



Legislative Council
Environment and
Planning Committee

The 2022 flood event in Victoria

Summary booklet

Inquiry | Final Report

July 2024

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Terms of reference

Inquiry into the 2022 flood event in Victoria

On 22 February 2023, the Legislative Council agreed to the following motion:

That this House requires the Environment and Planning Committee to inquire into, consider and report, by 30 June 2024, on the state's preparedness for and response to Victoria's major flooding event of October 2022 (the Flood Event), including but not limited to the —

1. causes of and contributors to the Flood Event;
2. adequacy and effectiveness of early warning systems;
3. resourcing of the State Emergency Service, the adequacy of its response to the Flood Event and the adequacy of its resourcing to deal with increasing floods and natural disasters in the future;
4. implementation and effectiveness of the 2016 Victorian Floodplain Management Strategy in relation to the Flood Event;
5. location, funding, maintenance and effectiveness of engineered structures, such as floodwalls, rural levees and culverts, as a flood mitigation strategy;
6. Flood Event as a whole, including but not limited to, the catchments and floodplains of the —
 - a. Avoca River;
 - b. Barwon River;
 - c. Broken River;
 - d. Campaspe River;
 - e. Goulburn River;
 - f. Loddon River;
 - g. Maribyrnong River;
 - h. Murray River;
7. the 2007 decision of the Minister for Planning to approve the construction of a flood wall around Flemington Racecourse and whether the growing impacts of climate change were considered;
8. the implications for future planning decisions including —
 - a. how the Victorian planning framework can ensure climate mitigation is a consideration in future planning decisions;

Terms of reference

- b. how corporate interests may influence decision-making at the expense of communities and climate change preparedness; and
9. any other related matters.

Chair's foreword

The wettest month on record in Victoria had devastating consequences for many communities across the state. The flood event in October 2022 was a significant natural disaster. This Inquiry was an important way to give a voice to those who had lost so much because of these floods, and to help recommend ways that communities and government could better prepare for, respond to, and recover from, future flood disasters.

The stories from communities across the state were deeply impactful, as was the expert evidence received from emergency responders, local authorities, climate scientists, hydrologists, and urban planners. From that evidence it is undeniable that climate change is intensifying weather events and increasing the risks we face living in this country 'of droughts and flooding rains'.

It is also clear that in the maelstrom of this disaster a community spirit shone through. Many stories were told of people going above and beyond to help their neighbours, of mobilising all resources to protect towns, and of reaching out and ensuring that no one was left alone or abandoned in a time of crisis. However, the committee clearly heard that resilience can be tested, and community spirit must be constantly nurtured and strengthened.

Responses from government agencies must match the community focused efforts of residents. Remembering the human impact of disaster events in marshalling responses will stand response agencies in good stead for the future. Stresses and strain should be salvaged, not exacerbated, by government responses.

Not all the damage done in the October 2022 flood event was caused by nature alone.

The impact of the volume of rain that fell was exacerbated by decisions made, often years prior, on the shape of the built environment, new physical infrastructure, and by our planning system. The committee was asked to examine several of these including rural levees and culverts, and floodwalls, notably at Flemington Racecourse.

The Flemington Racecourse Floodwall increased the extent and duration of the flood in Maribyrnong. Parts of the Rivervue Retirement Village removed from a land subject to inundation overlay were, in fact, flooded less than a decade later. Releases of water from Lake Eppalock and Lake Eildon impacted local landholders and communities.

This Inquiry sought answers to the same question as many in the community—why?

The report gives a detailed account of the evidence received on each of the instances where decision making contributed to flooding.

Decisions taken more than a decade ago are often difficult to piece back together in a way that is completely satisfactory to all affected parties. From the evidence we received, notably from Tony Pagone AM KC and his independent review panel,

it is clear that mistakes were made, now with the benefit of better data and new technologies, we have a better understanding of likely effects to better inform future decision making.

Nothing can bring back the homes and businesses destroyed, nor the lives tragically lost in this flood event, but honest learning and a determination to enact change is a fitting and lasting tribute.

For government, one of the most critical roles going forward is accurately and honestly informing communities about risk. New flood modelling is being undertaken across all Melbourne catchments, and flood studies across the state should be regularly undertaken. That new information will inevitably show increased flood risk. Communities need to be properly supported through this process and community leaders need to show compassion, offer support, and avoid exploiting genuine fear and uncertainty.

Preparedness for the next disaster is another essential component of what comes from this latest experience. The VICSES and local search and rescue played a fundamentally important role in the flood response, and clearly need more funding to continue to fulfil that role into the future.

The risk ahead of us is dynamic, not static. As our climate changes and the built environment changes, so will the shape of future disasters. Learning from each disaster event can improve our preparedness for the future. One of the reasons this Inquiry was established was a belief that a disaster event of this scale needed a comprehensive review. A form of review should be part of each natural disaster response, although in the future this is probably best done within the formal structure of Victoria's emergency management framework.

For eighteen months, the Legislative Council Environment and Planning Committee has worked on this report, and our work has been informed by 880 submissions, evidence at public hearings in Rochester, Echuca, Seymour, Shepparton and Melbourne. The Committee conducted site visits in Avondale Heights, Maribyrnong, Flemington and Echuca, and heard from a wide range of witnesses, including some who appeared on more than one occasion. On behalf of the committee, I would like to thank all of those who took the time to tell us their stories and who brought their expertise to the Committee to help us inform this report.

The Committee tabled an Interim Report in April 2024 during the Legislative Council's regional sitting in Echuca. That Interim Report focused on evidence gathered and findings in relation to the floods in Northern Victoria. This Final Report has detailed findings and recommendations for the whole of the state.

I would like to thank all of my committee colleagues for their diligent work and the collegiate spirit shown throughout the Inquiry, especially Sonja Terpstra MLC who served as Chair of the Committee until November 2023 and led the Committee during the regional hearings.

Inquiries like this owe much to the hardworking staff in the Committee Secretariat, led by Manager Lilian Topic, Inquiry Officer Caitlin Connally, Research Assistant Adeel Siddiqi, Communications Adviser Ben Kimber, with administrative support led by Sylvette Bassy and the teams in Hansard and Broadcasting who helped bring the Inquiry to the communities most connected to our work. Please accept my sincere thanks on behalf of all Committee members.

Natural disasters are part our lives and flood risk is growing as the climate changes. How well we prepare, and how well we respond, is the test of our humanity.

A handwritten signature in black ink, appearing to read 'Ryan Batchelor', with a large, stylized loop at the end.

Ryan Batchelor MLC
Chair

Key pillars of disaster management: from planning to recovery

Floods are a part of life for many Victorian communities, and significantly impact those who live, work or travel on or around floodplains. Yet the scale and severity of the flood event in 2022 was unprecedented.

As our climate changes, causing weather events to become more intense and more severe, and as development changes the built environment around floodplains, the frequency and severity of flood events will only intensify. As a result, those living and working near watercourses are facing new pressures to adapt to these changes, and uncertainty that arises because of them. Communities will need to become more resilient and more prepared to respond to emergency events, and better supported to do so. Government must integrate the new climate-induced reality in each stage of its policy development: from planning, to mitigation and environmental management, through to emergency response and recovery.

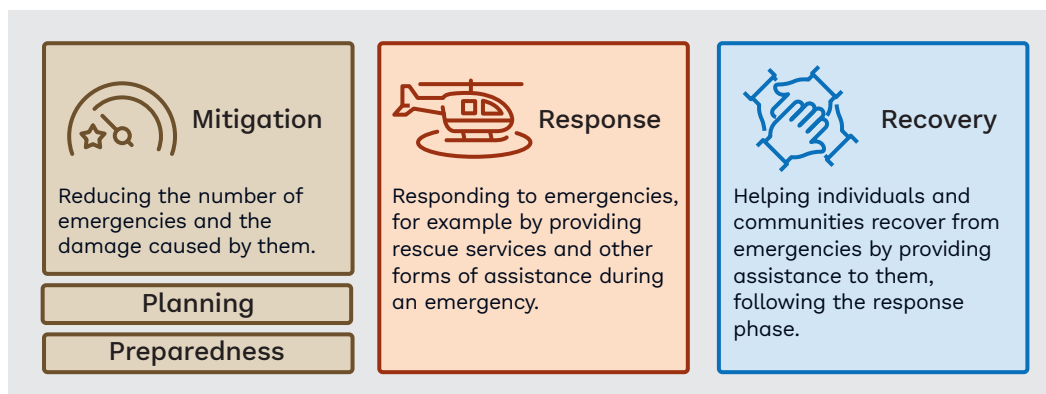
The Environment and Planning Committee's Final Report into the 2022 flood event identifies key areas for improvement in the State's approach to disaster management. This Executive Summary provides a consolidated overview of the findings and strategic recommendations from the Committee's comprehensive review. It is organised according to what the Committee believes must be the three foundation pillars of effective disaster management: that it is **integrated, community centred** and **accessible**.

The Committee believes that focusing on these key pillars would refine emergency management practices:

1. **Integrated:** fully integrated and disaster aware decision-making that efficiently aims to mitigate risk of harm, and ensures services and responses are coordinated and accountable
2. **Community centred:** fostering confidence in a system that meets and adapts to community needs
3. **Accessible:** expanding the reach of services and information, ensuring understanding and visibility in the community of available services, and ensuring services and information are targeted at all members of the community.

