to how we can communicate more broadly the roles and responsibilities and information relating to flooding. I think that is pertinent in urban areas as well.

Ryan BATCHELOR: You talked about awareness raising with flooding risk. Who do you think has responsibility to be part of that awareness raising?

Andrew FENNESSY: The SES take the lead there in communicating to communities around those sorts of risks, particularly leading up to it and during an event itself. But communicating as well during the lead-up to that is in the preparation of information. Mike, did you want to –

Ryan BATCHELOR: Sorry, that strikes me as a kind of emergency response. Preparation is the key often to resilience building in communities. Who do you think needs to be part of that and lead that?

Michael JENSZ: In this case, particularly providing information out to communities around the flood risk et cetera, it is an all-agencies approach in doing so. There are multiple ways that is done. SES do it through their flood plans, and they provide that in community plans et cetera going through.

Ryan BATCHELOR: What sort of flood plans do you think work well?

Michael JENSZ: It depends on the community as well, particularly coming out of the flood studies and working with communities about how best to communicate that information. For instance, in Rochester I think SES might have talked about how they have got a series of floor levels et cetera, and they can provide pamphlets to the community about their flood risk in terms of if a flood comes through. So that is one way. But there have got to be multiple tools here, because a pamphlet or information in one sense will work for someone, for instance. In other instances people prefer to look online and look at tools such as Flood Eye, which is a North Central CMA tool, or Goulburn Broken has got another tool which looks at flood risk – you can put in your address et cetera. One of the things we are doing is trying to incorporate that statewide so we can actually have a statewide system through Digital Twin Victoria where you can access flood data. Our plan is for it to go live by the end of the year, subject to load testing et cetera – so another way to communicate that information.

But we cannot stop there. We have to continue to go back to the community and ourselves and work out how we simplify that information out. I have heard that there have been a lot of discussions about making sure it is in a whole lot of different languages as well. In terms of accessibility of information, that is really important as well. That is something that we are actively looking at collectively, and we will continue to do so.

Ryan BATCHELOR: One of the things that came up in the discussion around what happened in Maribyrnong, particularly in relation to the development on the Rivervue site – and it has been a little murky about who did what, when, and that is what we are trying to get into – one of the things that clearly happened was there was some kind of reassessment by Melbourne Water about flood tables or something. Technical issues are not lodging in my head; they have tangled each other, lodging in my head. But clearly something changed or there was a reassessment done, and the flooding overlays, the LSIO, changed. The flooding intelligence information and the data that you work on and prepare, could any of that have played a role in triggering that process to occur?

Michael JENSZ: I can answer that. No. If you think about the information that we prepare and communicate, it is really about providing that funding out to local governments to prepare flood studies, and Melbourne Water prepare their own flood studies as well. We have requirements in terms of new flood studies through the *Victorian Floodplain Management Study*, requirements for peer reviewing et cetera of new studies, and there are studies that have developed over time as well. But we do not have a direct role. It does not inform our work. It is kind of a combination of that information that we provide out.

Ryan BATCHELOR: What would trigger a new flood study or a reassessment of existing flooding tables, in general terms?

Michael JENSZ: For flood studies, it will be really varied and it will be depending on the risk in terms of what is happening. It will depend on if there is a new event that has occurred; that will allow you to plug in some more information to understand that risk. It could be the time between, depending on the timing and not necessarily. It just depends if there are big changes in the landscape. New technology: as new technology comes through and there are different models produced, that might be a reason to update as well. So it will really vary depending on the area, the site, the conditions it has had et cetera.

Ryan BATCHELOR: Would development play a role in that – like a change in the physical landscape, a change in land use?

Michael JENSZ: Yes, that would have elements going forward as well.

Andrew FENNESSY: If it is a material change in landscape, one of the things even within that same sort of area we would look at Fishermans Bend or Arden and those types of ones as well. Within a precinct there as well is that we do know that has generated its own sort of flood study in those particular areas, and that is something that is obviously a significant change within the landscape.

Ryan BATCHELOR: So that is the planning process, the structure planning, the sort of vision for what an area could change from to – that might be sufficient to trigger a reassessment of flood studies and the like?

Andrew FENNESSY: Yes. If there is a material change in that sort of built environment there – so it might have a material impact on how water flows within the landscape.

Ryan BATCHELOR: And in those big new urban renewal developments you would expect those flood studies to be done as part of that development and planning process?

Andrew FENNESSY: They have already been done in a great number of those cases, yes.

Ryan BATCHELOR: Great. The only other thing I was just going to ask – you obviously have developed these guidelines for development in flood-affected areas from 2019. I am just wondering if you have got any reflections on those guidelines – how well you think they are being considered by relevant planning authorities and the like.

Andrew FENNESSY: It is hard to actually say. What we have actually done with those development on flood plain guidelines is really pull together a compilation of requirements that come from different areas, whether that be planning requirements, whether that be building requirements, and in the context of what is being considered in different facets of what needs to be looked at for building on those areas. It is nothing that is really new that we are creating within those guidelines themselves. It is actually assisting agencies who are doing work in this particular space to go to a document that has information in one particular area. So going to the point of how they are being used across agencies, I certainly know that they are being used and I hear them

getting referred to. The effectiveness – is that being looked at widely, across everyone, I cannot answer that definitively.

Ryan BATCHELOR: They are not designed to have sort of an assurance or monitoring framework attached to them to see how agencies or relevant authorities are making decisions and taking into account the guidelines – that is not their purpose?

Michael JENSZ: I am happy to answer that. The guidelines were as a result of one of the recommendations under the Victorian flood plain management strategy to have a document that provided guidance to new flood plain managers et cetera about how to think through their responsibilities. They were actually coordinated and developed with catchment management authorities and Melbourne Water as we did them to capture that information so each statutory authority has their own. They have got the guidelines and they can look through them, but then they either adopt the guidelines or make changes depending on their own specific conditions and catchments.

Ryan BATCHELOR: So they are a sort of general sense of what should be done, but there might be some localised specific tailoring that needs to occur by the catchment management authority?

Michael JENSZ: Exactly, depending on their own catchment conditions and what they know.

Ryan BATCHELOR: Your assessment is that they have been generally well received and adhered to? Is that the evidence you are giving?

Michael JENSZ: In my conversations back with flood plain managers et cetera, yes, they are generally used as a reference guide and each CMA and Melbourne Water has their own kind of adoption of those going forward as well.

Ryan BATCHELOR: Just to clarify, they are for CMAs solely or are they also for local councils or planning decision-makers?

Michael JENSZ: Effectively it is because they are the roles and responsibilities around the flood plain management, which sits with the CMAs in terms of their referral authority. It is through them, but other people can use them – councils, developers can use them as well to get a sense about what needs to be considered in terms of development in flood plains et cetera.

Ryan BATCHELOR: Okay. All right. I might leave it there, thanks, Chair.

The CHAIR: Thanks very much, Mr Batchelor, and perfect timing. Dead on the clock. Dr Ratnam with a question, please.

Samantha RATNAM: Thank you, Chair. Thanks, everyone, for your submissions today. A couple of specific questions first. The Victorian Farmers Federation and the New South Wales government's inquiry into their 2022 floods have both called for real-time river gauge data to be available online. In the case of VFF, it is so farmers can make their own decisions about moving stock when warnings are mostly focused on towns. DEECA currently runs the FloodZoom, which you have talked about, which includes real-time streamflow data but is not designed for or accessible to the public. Have you considered making gauge data available to the public through FloodZoom or another platform?

Andrew FENNESSY: I will take that in two parts; there is the FloodZoom part and there is the gauges part. I mentioned earlier that the department manages the water monitoring network, which essentially is running the contract for all gauges across the state. So if gauges are held by whether it be BOM, local government or other parties, then we look after that contract. It just makes it easier. It is a single contract. It is a maintenance contract. It just means all those different agencies do not actually need to do that, so it is held in one spot. There are about 54 partners in that and there are about 950 sites. That information is actually available, so on any one of those particular sites for those gauges people can actually go in through the department's website and actually click on those sites. I have got to say, though, that that is not designed for emergency management purposes. It is there for people. If they want to look at a particular gauge for whatever particular reason, they can do that. We always still stress that any of the information that is being provided around emergency services should still go back through the official sites such as BOM. BOM do have those same gauges – it is all part of

the same network – up on their site as well, so they do provide information there for river flows. Not all of them have telemetry and not all of them actually have the real-time monitoring. About 65 per cent of our gauges actually have that monitoring.

Samantha RATNAM: You are basically saying that information is available in some places if people want that specific information, but you would prefer them to go through the ordinary emergency warning channels for consistency. Is that fair?

Andrew FENNESSY: That is correct.

Samantha RATNAM: Is that information absolutely consistent then? Could they get better information by coming through some of the platforms that you all have available? That is a question I have got.

Andrew FENNESSY: It is actually the same information, and what we are really mindful about here as well is looking at single points of truth, and that is why we do so. I am telling you that because we are letting you know that information is available out there, but during an event itself they should be going back and looking at official sites. I also do say as well that locals will know. They will know if they look at a particular gauge in a particular area what it is actually going to do. Some of the questions might come back to, though: are they in the right areas, some of these? That might be the question as well.

Samantha RATNAM: The gauges – it is a different question, isn't it? So in some ways you are saying it is not necessary. Although you all have that available on FloodZoom, you are saying it is available and it is being made available to the right authorities, so you would not see it as necessary to make your platforms available. Is that what you are saying – it is duplication?

Andrew FENNESSY: Jumping onto the second part of your question there around FloodZoom, at the moment it is an internal platform, and it is used – as Mike has been talking about – internally via our catchment management authorities and via incident control centres during an event. It is what we are looking at. When Mike talks about Digital Twin Victoria making more information available, that essentially will then become the forward-facing or the public-facing component of FloodZoom. Mike, did you want to talk about that?

Michael JENSZ: I think that will really be for planning purposes as well. So before an event if you wanted to understand your flood risk, that is not just in the planning scheme, which may be a one in 100, as we talk about. You might want to understand your risk at lower events or larger events. You will be able to have access. We sort of have access now. You can go out to a CMA and you can ask about a property, and they will provide that free of charge. In Melbourne Water I think there is a portal you can ask and you can get advice around certain flood areas. What we are trying to do is streamline that and make that available before an event for everyone so you can prepare going forward. We are very, very mindful –

The CHAIR: I am sorry, everyone, but the clock has beaten us, so we will have to move to a question from Ms Bath, please.

Samantha RATNAM: I got one question.

Melina BATH: How long is our time, Chair?

The CHAIR: That was 15 minutes.

Samantha RATNAM: No, that was not 15 minutes.

Wendy LOVELL: No, that was not 15 minutes.

David ETTERS HANK: No, it was not 15 minutes.

Samantha RATNAM: I asked one question, Sonja.

The CHAIR: Sam, it is not about asking one question. I have just got the clock, so unless my clock has malfunctioned – you are saying you had 7 minutes, did you?

Samantha RATNAM: I was not timing it but –

The CHAIR: Okay. Well, my clock said 15 minutes, but I will give you another 5 if you like.

Samantha RATNAM: Sure.

The CHAIR: I am just trying to be fair with everybody. So continue, please.

Michael JENSZ: I am happy to take it on notice too in terms of how that plays out going forward as well, to give you that extra information.

Samantha RATNAM: Great. Thank you very much. Mitchell shire, Murrindindi shire and the VFF have called for more gauges, and the VFF says the number of gauges has decreased over the years and they are not always maintained. Does DEECA agree with this? Do you think that the number of gauges needs to be increased?

Andrew FENNESSY: I will take that along a couple of lines. The question there or comment there about being maintained – we do have a service contract for these, as I said, across the whole state, and the gauges are regularly maintained and through our service contractor they do need to meet a certain standard. In fact I believe that most sites or all sites are actually visited probably on about a monthly basis. In regard to them being maintained, we do know that during the event some of them actually failed, and that was mainly due to inundation.

In respect to ‘Are there more gauges actually needed?’ it goes really back to the example I was providing before around mitigation measures. Within those shires – within Mitchell and Murrindindi – there is the ability there that if they believe that there is a gap within their flood warning network or the service that is actually being provided, they can work back through the CMA to see whether there is any additional service that can be provided. So what would happen in that case is that they do not need to know exactly where the gauges are; they just say, ‘This is the type of service or warning service that we want in this particular area.’ And through the contract that we have with the Bureau of Meteorology they can then do that assessment to say, okay, if you were wanting a service and say you wanted 12 hours notice or something when it gets to this particular level, this is where the gauges would actually need to be located if it was at all possible to provide an improved level of service. So there is the ability there to increase the amount of gauges if that is what is actually required by the community and by the local government within that area.

As I might have mentioned before, if it is identified that an increased service can be provided through more gauges in that area and the local government say, ‘Well, that’s exactly what we want; we want to take them on board’, the local government does not pay for the gauges up-front. Through the risk and resilience program if an application goes in, we can look to fund those if the funding is available through both the state and Commonwealth. What we look at with local government is just to pay for the ongoing maintenance, the cost of that.