Emergency management covers the spectrum of emergency activities from preparedness for a possible crisis through to recovery in its aftermath. The figure below shows the phases of an emergency management response. The pillars identified by the Committee should be prevalent across all phases.

Phases of emergency management



Source: Legislative Council Environment and Planning Committee. Adapted from the Victorian State Emergency Management Plan.

The 2022 flood event in Victoria

October 2022 saw one of Victoria's most severe flooding events, affecting communities across the state, from urban cities to rural agricultural zones. The floods were primarily triggered by an extraordinary rainfall event on 12 and 13 October, compounded by conditions where catchments were already saturated.

A rare triple La Niña event, a negative Indian Ocean Dipole, and a positive Southern Annular Mode converged to produce exceptionally high rainfall across the region. Over just two days, on 12 and 13 October, intense rain fell on already saturated grounds and full reservoirs, leading to rapid river overflows and extensive flooding from Melbourne to Northern Victoria.

The flooding in 2022 devastated Victoria, affecting 81% of local government areas. Major population centres in metropolitan Melbourne and Northern Victoria were affected, including Maribyrnong, Rochester, Seymour, and Greater Shepparton.

The impact on communities was devastating. Towns such as Rochester and Seymour were inundated, with nearly every dwelling in Rochester affected in some way. Maribyrnong was faced with a quick evacuation in the early hours of 14 October when many residents were asleep and may not have received warnings. The floods caused significant damage to homes, infrastructure, and led to a loss of life; creating widespread disruption and displacement. In agriculture, the effects were equally severe. The flooding led to the loss of thousands of livestock and the destruction of vast areas of crops and pasture, dealing a heavy blow to the Victorian economy.

The aftermath of the floods brought to light several critical issues, particularly concerning emergency management and water reservoir policies. Flood-affected communities grappled with challenges in insurance coverage and affordability, while questioning the efficacy of water management practices that they believe failed to mitigate the flood's impact. The extensive damage and the prolonged recovery process has highlighted the need for improved flood preparedness and infrastructure

resilience, prompting calls for a comprehensive review and overhaul of existing flood management strategies. The 2022 flood event underscored the urgent need for enhanced planning and proactive measures to protect vulnerable communities against the increasing frequency of extreme weather events.

In its Interim Report and this Final Report the Committee has looked at a very broad range of issues generated by the floods in Victoria in 2022 and the response to them from official bodies and communities. The engagement with this Inquiry from affected communities has seen an unprecedented contribution from stakeholders. More information on the contribution can be found in Chapter 1.

This Executive Summary does not focus on each individual chapter of the Report or on individual findings and recommendations. Those are collated from page xxvii. This summary focuses on what the Committee has identified as the crucial three pillars, outlined above, that must be in place to guide emergency management responses to any event, but particularly to flood emergencies.

Integrated disaster preparedness

Awareness of disaster risk, and preparedness for those risks, should be fully integrated into policy development and decision-making processes. In doing so, the Victorian Government can ensure that its operational procedures consider disaster risk at every stage, upgrade essential infrastructure, and streamline roles and responsibilities to facilitate a rapid and coordinated response during emergencies.

Key findings underscore the necessity for these improvements, showing that decision-making that does not account for flood risk puts communities in peril, revealing gaps in current flood management strategies and the urgent need for updated infrastructure to cope with evolving flood risks.

Planning decisions require careful consideration in floodplains, and it is a risk in itself to rely on modelling changes or mitigation activities to say that risk has abated.

Several issues were identified concerning the efficiency and effectiveness of flood response infrastructure and procedures. A recurring theme was the inadequacy of existing mitigation infrastructure and its maintenance, highlighted by frequent breaches and confusion over ownership and responsibilities.

Additionally, the lack of a publicly accessible statewide database of flood risk information limits public and local government access to crucial data, complicating preparedness and response efforts.

A more integrated approach requires:

- decision-making that considers the growing nature of flood risk as the climate changes, leading to better initial decisions
- limiting inappropriate new housing and business developments inside 1% annual exceedance probability (AEP) floodplains

- meaningful community engagement at all stages of the process
- the development of a publicly accessible flood risk database to establish a single source of trusted information
- communities supported to be better prepared to manage a crisis when it occurs
- clear responsibilities for maintenance and management of flood mitigation infrastructure
- better coordination and communication throughout official and community channels
- reforming strategies for rebuilding infrastructure beyond a like-for-like approach to enhance resilience against successive flood events, described as betterment.

Recommendations to address the Committee's determination for a more integrated emergency response include:

- **Increasing Public Preparedness and Clarity (Recommendation 6):**
This recommendation arises from findings indicating a general lack of clarity about the roles and responsibilities of various government departments during emergencies. By clearly stating the operational role and responsibilities of each emergency service in preparation for a flood emergency, and outlining the appropriate chain of command, the Victorian Government can ensure that communities are better prepared and more responsive during crisis.
- **Consider Flood Risk in Decision-Making (Recommendations 11, 15):**
Decision-making needs to fully and properly account for current and future flood risk, especially as the climate and built environment change. Limiting inappropriate new development in floodplains is an effective first step in mitigating and minimising future risk.
- **Updating Flood Management Strategies (Recommendations 3, 4, 5, 7, 8, 9, 12, 13, 17):** Responding to findings that existing flood management strategies and tools, such as FloodZoom and the Victorian Flood Database, are outdated or limited in accessibility, these recommendations emphasise the need for comprehensive reviews and updates. This includes conducting a comprehensive assessment and update of flood studies to inform planning, decision-making and disaster response, integrating flood studies into planning schemes and enhancing the public accessibility of flood risk data.
- **Infrastructure Reviews and Updates (Recommendations 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37):** Much of the critical infrastructure such as levees, dams, and culverts has been found inadequate in recent flood events (including in 2022), necessitating a review and potential overhaul of management strategies. Proposals include developing new initiatives like ring levee programs and reviewing levee management arrangements.

- **Funding and Administrative Reforms (Recommendations 39, 40):** In light of findings highlighting inefficiencies in funding and administrative processes for disaster recovery, these recommendations aim to streamline these processes. This includes simplifying the application procedures for disaster recovery funding and enhancing support mechanisms for infrastructure resilience projects.
- **Operational Improvements (Recommendations 41, 42, 43, 44, 45, 46, 47, 48, 49, 50):** Findings from the Inquiry point to operational challenges with emergency tools and systems, such as gauge networks and sandbag distribution, during the 2022 floods. Recommendations focus on improving these systems to ensure they are more effective and responsive in future crises.

By addressing these key areas, Victoria can enhance its emergency management framework to be more robust, responsive, and resilient, thereby significantly improving its ability to mitigate risks and reduce the impact of disasters on communities statewide.

Community-centred emergency management

A community-centred response is crucial in ensuring that emergency management not only addresses physical risks but also effectively engages with communities and supports the psychological and social needs of those affected. This approach prioritises understanding, preparing, and actively supporting individuals, especially vulnerable populations, during emergencies. Findings from the 2022 flood event highlighted several areas where a more community-centred approach would have significantly enhanced the effectiveness of response strategies, particularly in terms of community engagement, support, and housing solutions for vulnerable groups.

The importance of a community-centred response was particularly highlighted in relation to the Inquiry's findings around the inadequacy of current evacuation processes and support mechanisms during the flood event. Residents reported significant trauma associated with rapid evacuation, and others such as people with disability reported that their needs were not considered or planned for at all. This highlights the necessity for more sensitive and well-planned evacuation warnings and processes that consider the emotional and physical wellbeing of individuals.

The 2022 flood event exposed significant gaps in the support structures for affected communities, from preparedness through to recovery. Many residents continue to experience mental health challenges and trauma from their experiences during the floods. Delays and complexities in accessing financial support further exacerbated the distress of affected individuals and businesses.

To foster a community-centred response, the Committee's findings showed a clear imperative to:

- enhance the capacity and training of the Victoria State Emergency Service, particularly in volunteer recruitment and support

- simplify processes for accessing financial aid to ensure timely and less burdensome support for recovery
- increase support mechanisms that address both the practical and emotional impacts of disasters, focusing on mental health and community resilience.

Recommendations aimed at fostering a community-centred response include:

- **Community Engagement and Support (Recommendations 6, 16, 48, 49, 51, 53, 54, 55):** These recommendations stem from findings that highlighted a lack of understanding among residents and business owners regarding flood risks and preparedness. There is a clear need for improved community awareness and engagement initiatives. These recommendations suggest developing programs that not only educate but also actively involve communities in emergency planning and response processes. Enhancing the operational capabilities of the Victoria State Emergency Service by ensuring better resourcing and support, establishing cross-border emergency support systems, and increasing the readiness of high-risk areas for emergency scenarios are key components.
- **Housing and Vulnerable Populations (Recommendations 22, 23, 63):** Vulnerable communities are often disproportionately affected by disasters, as observed during the aftermath of the 2022 floods where the impact on housing stability was profound. Recommendations focus on funding resilient housing solutions, such as retrofitting homes to withstand floods. Additionally, these proposals include a critical review of housing support frameworks to ensure they adequately meet the needs of impacted populations, emphasising the importance of accessible and sufficient support in recovery phases.

By implementing these recommendations, Victoria can enhance its approach to emergency management, ensuring it is not only effective in managing the physical aspects of disasters but also in addressing the emotional and social impacts on communities.

Accessible emergency management

Ensuring accessibility in emergency response is crucial for enabling all community members, regardless of their location, abilities, or resources, to receive and understand emergency information and services effectively. This approach is central to creating an inclusive emergency management system that addresses the needs of diverse populations. The findings from the 2022 flood event highlighted gaps in the accessibility of emergency information, particularly for individuals with disabilities, those in remote areas, and non-English speakers.