Samantha RATNAM: So there is a mechanism. Basically you are saying there is a mechanism to increase the number of gauges, but – okay.

Andrew FENNESSY: Yes. 100 per cent. And we have recently responded back to Murrindindi shire.

Samantha RATNAM: Great. Connected to Murrindindi shire, my next question was: Murrindindi actually said that there was no funding available to restore trails or wetlands, because these are not essential infrastructure apparently. Is DEECA doing any of this type of restoration work, or are you considering it?

Andrew FENNESSY: I might take this one on notice –

Samantha RATNAM: That is fine.

Andrew FENNESSY: just in the case that – there have been some changes in how that is actually looked at for the funding, and I do not have a really specific answer to give you but I will take that on notice.

Samantha RATNAM: That would be great. Thank you. I have one further question on some of the evidence you provided previously about the kind of planning work and the flood study work you are doing. We have heard from a number of councils who are calling for more statewide support and coordination of flood plain overlays, because they are doing the studies, they have got to start the planning scheme amendment

process, that can take years, the next flooding event happens, climate change et cetera. With the flood studies you all are doing – is there an interaction between all those flood studies you are doing and the ones the local councils are doing? Are they the same flood studies? What is the interaction there?

Andrew FENNESSY: They are the same studies.

Samantha RATNAM: The same ones. Okay.

Andrew FENNESSY: Yes. The work that is really done around those flood studies – the local government actually does lead them, but we provide that support. When I say ‘we’, more generally within the water sector it is provided by the catchment management authorities, because they have got the skills and expertise to assist within that, so they get to do that work. Mike, is there anything you would like to add?

Michael JENSZ: No, no. That is all right.

Samantha RATNAM: So there is a mechanism to kind of pool those flood studies. The question now is what we do with them as a statewide kind of overarching approach as opposed to local councils, perhaps. Do you have a view on that? Do you think there should be more statewide coordination of those flood plain overlay planning scheme processes?

Michael JENSZ: One of the outputs of a flood study is a layer for the planning scheme amendments. We are always supportive of ways to expedite those into planning schemes. So we are always looking for opportunities. I would say that, you know, as soon as we finish a flood study though, that goes straight into FloodZoom and we use that for emergency response, so that information is being used as soon as it is available, because of that risk management, as we talked about before.

Samantha RATNAM: One final question, which you might have to take on notice because I have run out of time: with that data that you have on FloodZoom, based on all the flood studies et cetera, we have heard throughout the course of this inquiry that something went wrong, right? A lot of communities said they were not warned in time. We have had varying, often contradictory, evidence about whether the modelling was right or the emergency warnings were just delayed. Was the information you had in FloodZoom consistent with the modelling that was communicated to the public? Was everything you saw from your end consistent with what we saw in the flooding event? We are trying to get to the source of who has got the best data here and how we improve that data getting to the community. Do you have a view on that?

Andrew FENNESSY: Did you want to answer?

Michael JENSZ: If I can. The data that comes into FloodZoom is the data that is actually developed by councils –

Samantha RATNAM: It is the same.

Michael JENSZ: It is the same data. It is kind of like a repository of the information that goes through, so there would not be a difference.

Samantha RATNAM: So the issue is not about that data being inconsistent. It is something else that is happening. Okay, great.

Michael JENSZ: There are two types of modelling: there is the one for the actual warning itself, and there is the data when we are looking at the impacts.

Samantha RATNAM: Looking at impacts. Okay, great. Thank you. Chair, I am done with my questions.

The CHAIR: Great, thank you very much. Ms Bath with a question, please.

Melina BATH: Thank you, Chair. Thank you, gentlemen, for being here today. You mentioned after-action reviews, and you mentioned that there were local governments, CMAs and VicPol. Could you please provide to the committee, because we need to understand, what dates they were on, who was invited to attend, who attended and any minutes from those meetings, with actions? That is my first request. Are you able to do that?

Andrew FENNESSY: Yes, we are able to do that. We will provide that.

Melina BATH: Thank you very much.

Michael JENSZ: One thing on that, just with an after-action review, we can tell you the organisations, but we do not provide the specific people, because it allows them to speak freely.

Melina BATH: That is what we are interested in, for certain, on behalf of the community. Campaspe, Gannawarra, Loddon, Buloke, Pyrenees and Mitchell shires have stated to us that they have not had any multi-agency debrief or after-action review, so I am interested in understanding whether they were on your list of meetings, because the information we have been getting is that they have not had a review.

Andrew FENNESSY: Did you want me to answer that now or take that one on notice? I do know some of the ones that you have mentioned there have been invited along, and I do know some have actually attended the after-action reviews.

Michael JENSZ: I think there are two parts here as well. One is: we have taken our after-action reviews in terms of our responsibilities to the water sector and our support responsibilities, so we have had those reviews. But obviously the broader reviews are done by emergency management et cetera – they might be referring to their own. I am unsure, but I can tell you that in terms of our specific after-action reviews that we do to track our responsibilities et cetera we have invited those people along.

Melina BATH: And you will provide a list for us.

Michael JENSZ: And provide a list –

Andrew FENNESSY: Of some of those who attended, yes.

Melina BATH: Thank you very much. Certainly that would be most helpful. I will go to Loch Garry. Mrs Broad and I actually visited Loch Garry, and we know that it is very old and it has had very little modernisation in the last 100 years it would seem. Does the department believe there should be changes made to the operation of Loch Garry?

Andrew FENNESSY: You will be probably familiar that there was a committee set up post the event as well last year, which did look at the operational rules associated with that. They have come back and made their recommendations, and those changes have been taken in by Goulburn–Murray Water for how Loch Garry is actually operated. I take it you are referring to any other future changes or arrangements for Loch Garry?

Melina BATH: For its modernisation.

Andrew FENNESSY: For modernisation – Mike, do you want to talk about the second part?

Michael JENSZ: Yes, I certainly can. As part of that work, and Goulburn–Murray Water would probably be able to provide further detail on what they are doing, I understand we have provided some financial support for them to look at a strategic assessment of that structure itself, which will involve things like flood studies as well, in terms of what that looks like going forward.

Melina BATH: A review is one thing, and implementation I guess is the next. Have you seen any preliminary costs on that?

Michael JENSZ: No.

Melina BATH: Right, thank you. In relation to Seymour, we heard differing views. There was a large and fulsome flood levee proposed and quite advanced. It had federal and state government funding. The Mitchell shire did an investigation and said no, but we have heard from many members of the community – Graeme Dove of Go Seymour is one – saying the council may not have made the right decision. Do you have any appetite to investigate whether that should be reviewed and then potentially implemented?

Andrew FENNESSY: I know there is a long history with the Seymour levee, going right back to 2002 I think. We always stand available as well that if Mitchell shire did want to revisit that levee – as you so rightly

say, we have provided funding before on that, we would even go down to detailed designs and even go down to looking at land acquisition issues. If they wanted to go down the path again and look at another levee or whatever that work is, we stand ready to actually –

Melina BATH: You are able to, and there were federal and state funds, significant funds. That may be insufficient. Is that still available to your knowledge? Is that held still?

Michael JENSZ: I do know that the council holds about \$500,000 worth of funding still from the initial levee stage, but that is the only funding that is available.

Melina BATH: There were some significant millions, I think. Anyway, if you can take that on notice –

Michael JENSZ: I can take that on notice and come back to you, if you like.

Melina BATH: that would be most helpful, thank you very much. You mentioned local councils in relation to levees and looking after ongoing maintenance, and I know to a question from Ms Broad the minister said:

Construction or upgrades of formally managed levees are eligible for funding under the annual Risk and Resilience Grants Program ... between the Commonwealth and Victorian Governments ... The relevant council will retain responsibility for ongoing maintenance.

Considering that you just said that there are 4000 kilometres of levees, I want you to speak to the cost shift to councils. They have got small budgets and huge recovery requirements. Do you think that communities are at risk of severe flooding if councils cannot maintain, because of that cost shifting, these levees?

Andrew FENNESSY: I would like to say up-front as well that it is still looked at. I talked about 4000 kilometres of levees. We do not see all that 4000 kilometres of levees have actually been maintained, and that is within the flood strategy itself, which needs to look at what levees are prioritised and what is seen as providing a benefit to the local communities in regard to the support being provided by these levees. As we said, we undertake the reviews. We provide the work in there for the flood studies to identify exactly what those risks are, and we have worked with a lot of communities and a lot of local governments there in being able to provide levees in those spaces. We have not had, that I am aware of, yet anyone coming back and saying that they have not entered into a levee arrangement because of the actual cost of the ongoing levee itself.

Michael JENSZ: The other thing I might add is the levee assessment program that we are currently rolling out we are funding, through four CMAs and about 16 councils, in combination with SES to look at all those levees that are in that northern area and really having a discussion about what is the condition of them. What are they being used for? Do they need to be brought into formal management arrangements to provide that protection at that level that can be relied upon? Do they not serve a purpose and we allow them to wither away? Or is there something in the middle where they may want to do something pre-event to shore up as a first line of defence effectively? Then how do we actually incorporate that in their municipal emergency management plans in terms of considering how to manage that going forward as well?

Melina BATH: There are formal management arrangements and withering away, and then councils being responsive enough in an imminent weather event. We have heard that it is very hard for councils and the Victorian community to understand when that event will happen, so how can the department provide support and guidance on their responsibilities and their mitigation activities on levees?

Andrew FENNESSY: A big part of that is talking about will they have time to respond. The category you are talking about there is are they going to shore up any levees. In the cases where you see people driving over the tops of levees to access the river and those types of signs in those known areas, that is a category that Mike just talked about then that has not really existed in the past. We are looking at those at the moment. That is what constitutes managed levees. It is where I have also come out before to say, yes, I wholeheartedly agree you do not want people out there in the landscapes as water is actually rising, trying to repair levees at that particular point in time. This information that Mike is talking about through the assessment would then sit in the local government's municipal emergency management plan, and under that plan there is what they enact as they are coming into an event. What we talked about before is what is the time and the warning levels that they need to actually instigate each one of those. So if it is going to be that they know it is coming down within a week's time or whatever the case might actually be, then they can instigate and go out and repair those particular

levees. That is what we look at here. The big part is looking to build these into the municipal emergency management plans as well to know that there is enough time to take action to mitigate any risk there.

Melina BATH: Sure. And this 17d of the 2016 flood management strategy I think is still causing a huge headache for local councils. From our hearings and listening to them, they are concerned about, again, them wearing the cost. Has the department provided any information to government around an even split of the ongoing maintenance?

Andrew FENNESSY: We have not talked to local governments in respect to an even split. The contributions that we are making at the moment are one-third from state and one-third from Commonwealth. We have not looked at the ongoing maintenance. We look at the ongoing maintenance from the point that local governments are the ones looking at how they are protecting the risk in that particular area, and they are the ones that are going to ensure that they maintain the upkeep of those particular levees through those costs.

Melina BATH: And the cost is vast. We have heard from one shire that their road maintenance – separate to your department – or road recovery is the cost of their whole entire year. So if you are adding road costs plus levees, what level of support can you, through the minister, provide to those councils that they actually will be able to do some of this work?

Andrew FENNESSY: I think a big part of this is going to be, as we are going out and doing these assessments and understanding and talking to these local governments about which ones they actually want to bring in to formal management arrangements – where are they – we can then be starting to think about what the costs are actually associated with that, how broad the issue actually is, and that will provide us further information if there is anything that needs to change in this space.

Melina BATH: Thank you. One quick question: can you please explain to the committee the proposal that is being put to Pental Island – you may need to take it on notice – landholders regarding the future funding and management of their levees?

Andrew FENNESSY: Yes, I think we can take this on notice. I do know that North Central CMA are with you this afternoon as well, and North Central CMA have been talking to the local community there around Pental Island.

Melina BATH: Thank you. I am not sure how much time I have got, Chair.

The CHAIR: Twenty-five seconds.

Melina BATH: I will cede my 25 seconds to my colleague.

The CHAIR: Thank you, Ms Bath. Ms Tyrrell with a question, please.

Rikkie-Lee TYRRELL: Thank you, Chair. And thank you, gentlemen, for joining us today. I would just first like to start with: how many hydrologists are employed in your organisation?

Michael JENSZ: In DEECA itself, I have one hydrologist who is in my team and is accredited to work in the ICC as a flood analyst. There are a variety of hydrologists across the CMAs themselves. They are all accredited as well if they work in the ICC. In addition to that, we use consultants who develop flood studies. They also can be used in a roster system and brought into the ICC in terms of providing that flood analysis advice as well. So SES maintains a roster of people. We help provide support about how to accredit them to the use of the tool itself, but then they can access that going forward as well through an event.

Rikkie-Lee TYRRELL: Okay, so prior to the flood event you were taking the advice of more than just one hydrologist?