The dissemination of emergency information during the flood event was inconsistent and confusing for many residents, with some communities receiving delayed or inaccurate warnings. This inconsistency hindered timely and informed decision-making, impacting the effectiveness of the emergency response.

The Committee's findings suggest a need for:

- standardising the clarity and timeliness of emergency warnings and information across all platforms
- enhancing public awareness of reliable information sources, thus reducing reliance on unofficial channels like social media
- ensuring that all community members have equal access to critical information, especially in diverse linguistic and socio-economic groups.

Recommendations aimed at enhancing accessibility include:

- **Enhancing Information Accessibility (Recommendations 7, 10, 12, 44, 45, 46):**
These recommendations address findings that revealed challenges in the distribution and clarity of emergency warnings and information during the flood event. There was a noted inconsistency in the transmission of emergency warnings, with some communities receiving excessive or conflicting information while others received limited or delayed warnings. To improve this, recommendations include funding and developing publicly accessible flood data to provide easy access to flood risk information. Reviewing the accessibility of this information for individuals with disabilities is crucial to ensure that everyone can prepare for and respond to emergencies effectively.
- **Overhauling Emergency Communication Systems (Recommendations 47, 52):**
Findings indicated that the current emergency communication systems do not adequately serve all demographic groups, particularly in rural and remote areas affected by digital connectivity issues. Recommendations propose a comprehensive review and overhaul of these systems to ensure they are inclusive and capable of reaching all community segments. This includes the installation of new technologies and the enhancement of existing systems to provide real-time, accurate, and easy-to-understand information across various platforms.
- **Multi-faceted and Inclusive Warning Systems (Recommendations 46, 47):**
The need for a more inclusive emergency warning system was highlighted by findings showing that some community members had difficulty understanding flood warnings due to language barriers or the complexity of the information presented. Recommendations call for the creation of a multi-faceted warning system that includes real-time translation of warnings into multiple languages and delivering information in formats accessible to people with different disabilities.

By implementing these recommendations, the Government can significantly improve the accessibility of its emergency management systems, ensuring that every community member, regardless of their circumstances, can access critical information and services in times of crisis. This will not only enhance the State's capacity to respond effectively to emergencies but also ensure that its approach is equitable and inclusive.

Certain planning decisions and flood impacts

The Inquiry heard significant evidence around two key planning decisions that affected residents in Maribyrnong and surrounds during the October 2022 flood event—the construction of the Flemington Racecourse flood wall and the decisions about the flood overlay at the Rivervue Retirement Village.

The Report is clear that the Flemington Racecourse flood wall did increase the extent and duration of the October 2022 flood event for residents in the Maribyrnong Township, by an average of 1% in flood extent, and 2% in flood depth. The associated mitigation works (including at nearby culverts) were largely ineffective in offsetting these impacts as intended. Modelling shows these effects for the Maribyrnong Township will increase in the future in more severe flooding events. Modelling also shows that the racecourse flood wall has a ‘shielding’ effect for residents in Kensington Banks in 1% AEP floods. In light of these findings, the Committee recommends that the flood wall’s efficacy should be considered as part of a review of mitigation across the catchment.

The decision to remove the flooding overlay at the Rivervue Retirement Village is more opaque.

The Committee heard evidence that the owners of the Rivervue Retirement Village made a request to remove the flooding overlay (LSIO) at the site. That request was based on the completion of earthworks intended to mitigate flood risk at the site. Melbourne Water did not object to the LSIO removal, and the Moonee Valley City Council decided to remove the overlay.

Melbourne Water’s lack of objection to the LSIO removal was based on data from 2003 modelling that was itself inaccurate. Members of the Maribyrnong Flood Review Panel gave evidence that the 2003 model was not calibrated properly, and Melbourne Water advised it relied on this modelling to base its decision to not object to the overlay removal following the completion of the site earthworks.

Mistakes were clearly made in the calibration of the 2003 flood model, and there was a reliance on mitigation works on the site that were not effective.

The Rivervue Retirement Village site is within the flood zone identified by the new Melbourne Water modelling for 1% AEP in 2024.

Both of these situations raise questions about reliance on the effectiveness of mitigation works to reduce risk as a justification for approving planning decisions in floodplains.

A note on climate resilience

Technology is giving us new insights and detail not previously available to consider future risk. Flood modelling is another example of where new technology and new data can be used to gain a better appreciation of future risk.

During the Committee's final hearing on 10 May 2024, the Committee heard from Melbourne Water and expert members of the Flood Review Panel. Updated modelling of the Maribyrnong River was released by Melbourne Water prior to the hearing. This included 2024 modelling and 2100 modelling, which took account of climate change considerations. The modelling clearly signals that flood risk is becoming more unpredictable with climate change. Evidence from independent experts on the Flood Review Panel was they were 'very confident' in the modelling and the questions it resolves.

The increased flood risk identified by the new modelling will clearly be challenging for many in local communities to receive. The updated flood model for the Maribyrnong is just the first of these new models being prepared across metropolitan Melbourne. As Melbourne Water completes new and updated modelling across all of its catchments, other communities are likely to face similar challenges.

The Committee has embarked on another inquiry into climate resilience. The Terms of Reference for that inquiry can be found on the Parliament's website. The inquiry calls on the Committee to investigate the main risks facing Victoria's built environment and infrastructure from climate change and the impact these will have on the people of Victoria. This includes how the Government is preparing for these impacts, the barriers in upgrading infrastructure to become more resilient to the impacts, and preparedness for future climate disaster events.

The Terms of Reference for the *Inquiry into climate resilience* will allow the Committee to look more closely at the updated flood modelling in the context of infrastructure and planning, in Melbourne's catchments and also as modelling becomes available in other parts of the state. Issues that have arisen around infrastructure, such as the Flemington Racecourse flood wall and the mitigation measures which were unsuccessfully undertaken in relation to it, could be investigated further in that inquiry.

Findings and recommendations

2 The October 2022 flood event

FINDING 1: October 2022 was the wettest month ever in Victoria since records began in 1900. The climatic conditions were unprecedented, and rain fell on already saturated ground, creating uniquely devastating flood conditions. **25**

FINDING 2: The 2022 flood event affected 63 local government areas and one alpine resort, representing 81% of all local government areas in Victoria. **27**

FINDING 3: Over 5,000 culturally significant Aboriginal heritage sites were impacted by the 2022 flood event. **27**

3 Victoria's flood governance arrangements

FINDING 4: The Victorian Government did not initiate a review of the 2022 flood by the Inspector-General for Emergency Management. **62**

RECOMMENDATION 1: That, following a significant natural disaster such as the 2022 flood, the Inspector-General for Emergency Management conduct a review at an appropriate time to provide feedback for continuous improvement. **62**

RECOMMENDATION 2: That the Victorian Government confirm the powers of the Inspector-General for Emergency Management to undertake reviews on a self-referral basis or, if such powers do not exist, to legislate to provide these powers. **62**

FINDING 5: In many regional areas where there is a shortage of State Emergency Service volunteers, Country Fire Authority brigades stepped in to assist and in many cases were the lead agency on the ground responding to the floods. **63**

RECOMMENDATION 3: That the Victorian Government consider all the evidence, findings and recommendations from this Report when developing a new Victorian Floodplain Management Strategy. **65**

RECOMMENDATION 4: That the new Victorian Floodplain Management Strategy detail the coordination responsibility of the Victorian Government to ensure all flood studies for all local government areas are fully funded and completed. **65**

RECOMMENDATION 5: That the Victorian Government make public the internal, de-identified after-action review conducted by the Department of Energy, Environment and Climate Action. **71**

RECOMMENDATION 6: That the Victorian Government clearly state the operational role and responsibilities of each emergency service in preparation for a flood emergency, outlining the appropriate chain of command, communication protocols, and engagement with the local community. **83**

4 Planning and flood risk

FINDING 6: Flood studies are an effective tool for assessing flood risk. However:

- they must use up-to-date methodologies, technology, and data
- there needs to be statewide coordination of the frequency they are conducted
- there should be statewide funding to ensure they are kept up to date. **94**

RECOMMENDATION 7: That the Victorian Government ensure regional catchment management authorities, with local councils, are funded and resourced to conduct and implement up to date flood studies on a regular basis. **94**

RECOMMENDATION 8: That the Victorian Government require peer review of publicly funded flood modelling as part of the next Victorian Floodplain Management Strategy. **94**

RECOMMENDATION 9: That Melbourne Water and other floodplain management authorities review flood models every five years and update the models at least every 10 years and after the occurrence of a major flood. **94**

FINDING 7: Since the integration of the Victorian Flood Database and Melbourne Water’s Flood Database into FloodZoom, there is no sufficiently publicly accessible statewide database of flood risk information and maps. FloodZoom is limited to flood analysts, particularly those deployed in the State Control Centre and incident control centres. **98**

RECOMMENDATION 10: That the Victorian Government provide Victorians with access to appropriate data contained within the FloodZoom platform. **98**

FINDING 8: Vendor disclosure statements under the *Sale of Land Act 1962 (Vic)* do not adequately disclose flood risk to purchasers of lands. **100**

RECOMMENDATION 11: That the Victorian Government introduce amendments to the *Sale of Land Act 1962 (Vic)* to require vendor disclosure statements to include a simple statement on flood risk. In addition, houses or dwellings previously flooded must be included in any vendor declaration statement. **100**