Michael JENSZ: The advice that is provided to the ICC from the hydrologists, I do not take that advice – that goes to the ICC. They choose from a list of hydrologists who are available. A lot of them are local CMA people who have a really good knowledge of the systems et cetera because they work every day on them in terms of flood studies, planning et cetera. They are accredited into kind of the incident control centre and then provide that advice back to the incident controller in terms of advice around flooding.

Rikkie-Lee TYRRELL: Okay, thank you. I was just making sure that there was more than one that was providing advice. As long as it is challenged – just like scientists, they like to see it challenged. Do you believe that more gauges along the water systems would help in a better warning system in the future, and where do you think these water gauges should be placed?

Andrew FENNESSY: I come back to the point as well that it is always open to see whether more flood warning gauges actually are required. They would normally come out of, as I have said, the work we are doing in the flood studies, which then really feeds into the regional flood management strategies. They are then put forward to us to have the BOM undertake further work to look at what further warning systems might actually be provided in those areas. So we are always open to taking any further discussions on upgrading additional gauges within the network if they are seen as going to provide a service there.

Rikkie-Lee TYRRELL: Okay. So who is responsible if there is one that is faulty?

Andrew FENNESSY: If there is one that is faulty, that is managed under the service contract that we actually have or are running on behalf of all the 54 partners there. So if there is one faulty, then we will go out – and when I say ‘we’, it will be the contractor that we actually have in place under the state’s monitoring network – and do that. There are a couple of ways. As I said before, about 65 per cent of them actually have telemetry on them. Not all of them need telemetry; I have got to say that up-front as well. We know pretty quickly whether a gauge is not actually working and can go out and fix it. If it is not one with telemetry, it is visited at least once a month to check in on that as well. The contract that we do have under here for the monitoring network has KPIs associated with it as well, so we manage our service provider there to very tight conditions to ensure that the network is up to scratch and is available when required.

Rikkie-Lee TYRRELL: How much does a water gauge cost?

Michael JENSZ: It costs in the order of about \$15,000 to \$30,000, just depending on where the location is et cetera.

Rikkie-Lee TYRRELL: Okay. All right. Now, I have saved the purler for last. Previously Ms Lovell was talking about dam levels and who manages them and who is responsible. I was getting a little bit lost in the reply, so I am just going to ask you straight out: who is responsible for the levels? You can give me a name or you can give me their job title, but I would like to know so we can question these people, so we can find the answers that we need.

Andrew FENNESSY: Do you want to answer that, Jesse?

Michael JENSZ: Up-front it is the storage operators, and they are under our water corporations, so it is their responsibility for managing them. Jesse, do you want to add anything?

Rikkie-Lee TYRRELL: What is their job title or what is their name, please?

Jesse ROSE: I will add to that. Water corporations are responsible for storage management. Depending on which storage we are talking about, it will be a different water corporation responsible. For example, with Lake Eppalock and Lake Eildon, Goulburn–Murray Water is the appointed storage manager. With that appointment as the storage manager they have a series of obligations as part of that storage manager appointment and also bulk entitlements that confer responsibilities on to the storage manager, and those are issued by the Minister for Water in the case of the bulk entitlements and the storage manager appointments. The storage managers then within those formal appointments and settings make decisions around storage levels, releases and how much is held back, and that will vary depending on the storage. Then Goulburn–Murray Water, in the case of Lake Eildon and Lake Eppalock, will have an internal process to determine what the appropriate level is based on those formal conditions as well as their intelligence and information around forecast events.

Rikkie-Lee TYRRELL: Okay. Does flood mitigation form part of their responsibility?

Jesse ROSE: Yes, that is right. Within the primary function of the storage, being to provide a safe and secure water supply for communities, there is a secondary benefit that can be provided by storages, and that will vary depending on the nature of the storage. For example, at Lake Eppalock the capacity to actively manage that storage is limited given the infrastructure there, whereas at Lake Eildon there is some increased flexibility.

Rikkie-Lee TYRRELL: Thank you. Just to make your life even more charming, I am going to give you a bit of homework. May I please request on notice a list of who is responsible for each dam and the person or persons responsible for mitigating the flows?

Jesse ROSE: Yes, we will take that question on notice, just noting that we will provide that answer in the context of the accountabilities that the organisation has and those positions within it.

Rikkie-Lee TYRRELL: Thank you very much. And that is me.

The CHAIR: Great. Thanks, Ms Tyrrell. Ms Broad, with a question, please.

Gaelle BROAD: Thank you very much for attending today. I think we are in the final stretch, nearly. I just want to ask a few questions about northern Victoria; I have got a particular interest there. Can you tell us when the hydrological studies of Lake Eppalock will be made available to the Rochester community?

Andrew FENNESSY: We will have that completed in the end of November. Mike's team has been looking after that. Do you want to talk about it?

Michael JENSZ: Yes. The aim is to have it completed by the end of November, and after that period of time we will go out and talk to the community about what is in the report itself and seek some feedback in terms of have we missed anything in terms of capturing the advice. We have already gone out a few times to the Rochester community; I was there for a breakfast a couple of months ago just stating the progress of it. But we also need to go out and talk to other stakeholders as well – upstream and downstream – about the full effects of any change in operations.

Gaelle BROAD: Thank you very much. Post the 2011 flood there was a government-subsidised program that was put in place to build ring levees around homes – confined to homes, not larger farms – in Benjeroop and Murrabit, which proved to be successful in preventing homes from flooding in October 2022. I am interested in your thoughts. Does the department believe the government-assisted program for ring levees around rural homes that were flooded in October 2022 would be a good investment? What are your thoughts on that for a new program?

Michael JENSZ: We have identified through the development of guidelines previously that ring levees can provide some benefit to farms and communities. The advice is that we should not rely on them and build houses in areas where you are on a flood plain and then try to build a ring land – it should be retrofitted. There is not currently a program at the moment that sits around ring levees, and I think –

Gaelle BROAD: Sorry – there is?

Michael JENSZ: There is not, sorry.

Gaelle BROAD: Not. Yes.

Michael JENSZ: I think with any program we really need to think about the cost benefit of doing so and then the public-private benefit of doing those activities as well – so those things will need to be considered in any program, you would think, going forward.

Gaelle BROAD: I guess I am just interested in the after-action review. You were talking about that being reported in December. Is that something you would consider commenting on? What are your thoughts on the program for that, given that it worked previously?

Michael JENSZ: I do know that I have had some conversations with North Central CMA just around the effectiveness of ring levees, so there is a little bit of work there in terms of investigations about the benefits of those. The after-action reviews did not touch specifically on ring levees as part of those actions, but there are obviously some investigations and discussions that we have had around that with North Central CMA.

Gaelle BROAD: That is good. Now, since the 2022 floods there has been planning approved for new housing development on the flooded site at the emergency levee that was built in Echuca. Does the department think a new housing development in a flood-prone area is appropriate?

Andrew FENNESSY: I cannot comment on that specific one at the moment; that is really one that falls under the planning portfolio, so I might just leave that one.

Gaelle BROAD: That is fine. I am interested in levees. You talked about that, and you mentioned it being quite a clear process. As I have met with local communities it seems anything but clear – there are so many different organisations involved. Just as an example: Bendigo Creek has a levee. At Epsom Huntly, where there are huge developments with thousands of homes, there is currently a broken levee bank. Flood studies were done many years ago that recommended the repair of that, but nothing has been done. So with reviews and looking at maintaining them – you talked a bit about that, but there are so many different people involved. What are your thoughts on the Bendigo Creek in particular, given that it such a huge housing area?

Andrew FENNESSY: We have continued to talk to Bendigo city council about that. You are right; there is the Bendigo Creek one. From my recollection we are actually funding a detailed study for that levee at the moment.

Gaelle BROAD: Locals kind of feel that there have been so many studies done over so many years – I guess Melina sort of mentioned it – but who is actually doing the work?

Michael JENSZ: It is council's responsibility to undertake those activities. I am happy to provide you the summary of the funding that we have provided Bendigo council in the past and the progress to date. I do understand there was some discussion around alignment planning with VicTrack et cetera to make sure some of those land dealings were worked through as well. But I am happy to provide you with the full detail of where they are sitting.

Gaelle BROAD: Yes. Great. So just the funding you mention that has gone to council – was that for another study or was that to actually get work done to repair the levee bank that had been broken?

Michael JENSZ: That was for designs of a levee bank, not for repairs.

Gaelle BROAD: Okay. Do you actually manage that, the grants for the repair work?

Andrew FENNESSY: It would have to be in the context of – are they looking just to repair a breach in the levee or are they actually looking to maintain or to undertake more fundamental work on that particular levee?

Gaelle BROAD: Well, yes.

Andrew FENNESSY: That really comes to the point, because one of the issues with just maintaining particular points is it can create that false sense of security there as well. If the levee itself – and it has been built over a period of time – does not have that structural integrity, it can then just breach further down. But you probably know the Bendigo levee a bit better.

Michael JENSZ: Yes, it is really around making sure which levees we are talking about and whether or not they are under formal management arrangements or not. It is really important that we do actually have the integrity of the levee maintained from an engineering standard. We actually do provide some guidance as well in terms of what you need to think to in terms of engineering standards. Obviously councils have their own engineers et cetera in terms of the design of levees. That is kind of key from our point of view as well – going through in terms of future funding and going into that formal management arrangement to make sure that they are up to those standards.

Gaelle BROAD: Certainly at Bendigo Creek there is a section there that is as wide as from me to you. A car could drive it. It is gone. There are thousands of homes there. If we have another event where the water comes through, it is a significant risk. Locals have raised it several times because they are so concerned. There is study after study, but who is actually getting the work done? And when there are so many different groups involved – you have got Parks, you have got CMAs, the local councils – it seems to go on and on. Yes, just clarity around that would be really helpful.

Michael JENSZ: What I can say is as part of the overhaul of the levee management framework we also ensured we changed the legislation to allow people to do works on public land. You just need to go to a CMA to apply for an application to work on those, to maintain the levee back to its original purpose. Those permits are available now if somebody wants to go in and actually undertake those activities.

Gaelle BROAD: Again, it does seem to be quite a confusing process for locals on the ground. I guess being around Benjeroop too, locals talked about how there is no-one now coming to review these levees or walk across them; trees are growing up through them. So they are worried. They are like Swiss cheese, many of these levee banks. Who is actually inspecting them?

Andrew FENNESSY: That comes under the levee assessment program that we have announced. That is being undertaken by the four CMAs in the north and the 16 local governments. That is looking at the status of what they are at the moment. I take your point from before, and it is one of the things we would be looking at ourselves. If you are looking at a recommendation around this as well, we would be saying and recognising that people are seeking further clarity around levees. We know that is not the case around all the areas, but it is in some. We work closely with our other delivery agencies as well to be able to provide further clarity around what the policy is for levees.

Gaelle BROAD: Definitely. I guess there are a whole lot of different elements with levees, but certainly clarity is needed. Would you say the minster is the best one to provide that clarity?

Andrew FENNESSY: No, I would not say that. I would say that it is through us working within – when I say ‘us’, it is working across the network with delivery partners for those. As you know, flood management goes across multiple agencies, and they all have different touchpoints. We will work back in with those agencies to provide further clarity around the levee policy.

Gaelle BROAD: It is still 18 to 24 months, I think you said, with the review that you are doing with the SES looking at levees and different areas.

Andrew FENNESSY: The levee one is going to take about 18 months.

Gaelle BROAD: Okay. I did want to ask a question about – well, I guess just to your report. Are there any high-level key recommendations? You kind of mentioned one: clarity needed on levees. But are there any other key things that you could tell us that have come from that after-action review that you have done.

Andrew FENNESSY: It is not necessarily always just from the after-action review. But if I am stacking on the theme there of levees, I think it is going to be really important once we actually get to the end of doing that levee assessment or as we are progressively moving through with it that all that information is captured – that it is not lost. We need to make sure that we can capture it in tools such as FloodZoom. We also need to make sure that we capture it within local governments’ municipal emergency management plans as well so that in any future event there is clarity around who has got ownership and what the status is of those particular levees in that landscape. That is certainly one I would be recommending there as well in that same space.

Gaelle BROAD: Just with the risk and resilience grant program – you have touched on it – I think that closed in August. When is the next round of that? Is that right?

Andrew FENNESSY: We do them on an annual basis, yes.

Michael JENSZ: Yes. They are done on an annual basis. It closed on 10 August, I think. The next round will be usually the back end of the financial year.

Gaelle BROAD: Okay. And that is a shared funding arrangement with federal as well? There are different –

Andrew FENNESSY: Yes, it is.

Gaelle BROAD: And local, yes. Was there any work on levees in that round? What sort of things did you cover in that program?

Michael JENSZ: The successful applicants have not been notified yet, but typically –

Gaelle BROAD: Hot off the press – come on, Mike!