RECOMMENDATION 12: That Emergency Management Victoria work with local government authorities and local State Emergency Service units to provide access to local flood guides to all residents in a flood zone, that identify the likely flood impacts on individual properties. **102**

RECOMMENDATION 13: That the Victorian Government improve individual and community awareness about their own roles and responsibilities in emergency management, and make available information resources for preparing for flood and other emergencies. **103**

RECOMMENDATION 14: That the Victorian Government require the emergency management sector to ensure that the needs of vulnerable communities including people with disability are included in all disaster preparation and response plans and ensure that sufficient funding is available to make all disaster emergency responses inclusive for people with disability. **105**

RECOMMENDATION 15: That the Victorian Government provide flood risk and planning information in a way that is appropriately accessible to people with additional needs, including people with disability. **105**

RECOMMENDATION 16: That the Victorian Government ensure early warning systems include consideration of a voluntary register of people in need of additional support to receive early warning and support during natural disasters. **105**

RECOMMENDATION 17: That the Victorian Government fast-track the implementation of flood studies into planning schemes. This should be done cooperatively with local councils and relevant stakeholders, group together flood studies into regional amendments, and use the Minister for Planning's powers as required, within two years of completion. **128**

RECOMMENDATION 18: That the Victorian Government introduce amendments to the *Planning and Environment Act 1987* (Vic) and Victoria Planning Provisions so that planning and other authorities must address climate change at all levels of the planning process. **133**

RECOMMENDATION 19: That the Victorian Government work with floodplain management authorities and climate scientists to understand how flood modelling can be used to better predict the impact of climate change on flooding and update its flood management policies in line with this understanding. **133**

RECOMMENDATION 20: That regional local councils work closely with their regional catchment management authorities to better understand, manage, and mitigate the risk of building on floodplains in regional Victoria. **140**

FINDING 9: Limiting inappropriate new development in flood-prone areas is an effective first step in minimising future flood risk. **144**

RECOMMENDATION 21: That Victoria's strategic land use planning limit inappropriate new housing and business developments inside 1% AEP floodplains. **144**

RECOMMENDATION 22: That the Victorian Government support residents within 1% AEP floodplains, including with funded programs, to manage the risk facing their existing properties and make their properties more flood resilient. **144**

FINDING 10: Due to the interconnectedness of the two systems, any flood-related changes to Victoria's planning system should require changes to building standards and regulation to ensure the changes are compatible and effective between the two systems. **145**

FINDING 11: Urban planning changes need to be rapid, statewide, consistent and systemic. Asking local councils and communities to manage land use planning and hazard management alone is unsustainable given the issues regarding climate disasters impact much bigger geographic areas than a single local government area. **146**

RECOMMENDATION 23: That the Victorian Government fund a resilient homes program to raise or retrofit residential properties at risk of flood inundation, and which prioritises homeowners affected by the 2022 flood event. **148**

FINDING 12: There was inadequate record keeping regarding the planning approvals and decision-making process used by Melbourne Water regarding the Rivervue development resulting in a lack of transparency about the decision-making process. **159**

FINDING 13: According to Melbourne Water’s updated modelling of the Maribyrnong River, approximately 850 additional properties in Kensington Banks would flood in a 2024 1% AEP flood scenario, and the modelling suggests the Flemington Racecourse flood wall provides a ‘shielding’ effect to these residents of around 5 cm in flood depth. **166**

FINDING 14: Although it was not within the pre-existing land subject to inundation overlay, the Rivervue Retirement Village would flood in a 2024 1% AEP flood scenario, and there is a likelihood that its exclusion from the pre-existing overlay was due to an error in the calibration of the previous model. **167**

FINDING 15: Modelling of the Maribyrnong River shows that, despite the Flemington Racecourse flood wall, the racecourse will flood in both a 2024 and 2100 1% AEP flood scenario. **167**

FINDING 16: Updated modelling of the Maribyrnong River demonstrates that climate change has had a profound impact on flood risk in the area since 2003 and is predicted to worsen flood depth and extent into the year 2100. **169**

FINDING 17: The use of strategic land use planning to mitigate flood risk requires the Victorian Government and planning authorities to consider the effects of climate change as well as projected changes to land use over time. **176**

RECOMMENDATION 24: That the Victorian Government require planning authorities, floodplain management authorities and other relevant actors to take account of the change in land use and especially projected changes to land use when setting flood levels for planning and development and the application of the land subject to inundation overlay. **176**

5 Flood mitigation infrastructure

RECOMMENDATION 25: As part of the development of the new Victorian Floodplain Management Strategy, that the Victorian Government review the operation of the last Strategy, in consultation with local councils, community representatives, expert advisory groups and other relevant stakeholders. **182**

RECOMMENDATION 26: That the Victorian Government's review of the last Victorian Floodplain Management Strategy (and development of the new Strategy) examine levee funding and management arrangements to determine if they are still fit for purpose based on new information and insights from the October 2022 flood event. **191**

RECOMMENDATION 27: That the Victorian Government fund floodplain managers to develop maps modelling scenarios demonstrating the impact on landholders of specified levee breaches. **194**

FINDING 18: That of the 4,000 kilometres of levee banks in rural Victoria, approximately half occur in the Loddon and Avoca catchments where, in the absence of sufficient levee protection, flood waters will remain for extended periods impacting agricultural land. **196**

FINDING 19: The existing policy framework under the Victorian Floodplain Management Strategy places a significant responsibility on rural councils and landowners to manage their own levee systems. This has resulted in inadequately maintained levees, contributing to extensive breaches in October 2022 and greater financial pressure on councils and landowners for repairs. **199**

RECOMMENDATION 28: That the Victorian Government review the Victorian Floodplain Management Strategy to examine issues around rural levee management. This should include the roles and responsibilities of local councils and private landowners and consider the adequacy of taxpayer support for maintaining these systems. **199**

RECOMMENDATION 29: That the Victorian Government fund the pilot of a ring levee development program in Northern Victoria to protect house and curtilage in flood-prone areas. **200**

FINDING 20: While the temporary levee in Echuca did mitigate flooding for most of the town, approximately 190 properties were significantly negatively affected. The lack of proper warning, inadequate support, and insufficient resources for those facing inevitable inundation contributed to a sense of abandonment among affected residents.

204

FINDING 21: The construction of the temporary levee in Echuca exhibited clear deficiencies in communication and planning surrounding the levee's construction. The decision-making process was not transparent, and the roles and responsibilities of various agencies during the emergency response were unclear, leading to confusion and uncertainty among residents.

204

FINDING 22: A range of stakeholders along the middle and lower Maribyrnong catchment believe that the Flemington Racecourse flood wall exacerbated flooding in surrounding areas.

213

FINDING 23: During the 2022 flood event, the Flemington Racecourse flood wall contributed to an increase of 1% in flood extent and approximately 2% in flood depth in affected areas.

222

FINDING 24: The compensatory measures implemented alongside the Flemington Racecourse flood wall were largely ineffective. These measures only reduced flood levels by a few millimetres, far less than initially projected, indicating a need for more robust flood mitigation strategies in the future.

222

RECOMMENDATION 30: That the Victorian Government ensure that future flood mitigation efforts include updated and rigorous hydraulic modelling before implementation, ensuring the effectiveness of compensatory measures. Additionally, these strategies should undergo independent peer review to validate their expected performance.

223

RECOMMENDATION 31: That the Victorian Government ensure that major flood mitigation measures be assessed and reviewed to ensure they perform as intended.

223

RECOMMENDATION 32: That the efficacy and impact of the Flemington Racecourse flood wall be considered as part of Melbourne Water's review of mitigation in the Maribyrnong River catchment announced following the updated flood modelling.

223

FINDING 25: There is strong local community sentiment that Lake Eppalock should remain at no more than 90% capacity at times of expected high rainfall. **231**

RECOMMENDATION 33: That the Victorian Government further investigate options for increasing outlet capacity at Lake Eppalock. This investigation should involve:

- conducting a cost-benefit analysis to evaluate financial feasibility
 - extensive stakeholder engagement to gather input from affected parties and communities
 - examination of environmental effects
 - environmental risk assessments to understand potential impacts on local ecosystems, wildlife and water quality
 - reviewing water-sharing arrangements to ensure:
 - appropriate adjustments to maintain equitable water distribution and
 - compliance with legal and regulatory requirements.
- 231**

FINDING 26: Around the 2022 flood event, inflows to Lake Eildon were significantly higher than releases. While the releases from Lake Eildon contributed to flooding immediately downstream of the storage, the timing of these releases reduced the severity of the flood peak further downstream including at Seymour and Shepparton. **239**

RECOMMENDATION 34: That the Victorian Government ensure that, for future events that are expected to replicate high storage and high rainfall conditions, new temporary operating rules for water storage and release are developed. These new rules must take account of the interest of those who are affected by Eildon and Eppalock’s storages including downstream landholders and water entitlement holders. **239**

FINDING 27: There is notable community concern that the current maintenance of culverts is inadequate and eroding their capacity to provide flood mitigation during an event. In October 2022, there were several instances of blockages or other maintenance issues causing culverts to operate ineffectively. **243**

FINDING 28: Improving the maintenance and implementation of culverts is a potential avenue for embedding a betterment approach to flood mitigation infrastructure updates. **243**