Michael JENSZ: I cannot give you the scoop, sorry. What we usually see is a mixture of the kinds of activities that are funded. It is everything from flood studies to flood warning systems, which we talked about before, and information to communities around maps et cetera, so there is a range. All of them are really tied

back to our regional flood plain management strategies, which list all the actions and the priority of those actions. They are going down the list of those actions, going through and reprioritising each year. We have done a couple of things. Last year we did a review of the mitigation actions that have been addressed across the regional strategies just to see, with the mitigation ones: is there a broad spread of activities across the state, or how is it tracking? I am happy to provide that report as well and show you to give a sense of if there are any gaping holes. We are not seeing them from that review. There is usually a broad mix depending on where the councils and communities are looking to take the next actions going forward.

Gaelle BROAD: Thank you. There is one question – I am not sure if I have time – I will ask on notice. With the rainfall gauges and streamflow gauges, we were provided a list from a lady, Jan Beer, at Seymour, which was quite detailed. But there was some feedback that perhaps they were being positioned for environmental flows rather than flood warnings. Can you speak to that?

Andrew FENNESSY: Yes. There are 11 gauges in total there that were coming out of that. They have been put in place for a project known as Constraints, which is under the Murray–Darling Basin plan – you may be familiar with that. They were being put in for the purpose of doing some assessments around releases in environmental flows, particularly around constraints, and to give us background information on that. The gauges in those particular areas really do tie back into the discussions we have had around, in particular, the Murrindindi shire there or those requests for further services in that area. And as we said before, if there are other gauges that need to be looked at for warnings within that area, we are willing to speak to the council on that. I do know that there have been two flood studies announced there as well within King Parrot Creek and Yea, in that area, which are some of the ones that Jan has been referring to there as well, which are also just going to help provide background information there to where we are actually going to best be able to situate gauges if it all possible and therefore increase flood warnings in that particular area or that service.

Gaelle BROAD: That is helpful, because I guess there are quite a few here. There are nine that I can see – the Yea River confluence with Goulburn River, King Parrot Creek, Major Creek upper catchment and Rubicon River –

Andrew FENNESSY: Yes. There have been nine that have been installed to date. There are two that still need to be installed: one is at Molesworth and one is in Yea. When I say that nine have been installed, I just need to caveat that to say that whilst they have been installed, there are further works that you need to do for calibration and those types of things. So they have been installed.

The other thing I should point out is they might not be there specifically for flood warnings and they may not be in the right locations according to the community – and that can be looked at – but any gauge within our gauge network can actually be used by BOM to undertake their analysis in any particular way. I think out of those, probably seven are rainfall gauges and that as well, so potentially, if needs be, they could do that. But I also know that one of them has only had telemetry on that as well.

Gaelle BROAD: That is helpful.

The CHAIR: Thanks, Mrs Broad. So look, there are about 15 more minutes for questions, so we might go around for a second round. The clock will beat us – we need to pull up sharp at about 11 o'clock – but I will just go round for a second round of questions. I guess I will start.

I just want you to come back to the issue around mitigation, because it is something that I think we have heard a lot about from community members. There are some very strong views around whether dams like Eildon or Eppalock should have flood mitigation roles, and you have talked about – and I think this is an important distinction for people to understand – that perhaps the primary function of a dam as a catchment is to hold water for people who have bought water and to supply drinking water. A secondary function might be for mitigation, and I think that is an important distinction. I do not think that is very well understood, but I think community definitely feel that some of the infrastructure, the dams, should have a greater mitigation role. So can you just explain – because I have heard you talk a bit about the infrastructure, and I have done some reading on this. Some dams were built in such a fashion that they cannot provide any really meaningful mitigation role and others might have some mitigation capacity, but can you just unpack that for me a bit to explain the difference – like these catchments, the dams, are not really for mitigation. And what I think people were saying to us too is, ‘If there was 10 per cent capacity, you know, the floodwater would have been in there and there would not have

been these catastrophic events.’ I do not know that that is correct, so are you able to unpack that a bit for us and just explain those differences?

Andrew FENNESSY: I might start off, and I can throw to Jesse there as well. One of the things here is that you are right that first and foremost it is there for safe and secure water for environment, for irrigators and also for urban towns. Under our entitlement framework it is fully allocated, or what we refer to as fully allocated within that system. So if you were then looking to create further headroom within storages, you then need to be saying: where are you taking that 10, 20, 30 per cent of water from, and what impacts are going to be associated with that? So you are either taking it away from town security and the risks there of restrictions; you are taking it away there from potentially irrigators, and irrigators have an entitlement and there is also a value associated with that; and equally with the environment – the environment is treated the same as any other entitlement there as well – they need the water when they actually need it. So that is one of the big things here as well, that when you are making these decisions and the balance between what we are actually looking at, it is a trade-off there of what is taking place.

Also, in some of our storages, as we have talked about – and Eppalock is one of them – we saw peak flows of 245 gigalitres, or 245,000 megalitres, at one stage. It is a 300,000-megalitre storage, so it is those sorts of things that need to be taken into consideration in how far you draw them down. It is always going to be looking at those trade-offs. As we have articulated as well, there are the two assessments taking place at the moment to look at what some of those options are, but they are some of the reasons why it is not readily accessible just to drop the levels in those particular storages.

Jesse ROSE: Yes, and I will just add to that, Andrew, if I could. We have heard from members of the Rochester community and those that live on the Goulburn River downstream of Lake Eildon as well, who have been making requests and having conversations with us around the opportunities that present there. As Andrew has articulated, that then becomes a trade-off decision, so the primary function of those storages at the moment is to provide that safe and secure water supply. Shifting that function, broadening out that storage management function to encompass flood mitigation more fully than it does at the moment, would be a shift in purpose of that structure. So before making a decision associated with that, we need to fully understand what the costs and benefits might be associated with that. So costs being forgone harvesting opportunities to entitlement holders and the community values that they support. It is also really important to understand what the potential benefits might be and how much that storage, if operated differently, could actually attenuate floods.

When we look back at the October 2022 event, we saw really significant inflows to a number of our storages. So for example, the peak inflow into Lake Eppalock was 235,000 megalitres per day. The total capacity of Lake Eppalock is approximately 300,000 megalitres. So there are physical constraints on how much these storages can provide, but as we have mentioned earlier, we have heard the calls from those communities downstream of Lake Eildon and Lake Eppalock to do that piece of technical work to understand what those costs and benefits are, and so those pieces of work are underway.

Michael JENSZ: I might –

The CHAIR: Fantastic. I am just conscious of the time, to allow other members to ask questions as well. Mr Ettershank, do you have any other questions?

David ETTERS HANK: Yes, thank you, Chair. We have heard about a new flood management plan being done for the middle and lower Maribyrnong flood plain. You talked before about sort of peer review of those, so I get that concept. I guess I am interested to know ultimately, notwithstanding the peer review process, who is actually responsible, or perhaps accountable, in terms of ensuring the quality assurance of those plans?