RECOMMENDATION 35: That the Victorian Government ensure that the state's existing culvert infrastructure in high-risk flood areas is fit for purpose, and that the Government also consult with local councils and other relevant stakeholders and prioritise betterment in any upgrade works deemed necessary. **243**

RECOMMENDATION 36: That the Victorian Government audit transport links in and out of disaster-prone areas. **243**

FINDING 29: Confusion about the ownership and maintenance of flood mitigation infrastructure has led to ineffective management and upkeep of these assets. The lack of formal or unclear management led some sites to deteriorate, making them ineffective in providing mitigation during the October 2022 flood event. **246**

RECOMMENDATION 37: That the Victorian Government clarify responsibility for flood mitigation infrastructure, with clear accountability and transparency for who is responsible for each asset. **246**

FINDING 30: The application process for funding under the Commonwealth-State Disaster Recovery Funding Arrangements poses a significant administrative challenge for local governments who bare the evidentiary burden. This is compounded by the broader difficulties of councils to sustain recovery efforts, rebuild mitigation infrastructure, and resume business-as-usual activities following a disaster. **251**

RECOMMENDATION 38: That the Victorian Government work with the Commonwealth Government to ensure the Disaster Recovery Funding Arrangements are not unduly burdensome. **251**

FINDING 31: A like-for-like approach to rebuilding mitigation infrastructure following a flood event is inadequate. There is a clear pattern of infrastructure failing to withstand successive flood events, resulting in repeated damage and economic losses. **255**

RECOMMENDATION 39: That the Victorian Government prioritise investment in betterment projects to improve the resilience of mitigation infrastructure, and in doing so work with the Commonwealth Government to achieve this goal. **255**

RECOMMENDATION 40: That the Victorian Government adapt policies and funding models to prioritise betterment initiatives, including ensuring that financial resources are allocated effectively to meet long-term needs of at-risk communities, and in doing so work with the Commonwealth Government to achieve this goal. **255**

6 Flood emergency warnings

FINDING 32: The transfer of State-owned rain and river gauges into the Bureau of Meteorology’s existing flood warning network is an appropriate measure to improve the communication of flood warnings. 260

RECOMMENDATION 41: The transfer of ownership and responsibility for public gauges to the Bureau of Meteorology should be completed as a priority, and the Victorian Government should request the Commonwealth Government provide a public update by the end of 2024 on these transfer timelines. 260

FINDING 33: Many stakeholders advocated for the urgent expansion of Victoria’s rainfall and streamflow gauge network. Gaps in gauges can result in inaccurate or delayed flood predictions and flood warnings to communities. 263

FINDING 34: Telemetric-equipped gauges provide important real-time data to inform flood predictions and response actions. However, in 2022, in parts of Victoria, gauge failures led to inaccurate forecasts potentially hindering community preparedness. 264

RECOMMENDATION 42: That the Victorian Government identify and fill critical gaps in the state’s gauge network. New gauges should be installed in priority locations as soon as possible, and existing gauges should be upgraded with telemetry services. Information from flood gauges and telemetry services should be easily accessible by the public. 264

FINDING 35: The 2022 flood event was the first time the new protocols under the Australian Warning System were used for a large scale flood event. 280

FINDING 36: It was difficult for the Committee to determine the adequacy of emergency warnings issued during the 2022 flood event because data is collected across disparate agencies and is not consistent. 282

FINDING 37: During the 2022 flood event, the transmission of emergency warnings was inconsistent across affected communities. Some areas received excessive warnings from competing sources whilst others received incorrect, limited or delayed warnings. In both circumstances communities experienced a degree of confusion which limited people’s capacity to make informed decisions. 284

RECOMMENDATION 43: That the Victorian Government use the experience of warnings transmitted during the 2022 flood event to identify and adopt best practice for community warning frequency. **284**

FINDING 38: Stakeholders reported that during the 2022 flood event, delayed or inaccurate information on the VicEmergency service added to the confusion among affected communities making it more difficult to make informed decisions. **288**

RECOMMENDATION 44: That the Victorian Government improve the accuracy, timeliness, and relevance of the VicEmergency service during an emergency. In doing so, the Government should actively seek input from non-government and government stakeholders to ensure that the service can meet the diverse needs of different communities during a crisis. **288**

FINDING 39: The national Emergency Alert system is an important tool for supporting a multi-pronged approach to warnings during a crisis. However, it is subject to some limitations, notably its reliance on land-based reception and limited capacity to sustain multiple alert campaigns simultaneously. **292**

FINDING 40: The development of a National Messaging System is an important forward-looking initiative to improve warnings during a natural disaster, however, any system must ensure it is addressing the constraints and limitations currently experienced under the Emergency Alert system. **292**

FINDING 41: During the 2022 flood event, social media played an important role in disseminating information. However, its unregulated nature meant it contributed to the spread of misinformation leading to heightened confusion and uncertainty. **296**

FINDING 42: Social media cannot replace official warning channels as the primary source of information during a crisis event. It is important that official sources take a proactive approach to communication to prevent residents relying on social media. **296**

FINDING 43: During the 2022 flood event, the adequacy and effectiveness of early warnings varied from municipality to municipality. Some communities experienced timely and accurate information whilst others lacked sufficient information. **298**

FINDING 44: Early warnings issued during the 2022 flood event demonstrated several issues:

- inconsistent dissemination and clarity of warnings and information
- information was delayed or inaccurate, or did not contain sufficient detail for the public to make informed decisions
- some community members lacked awareness of where to access information, resulting in some over-relying on social media information.

299

RECOMMENDATION 45: That the Victorian Government improve the flood warning system so that warnings are:

- accurate with the most up-to-date information
- delivered in a timely way
- clear and easily understood
- consistently disseminated across different communities
- accessible in relevant formats and languages, where appropriate.

299

FINDING 45: There is a disconnect between emergency warning communication methods and the needs of diverse communities, and an urgent need for a more inclusive approach to emergency communications.

302

FINDING 46: During the 2022 flood event, there were reported instances where people were unable to understand flood warnings and information due to accessibility barriers.

302

RECOMMENDATION 46: That the Victorian Government ensure the emergency warning system is inclusive and able to be used by all Victorians, and should:

- include real-time translation of warnings into multiple languages during a crisis event
- deliver information in easier to understand ways which meet the needs of people with a disability.

302

FINDING 47: Communication of emergency warnings in rural and remote areas can be impeded by digital connectivity issues. Given the growing reliance on digital forms of communication, this is a significant challenge to address to ensure effective communication during natural disasters or other crisis events.

305

FINDING 48: Telecommunications access was an issue and local residents reported delays in restoration of digital connectivity. **305**

RECOMMENDATION 47: Given the essential role of digital connectivity in emergency management and response, that the Victorian Government, working with the Commonwealth Government as necessary, address connectivity limitations, focusing on rural and remote areas. Potential options to consider are the need for:

- enhanced infrastructure investment
- geographically based coverage
- rapid deployment of temporary satellite vans.

305

FINDING 49: Insights from the public response to emergency information during the 2022 flood event indicated a persistent underestimation of risks by the community which delayed some in taking appropriate action, such as evacuating. This inconsistency was exacerbated by unclear or inconsistent warnings and information, heightening confusion in critical moments. **311**

RECOMMENDATION 48: That the Victorian Government establish long-term community awareness initiatives to ensure the public understand flood risk and actions. Successful bushfire awareness campaigns could be used as a basis for such initiatives. **311**

7 Resourcing and response of the Victoria State Emergency Service

FINDING 50: The Victoria State Emergency Service is designated as the lead control agency for flood events under Victoria's *State Emergency Management Plan*. However, the response to events like the 2022 floods is complex and involves coordination across multiple agencies to effectively manage emergency events. **313**

FINDING 51: Notwithstanding annual fluctuations, the Victoria State Emergency Service is responding to an increasing number of events over time. Given the link between climate change and increased extreme weather events, this trend will continue. **316**

FINDING 52: Despite increased funding over time, the Victoria State Emergency Service lacks the appropriate resources to prepare and respond effectively to major emergencies such as flood events. **321**

FINDING 53: Cross training across agencies and other forms of cooperation may be helpful to address capability and capacity issues. **321**

FINDING 54: Concerns were expressed about the Victoria State Emergency Service's ability to attract and adequately train volunteers. **325**

FINDING 55: A productive relationship between the Victoria State Emergency Service and the Victoria SES Volunteers Association, characterised by effective communication and robust mechanisms for addressing concerns, is crucial for maintaining a strong volunteer base, ensuring operational effectiveness, and enhancing volunteer satisfaction and retention. **325**

RECOMMENDATION 49: That the Victorian Government increase funding for training of volunteers to boost the capacity of State Emergency Service units and Shepparton and Echuca and Moama Search and Rescue squads to respond during emergencies. **325**

FINDING 56: For the 2022 flood event, approximately 62.5% of volunteers involved with the Victoria State Emergency Service were involved in flood response activities, coming from 98% of the units across the state. **332**

FINDING 57: In the 2022–23 annual reporting period, flood incidents accounted for over 25% of incidents the Victoria State Emergency Service responded to and accounted for over 34% of response hours. **332**

FINDING 58: The 2022 flood event in Victoria saw a record deployment of 1.5 million sandbags, marking an unprecedented effort to mitigate flood impacts. **339**

FINDING 59: During the 2022 flood event, the Victoria State Emergency Service experienced some challenges in sandbag management and distribution, with local councils noting shortages and coordination issues, affecting timely support in critical areas. **339**

RECOMMENDATION 50: To improve the management and distribution of sandbags during a flood event, that the Victorian Government:

- ensure that there is sufficient supply quantity of sandbags available for preparation for floods in a wet year.
- assess the benefits of a coordinated sandbag management system in Victoria. This system could include capacity for scalable sandbagging stations and address resource gaps in high-risk flood areas.
- ensure that emergency management plans are regularly updated to reflect current resource and logistical capabilities.
- explore options for supplementing reliance on sandbags with innovative new products such as floodgates or water inflated barriers.

339

FINDING 60: The Victoria State Emergency Service demonstrated remarkable commitment and resilience during the 2022 flood event, successfully conducting over 1,500 flood rescues. This considerable effort underscores the dedication of both the staff and volunteers who, despite personal impacts from the flooding, continued to provide crucial support to affected communities.

348

FINDING 61: During the 2022 flood event, the Victoria State Emergency Service faced substantial challenges in conducting rescues, such as:

- insufficient volunteer capacity and inadequate resource availability, particularly in severely affected areas like Rochester
- communication issues impeding the readiness and timeliness of the SES' rescue response.

348

FINDING 62: During the 2022 flood event, there were numerous examples of community-led rescue efforts, where locals used personal resources to rescue neighbours and other community areas. This grassroots response not only highlights community resilience and willingness to assist but also raises concerns about the reliance on informal rescue efforts due to the constraints and limitations faced by official emergency services.

349

RECOMMENDATION 51: That the Victorian Government develop a strategic rescue plan in areas at high risk of flooding, so that they have appropriate resources and expertise for rescues during a crisis event. This plan should include consideration of procurement, expansion of reserve caches and processes for rapid deployment of resources.

349

FINDING 63: There was inconsistency in evacuation preparedness across communities affected by the 2022 flood event, which compromised response effectiveness. It is crucial to ensure individuals and businesses are being encouraged to develop robust evacuation plans, and that the Victoria State Emergency Service issues timely, accurate and informative evacuation warnings. **353**

RECOMMENDATION 52: That the Victorian Government, in collaboration with the Victoria State Emergency Service, review its approach to evacuation warnings to identify opportunities for improvement and increased community responsiveness. **353**

FINDING 64: On 14 October 2022, residents of Maribyrnong in the evacuation zone had approximately 8 hours to evacuate from when the evacuation process was underway to the Maribyrnong River reaching its peak flooding height. **354**

FINDING 65: The evacuation of Maribyrnong residents on 14 October 2022 was challenging because of rapid flooding that strained early morning evacuation efforts and inconsistent flood warning advice the previous evening. Nonetheless, the Victoria State Emergency Service adapted, intensifying their response as the situation escalated. **357**

FINDING 66: Maribyrnong residents affected by the evacuation reported significant trauma associated with the process, further exacerbated by the overall impact of the major flooding event. The timing of the evacuation warnings led to some residents receiving insufficient notice, leaving them unprepared to evacuate promptly. **357**

FINDING 67: Despite structured coordination efforts between the Victoria and New South Wales State Emergency Services, including daily teleconferences and shared resources, there remains a significant need for formalisation of these arrangements. **360**

RECOMMENDATION 53: That the Victorian Government and the Victoria State Emergency Service work with:

- a. New South Wales to finalise the MOU that has been initiated, and to make it publicly available
- b. South Australian counterparts to initiate and establish a MOU or other mechanisms for cross-border cooperation in relation to shared emergency events, and to make this publicly available. **361**

FINDING 68: The Victoria State Emergency Service was a pivotal part of the emergency response to the 2022 flood event. The exceptional dedication and resilience of the staff and volunteers in supporting communities and mitigating risks to life and property is commendable.

363

FINDING 69: The Victoria State Emergency Service is the appropriate control agency for flood emergencies, however strategic improvements are necessary in communication, resource allocation, and volunteer support to enhance its overall effectiveness and sustainability in managing such crises.

364

RECOMMENDATION 54: That the Victoria State Emergency Service undertake a strategic review of its resources, leadership and personnel allocation. This review should focus on enhancing communication systems, ensuring adequate availability of essential resources like rescue equipment, and implementing robust volunteer recruitment processes, support and training programs.

364

RECOMMENDATION 55: That the Victorian Government increase funding and support for the Victoria State Emergency Service to enable a comprehensive upgrade of emergency communication technologies, ensure a steady supply of critical response resources, and expand volunteer recruitment and retention programs, thereby bolstering the agency's capability to manage and respond to emergencies effectively.

364

RECOMMENDATION 56: That the Victorian Government ensure that incident control centres include a mechanism for local expertise to be included in their operations and help inform processes to assist managing localised warnings and response.

364

FINDING 70: Both volunteer brigades and career firefighters played a crucial role in response efforts during the 2022 flood event, demonstrating their capability and commitment under challenging circumstances. However, the recurring issues of available resources and personnel fatigue highlights a significant area for improvement in emergency response management, infrastructure and support.

371

FINDING 71: Shepparton Search and Rescue demonstrated significant operational effectiveness during the 2022 floods, despite operating under resource constraints. These challenges underscore the need for enhanced structural and resource-based support for independent emergency services to ensure optimal response capabilities in future emergencies.

373

RECOMMENDATION 57: That the Victorian Government increase funding to Shepparton and Echuca and Moama Search and Rescue squads to ensure optimal response capabilities in future emergencies. **374**

FINDING 72: The scale of Victoria’s flood event in 2022 meant the activation of Australian Defence Force resources was necessary to assist ongoing response efforts from state-based emergency services. **376**

FINDING 73: The Committee heard that many Rochester community members were devastated when they observed the Australian Defence Force passed them by on route to other flood-affected towns. **376**

FINDING 74: The timing of the activation of the Australian Defence Force to some flood-affected communities caused community concern about disaster response efforts. However, the emergency response to events such as floods should be led and coordinated at the state level and not be reliant on Australian Defence Force support. **377**

8 Flood recovery

FINDING 75: In many communities, including Rochester, support in the days directly after peak floods was from local first responders, community and spontaneous volunteers. **386**

FINDING 76: During major flood events or crises, Emergency Relief Centres operated by local councils are crucial for providing residents with immediate support in a safe environment. **386**

FINDING 77: During the 2022 flood event, some Emergency Relief Centres activated by local councils experienced some challenges in readiness and efficiency. **386**

RECOMMENDATION 58: That the Victorian Government, working with local councils, establish statewide operating guidelines for Emergency Relief Centres. These guidelines should include protocols on rapid activation, streamlined communication and resource mobilisation. Local councils should remain empowered to tailor protocols to meet local needs. **386**

RECOMMENDATION 59: In line with Recommendation 58, that the Victorian Government, working with local councils, investigate options for emergency funding arrangements to assist operating Emergency Relief Centres and include these arrangements in statewide operating guidelines. **386**

FINDING 78: Recovery hubs play a crucial role in supporting communities long after the immediate aftermath of a disaster, providing a central point for longer-term assistance and services. **388**

FINDING 79: The absence of computers and internet access impeded members of the community from applying for individual relief grants. **388**

RECOMMENDATION 60: That the Victorian Government plan and resource recovery hubs (including online access) sufficiently to fulfil their role in long-term community recovery and resilience building. **388**

FINDING 80: The complexity of processes associated with flood recovery financial supports exacerbated the distress of some flood-impacted individuals, families and businesses. Some communities experienced delays to immediate relief and some were potentially deterred from claiming assistance which would have facilitated recovery. **396**

FINDING 81: Despite the availability of a wide range of grants and financial support programs, it is challenging to effectively align support that is broadly available with the different needs of affected individuals. **396**

RECOMMENDATION 61: That the Victorian Government simplify the application process for disaster recovery funding. This could include reducing paperwork, providing hands-on assistance and investigating technology to streamline processes. **396**

RECOMMENDATION 62: That the Victorian Government evaluate the criteria and funding arrangements for financial assistance post-disaster with a view to:

- a. better aligning support with costs of recovery
- b. proposing options for quickly deploying support mechanisms according to the scale and complexity of the event.

396

FINDING 82: In Northern Victoria, the broader issues of housing availability, affordability and suitability in the region created additional issues for housing flood-affected people. These issues underscore a systemic challenge extending beyond the immediate emergency response. 405

FINDING 83: In Maribyrnong, ongoing housing challenges following the 2022 flood event include long-term displacement of residents, with many still in temporary accommodation or living in partially restored homes. 405

RECOMMENDATION 63: That the Victorian Government review its framework for providing housing support following an environmental disaster. In particular, the Government should assess the application system to ensure that genuinely affected households are provided support in a timelier manner and to mitigate the risk of fraudulent claims. 405

RECOMMENDATION 64: That the Victorian Government recognise caravan parks as essential businesses in disaster-prone areas as providers of housing and emergency support and ensure support is available (including grants) under Disaster Recovery Funding Arrangements to caravan park operators, including those operating on Crown Land. 405

FINDING 84: In Northern Victoria, the October 2022 flood event has seen the prolonged submersion of land and infrastructure resulting in extensive damage and erosion. The damage of the floods has been widespread including the tragic loss of life, displacement of residents and damage to thousands of homes and businesses. 412

FINDING 85: The flooding in Maribyrnong exceeded initial damage projections, affecting over 500 residences and necessitating extensive clean-up efforts, significantly impacting local infrastructure and community facilities. 412

RECOMMENDATION 65: That the Victorian Government, noting that repair of natural environment is often overlooked in disaster recovery, assess and make funding available for natural environment and restoration. 412