Michael JENSZ: The flood studies themselves? So ultimately in terms of the development of those flood studies, if they are led by councils, it is their study, and that is what engages and is put into the planning scheme. We do not provide a technical assurance – rather I do not have 15 hydrologists going through that, so that is why we have really gone through a peer review model. What we do know is that every flood study is a little bit different, and you actually do need to make sure that you have that testing of that peer review, and that is the way we provide assurances around the kind of level of robustness of those studies going forward.

David ETTERS HANK: So you have tested the Maribyrnong results against what is in the study – you have actually undertaken that review?

Michael JENSZ: No. So a new flood study will have a series of things that it needs to output and some standards that they need to adhere to. Flood studies, as we have outlined in our guidance about how to develop flood studies, need to take consideration of standards, such as the *Australian Rainfall and Runoff*. They have a series of standards and guidelines that you use to develop flood studies. That is kind of industry practice and the industry standards that are required. We stipulate that, particularly in our funding requirements, they need to use the right standards, and they also need to actually have a peer review going through. So that is how we make sure that those studies adhere to the best standards. We also go to multiple forums, international forms et cetera as well, so there is a wealth of knowledge in terms of how we actually continue to get best practice. Technology evolves, computing power gets quicker, you can do things faster, new models come along, so it is really about trying to keep up with that as well.

David ETTERS HANK: Okay. Have I got time for one more question, Chair?

The CHAIR: One minute and 40.

David ETTERS HANK: You have said that you are doing an after-action review, and that will be out in December. I am very keen to see that, so I am just putting that as a question on notice. But also that study is separate from EMV's after-action study. We have had a number of witnesses say that they are upset – a number of agencies have said that they are upset or disappointed – that the SES has not done an interagency after. But notwithstanding the SES, who actually pulls those different studies together? Is there someone that actually sort of says, 'Well, these are all the learnings from DEECA, these are the learnings from EMV, these are the learnings from SES?' Is that in place?

Andrew FENNESSY: I can really only speak for what we look at with our after-action reviews and how we actually go about them. We have looked to engage those other agencies in our reviews as well, so we will obviously work with them and share that particular information. Though within EMV I know that they do theirs slightly differently, so that is more as a real-time assessment. That is conducted under those sustained control centres actually running, so it is a real-time arrangement. That information is updated or the practices are changed as we go along. So a lot of this is coming back to the communities of practice that we might have in place; we are actually talking to each other and sharing our information. That is from my point of view. I can talk about how we share our information, and we pick up on any information coming across from other agencies as well.

David ETTERS HANK: Okay, thank you. Thank you, Chair.

The CHAIR: Thanks, Mr Ettershank. Ms Lovell with a question in the last 5 minutes.

Wendy LOVELL: Thank you. Is it fair to say that storage usage has changed dramatically since the introduction of the Murray basin plan? We are no longer just storing water for irrigation purposes. Eildon is storing significant environmental water, water from investors since unbundling, water that belongs to Melbourne Water. The change at Eppalock with the abolishing of the Rochester West irrigation scheme means that there is a lot more water being stored there for urban use in Bendigo, and probably speculator and environmental water there. What reviews have been done around the management of these storages to accommodate this change in usage?

Jesse ROSE: I will take that. Thanks for the question, and you are right; there have been and there continue to be significant changes in the way that people use water that will impact on demand. We also see changes in supply patterns coming in as well. So there are a range of different factors, including environmental water recovery and changes in policy settings. It is important to consider those are all things that will vary over time. Whilst we need to be mindful of the specific policy implications, what is important is that we have storage management settings that apply to the whole bucket of water in storage and manage those impacts, because we know that we will continue to see variations in inflows and the way that people use water. You know, things like international crop prices and land-use changes over time can also influence demand. So there are a lot of things there that we can be cognisant of but cannot predict, so we need to make sure we have the storage management settings in place that can adapt as we move through.

Wendy LOVELL: The storages used to be used, because, you know, it was store this year's water and next year's water, use this year's water, then it fills next year. Now with people actually stockpiling water in there for the environment, stockpiling water for investments, what are you doing to make sure that that airspace is

being freed up? And why wasn't the water that was released counted as an environmental flow? It was the greatest environmental flow we have had in Victoria forever. Even the ground under my house got watered, and it went right through my neighbours' houses, let alone underneath their houses. So we have had the greatest environmental flow of all time, and yet it is not counted as an environmental flow.

Jesse ROSE: When prereleases are made for the purpose of creating airspace for flood mitigation, they are not debited off a specific entitlement holder's account. So those releases are losses to the system or spills within the system rather than being taken off the environmental water holders that hold water within that storage, which is appropriate given that they hold entitlements just like any other user, and the environmental water recovery targets are cognisant of that fact, that those entitlements reflect characteristics similar to other entitlement holders within the system.

On the question of whether storage is being held in a different way now as a result of policy changes and shifts, one thing that has been suggested is that the change in carryover rules has resulted in more water being carried over. We know that in the past, before we had the individual carryover rules, water that was not used in a given year still stayed within the storage. It just was reallocated to the collective pool. What we have now is a setting where we allow individuals to better manage their own risk. So they can elect to carry that water over, and it remains in their individual account. The previous setting, where it was reallocated and then socialised back within the pool –

Wendy LOVELL: Carryover is not the problem. You know, there is a lot more water being stored for other uses than there is being carried over. Carryover is a minor thing. There needs to be a review of the whole management of those storages.

Jesse ROSE: The technical assessments that we are doing at the moment are initially looking at the view of what costs and benefits are associated with different operational structures. If the case is made that there is sufficient benefit to demonstrate a change, then how that cost is apportioned in the different policy settings will be considered as part of that. But I think regardless of those various policy settings and characteristics, we know that the storages were full at the end of last year because we had three consecutive La Niña events and then we had a really significant event in October. So some of those policy settings compared to those significant inflows are less significant potentially than those events that occurred.

Wendy LOVELL: So the decision to release 38,000 megalitres at night with no notice to those immediately below the dam wall there at Eildon – who takes responsibility for that and what is being done to compensate and to assist those farmers?

Andrew FENNESSY: That release is undertaken by GMW, as the storage operator, and I know that you have got a discussion with them this afternoon, so you might be best placed to raise that question also with GMW this afternoon in respect to that release.

Wendy LOVELL: Thanks.

The CHAIR: And I am sorry – the time has beaten us. I just want to thank all witnesses for your contributions today. You will receive a copy of the transcript for review within about a week, and we are just going to take a short break now to reset for the next witness. We will be coming back at 11:15.

Witnesses withdrew.