RECOMMENDATION 66: To assist with ongoing clean-up of flood-affected areas following disasters, that the Victorian Government establish a dedicated financial support program for local businesses involved in debris removal and restoration efforts. This should include reimbursement mechanisms for businesses, such as earthmoving companies, that contributed equipment and personnel to the clean-up but suffered significant financial losses doing so. 412

RECOMMENDATION 67: That the Victorian Government pay its bills on time, especially following natural disasters. **412**

RECOMMENDATION 68: That the Victorian Government work to support better collaboration between local communities, contractors, and government agencies, ensuring swift deployment of additional human resources for efficient post-disaster clean-up efforts. **412**

RECOMMENDATION 69: That the Victorian Government collaborate with local authorities and community groups to develop and implement a debris management strategy and ensure that it aligns with broader disaster management plans as part of future-proofing for environmental events. **412**

FINDING 86: There is a pressing demand for comprehensive community support, including practical measures, and a critical necessity for increasing support mechanisms addressing emotional and mental impacts for an effective emergency response. **416**

RECOMMENDATION 70: That the Victorian Government develop community-based initiatives and resource-sharing mechanisms, fostering resilience and solidarity among towns facing challenges from environmental disasters. These should ensure timely and effective responses to future crises, leveraging collective strength and kindness to aid in the recovery process. **416**

FINDING 87: The 2022 flood event caused significant and enduring trauma to many of those affected, manifesting in mental health challenges that require comprehensive support and intervention. **424**

RECOMMENDATION 71: That the Victorian Government provide long-term funding contracts for mental health services in flood-affected regions, with a focus to securing dedicated mental health professionals and effective service delivery in communities impacted by natural disasters. **424**

FINDING 88: By September 2023, there were over 10,000 insurance claims from the 2022 flood event, totalling \$489 million; 87% of all claims have been closed, with a lower closure rate for residential and commercial property claims. **428**

FINDING 89: Timely insurance processing is crucial for easing financial strain and expediting post-disaster rebuilding. Delays or inadequate coverage prolong hardships, hindering recovery for individuals and communities.

431

FINDING 90: The significant challenges faced by insurers and policyholders during the 2022 flood event underscore the urgent need for enhanced national coordination and reform in disaster insurance practices.

437

RECOMMENDATION 72: That following the outcomes of the House of Representatives' *Inquiry into insurers' responses to 2022 major floods claims*, the Victorian Government advocate to the Commonwealth Government that it take action to ensure that residents and businesses in flood-affected areas can obtain and maintain necessary insurance.

438

RECOMMENDATION 73: That the Victorian Government's response to this Inquiry identifies the responsible authorities for each recommendation and provides a timeframe for action and reports back to Parliament on progress made implementing the recommendations.

438

What happens next?

There are several stages to a parliamentary inquiry.

The Committee conducts the inquiry

This Final Report on the Inquiry into the 2022 flood event in Victoria is the result of extensive research and consultation by the Legislative Council Environment and Planning Committee.

The Committee received written submissions, spoke with people at public hearings, attended site visits, reviewed research evidence and deliberated over a number of meetings. Experts, government representatives and individuals expressed their views directly to us as Members of Parliament.

A parliamentary committee is not part of the Government. The Committee is a group of members of different political parties (including independent members). Parliament has asked us to look closely at an issue and report back. This process helps Parliament do its work by encouraging public debate and involvement in issues.

You can learn more about the Committee's work at: <https://www.parliament.vic.gov.au/epc-lc>.

The report is presented to Parliament

This report was presented to Parliament and can be found at: <https://www.parliament.vic.gov.au/get-involved/inquiries/floodinquiry/reports>.

A response from the Government

The Government has six months to respond in writing to any recommendations made in this report.

The response is public and put on the inquiry page on Parliament's website when it is received at: <https://www.parliament.vic.gov.au/get-involved/inquiries/floodinquiry/reports>.

In its response, the Government indicates whether it supports the Committee's recommendations. It can also outline actions it may take.

Chapter 1

About the Inquiry

1.1 The Inquiry

The Legislative Council Environment and Planning Committee received its first inquiry for the 60th Parliament on 22 February 2023.

The Committee investigated Victoria's preparedness for, and response to, Victoria's major flooding event of October 2022. In particular, the Committee considered factors such as what caused and contributed to the flood event, emergency services, government policy, flood mitigation strategies, and the Victorian planning framework.

On 18 April 2024, the Committee tabled its Interim Report at the Legislative Council regional sitting in Echuca. The Interim Report was focused on the recovery needs of Northern Victoria. This Final Report considers all areas impacted by flooding and examines the 2022 flood event in more detail.



Committee Chair Ryan Batchelor discussing the Interim Report for the Inquiry into the 2022 flood event in Northern Victoria

This Chapter examines the important contributions of the Maribyrnong and Northern Victorian communities affected by flooding to the Inquiry and to the work of the Committee.

The Inquiry opened to public submissions on 6 March 2023. The original date to provide submissions by May 2023 was extended several times to accommodate flood-affected communities and residents. The last public submission was accepted on 31 January 2024. A total of 880 submissions were received.

Throughout the course of the Inquiry, the Committee held 13 days of public hearings, comprising 57 sessions and 183 witnesses. Witnesses ranged from representatives from the Victorian Government and emergency services to people directly affected by the flooding. Several site visits were also conducted in Northern Victoria and Maribyrnong.

The contribution of communities in Maribyrnong and Northern Victoria is discussed more in the Sections below.

1.2 The October 2022 flood event in Maribyrnong

1.2.1 Public submission phase

Of the 880 submissions made to the Inquiry, around 87 came from areas affected by flooding of the Maribyrnong River in October 2022. The tables below outline the main contributing areas.

Table 1.1 Submissions from stakeholders impacted by the Maribyrnong floods

| Electoral district | Number of submissions |
|--------------------|-----------------------|
| Essendon | 50 |
| Melbourne | 15 |
| Niddrie | 10 |
| Laverton | 3 |
| Sunbury | 2 |
| Warrandyte | 2 |
| Ivanhoe | 1 |
| Bundoora | 1 |
| St Albans | 2 |
| Point Cook | 1 |

Source: Legislative Council Environment and Planning Committee.

1.2.2 Public submission writing workshop: Maidstone (3 May 2023)

The Committee Secretariat held the first of three public submission writing workshops at the Medway Golf Club in Maidstone on the evening of 3 May 2023. See Section 1.3 on engagement from the Northern Victorian community for details on the other submission writing workshops.

The Committee resolved very early in the Inquiry that people affected by the floods be at the forefront of the Inquiry's investigations.

Holding targeted submission writing workshops is not a customary practice of committee inquiries. The workshops were held to allow people to gain a practical insight into the process of a parliamentary inquiry. Attendees were given an overview of the Inquiry, including the terms of reference, and were provided practical tips and advice on how to make a submission, including how to present evidence and arguments in a clear and persuasive way. Hard copy submission forms that could be posted back to the Committee were provided. Assistance with lodging an online submission was also offered, with committee staff on hand to answer questions and address any concerns about the process.



Clockwise from top left: Inquiry Officer Kieran Crowe briefs residents about the inquiry process at a submission writing workshop in Maidstone; Committee Manager Lilian Topic listens to local residents at the Maidstone submission writing workshop; residents ask questions of committee staff at the submission writing workshop in Maidstone; residents affected by flooding of the Maribyrnong River attend a submission writing workshop in Maidstone.

1.2.3 Public hearings

After launching the public hearing phase of the Inquiry in Northern Victoria in August 2023 (see Section 1.3.3), the Committee conducted further public hearings throughout October, November and December 2023, and May 2024.

More than 180 witnesses, presenting as individuals or on behalf of organisations, appeared across the 13 days of public hearings held for this Inquiry.

The Committee heard from multiple municipal councils, water authorities, government departments, the Victoria Racing Club, flood recovery committees, insurance associations, the Bureau of Meteorology, volunteering organisations and many others.

Minister for Water Harriet Shing and Minister for Emergency Services Jaclyn Symes appeared at separate hearing sessions held on 6 December 2023. Melbourne Water was recalled to appear on 10 May 2024, after an initial appearance on 11 October 2023.



Clockwise from top left: Committee Members Wendy Lovell, Ryan Batchelor, David Ettershank, Melina Bath and Gaelle Broad listen to evidence at one of the 13 days of public hearings; media organisations attended many of the hearings, including this council panel session involving City of Melbourne, Moonee Valley City Council and Maribyrnong City Council; Melbourne Water Independent Review Panel Chair G Tony Pagone AM KC reappeared at the Inquiry with Tim Peggie and Mark Babister in May 2024; Melbourne Water Managing Director Nerina Di Lorenzo reappeared alongside Craig Dixon and Tim Wood after the release of new flood modelling for the Maribyrnong River catchment.

1.2.4 Site visits

On 10 October 2023, the Committee undertook two site visits in the Maribyrnong area.

They met with the Victoria Racing Club who showed them the Flemington Racecourse flood wall.

They also toured the Rivervue Retirement Village at Avondale Heights where they met with management and residents to discuss the impact of the Maribyrnong River flood.



Clockwise from top left: Kay Barlow, Tony Goddard, Sue Ryan and Vula Kerr shared their experiences of the Maribyrnong River flood with Members of the Committee during a site visit; John Berger, Gaelle Broad, David Ettershank and Samantha Ratnam were among Members of the Committee who toured the flood-affected Rivervue Retirement Village in Avondale Heights; Committee Members Gaelle Broad, David Ettershank, Sheena Watt, Wendy Lovell, John Berger, Rikkie-Lee Tyrrell and Samantha Ratnam with Victoria Racing Club CEO Steve Rosich; Rivervue Retirement Village's Darren Lewis explains the impact of Maribyrnong River flooding to Committee Members including Samantha Ratnam, David Ettershank, Wendy Lovell and Gaelle Broad.

1.2.5 Online open mic session

On 18 October 2023, the Committee hosted an online open mic session for flood-affected individuals who might not have already had a chance to share their stories by making a public submission. Nineteen people from across Victoria took part, including five who were impacted by the Maribyrnong River flood in October 2022.



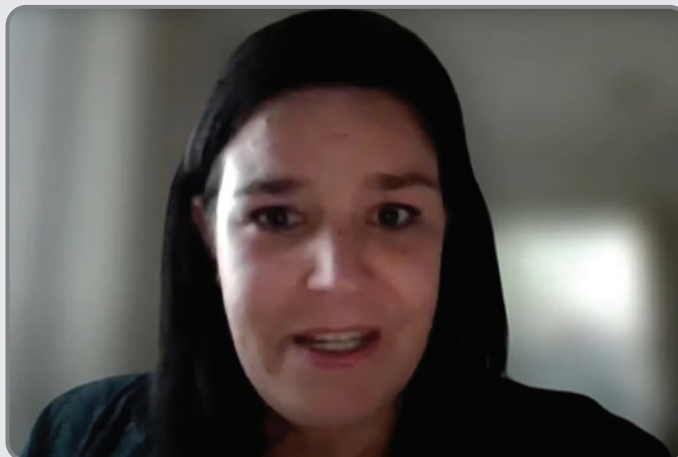
“The community has really banded together to be able to write something and to be heard.”

Linh Nguyen,
Maribyrnong



“It’s really important that people make submissions because without those personal stories and the lived experience of people who can make submissions how will government or policy makers really understand what’s required to make the improvements so we can do it better next time.”

Faye Bendrups,
Maribyrnong



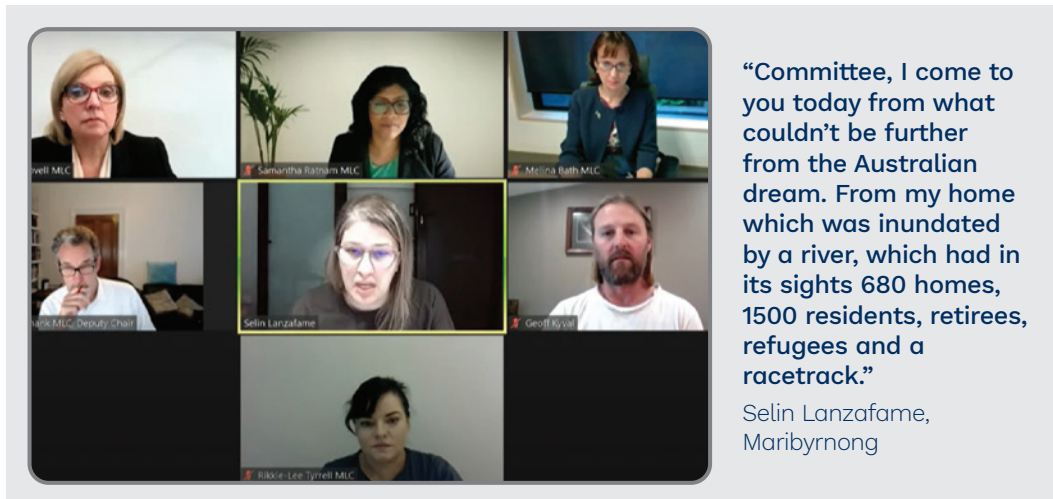
“I think there are lessons to be learned here and as hard as it is for organisations involved to hear those lessons and potentially their failures, they need to hear them, they need to learn from them.”

Sarah Marshall,
Maribyrnong



“At our village 47 homes were flooded with residents needing to find and fund alternate housing for seven months while a rebuild took place.”

Tony Goddard,
Avondale Heights



“Committee, I come to you today from what couldn’t be further from the Australian dream. From my home which was inundated by a river, which had in its sights 680 homes, 1500 residents, retirees, refugees and a racetrack.”

Selin Lanzafame,
Maribyrong

1.3 The October 2022 flood event in Northern Victoria

1.3.1 Public submission phase

As noted, a total of 880 submissions were received for this Inquiry. Approximately 608 of these were from Northern Victoria. The main contributing towns and local government areas are listed below.

Table 1.2 Submissions from towns in Northern Victoria

| Town | Number of submissions |
|-----------|-----------------------|
| Rochester | 344 |
| Echuca | 58 |
| Bendigo | 19 |
| Seymour | 16 |
| Kerang | 15 |

Source: Legislative Council Environment and Planning Committee.

Table 1.3 Submissions from flood-affected local government areas in Northern Victoria

| Local government area | Number of submissions |
|-----------------------|-----------------------|
| Campaspe | 429 |
| Murrindindi | 36 |
| Greater Shepparton | 27 |
| Gannawarra | 25 |
| Loddon | 22 |
| Greater Bendigo | 18 |

Source: Legislative Council Environment and Planning Committee.



Inquiry Officer Kieran Crowe briefs residents at the Rochester submission writing workshop.



The Seymour submission writing workshop.



“We haven’t really spoken to any other people that have been impacted by the flood until tonight.”

Stuart Hanley, Seymour

1.3.2 Public submission writing workshops

On 23 April 2023, the Mayor of Campaspe Shire, Cr Rob Amos, wrote to the Committee, requesting support for Campaspe Shire residents to complete public submissions to the Inquiry. Residents of the Shire had faced flooding from the Murray, Goulburn, and Campaspe Rivers. Councillor Amos told the Committee that at that time 50% of residents were able to return to their homes. However, others were living in caravans on their properties or at camping grounds, in temporary accommodation at Elmore, or had not returned to the region at all. It was the Mayor’s view that many residents did not have the technology they would usually rely on to complete an online submission.

A request for support from Mitchell Shire Council followed soon after.

After commencing public submission writing workshops in Maidstone on 3 May 2023, the Committee Secretariat conducted further workshops in Seymour (7 June 2023) and Rochester (14 June 2023).

Our children are the future of Rochester and rebuilding not only involves physical structures but also the social fabric of our community.

Elizabeth Trewick, Principal, St Joseph’s School and Rochester Community Recovery Committee, public hearing, Rochester, *Transcript of evidence*, p. 4.



Clockwise from top left: Rikkie-Lee Tyrrell, Wendy Lovell, Gaelle Broad, Sonja Terpstra, Samantha Ratnam and Melina Bath at the Seymour public hearing; beef farmer Andrew Perry gives evidence at the Seymour public hearing. Nick Stecher is on the left; a panel of Victorian councils gave evidence at the Echuca public hearing.



Committee Members hear from Rochester and Elmore District Health Service (REDHS) at the Rochester Shire Hall.



Representatives from the Committee for Greater Shepparton, the Greater Shepparton Lighthouse Foundation, Murray Dairy and Valley Pack appeared as part of a panel at the Mooroopna public hearing.

1.3.3 Public hearings and site visit

The Committee launched the public hearing phase of the Inquiry in Rochester on 23 August 2023. Over 100 people attended the public gallery as local and district residents gave candid and impassioned evidence. Further day-long public hearings were held at Echuca (24 August), Mooroopna (13 September) and Seymour (14 September). In Echuca, Members of the Committee undertook a site visit and inspected the Echuca flood levee.

Hearings in each of these towns were supported by the local councils and communities who assisted with set-up and organisation of venues and provided advice to committee staff prior to the hearings.



Left to right: Committee Members tour the Echuca flood levee; Mark Cattell, ACO Readiness, Victoria State Emergency Service, took Committee Members on a tour of the Echuca flood levee.

1.3.4 Open mic sessions

Two open mic sessions were held during the public hearing phase of the Inquiry, including an in-person session at Rochester where 16 local and district residents shared what they had experienced before, during and following the October 2022 flood event. A further 19 people from across Victoria recounted their lived experiences and shared their views at an online session held on 18 October 2023. On both occasions, the Committee heard heartfelt evidence about the impact of the floods on lives and livelihoods.



More than 100 people attended the Rochester Shire Hall for a public hearing and open mic session.



Clockwise from top left: Catriona Jenkins at the Rochester open mic session; John Oakley recounts his flood experience at the Rochester open mic session; Gaelle Broad, Wendy Lovell, John Berger, Sonja Terpstra and Melina Bath hear from witnesses at Rochester.



“Look, something definitely needs to be done, some accountability and some care perhaps for those of us that live downstream and a bit of courtesy. But thank you so much for giving us the opportunity to speak.”

Naomi Clark, Bunbartha



“We have to invest in community leaders and we have to provide that support for them to educate their communities.”

Sam Atukorala,
Shepparton



“These disasters are not going to stop and the way to do better is to ensure we deliver inclusive planning, robust frameworks and proper resourcing of local government and state emergency services.”

Leah Taaffe, Echuca



“I personally view this inquiry as the only viable expression to date to communicate our experience in the hope that it aids our community.”

Cameron David Lovering,
Rochester



“Our children are the future of Rochester and rebuilding not only involves physical structures but also the social fabric of our community.”

Elizabeth Trewick,
Rochester



“So, the challenge I pose to all levels of government in this post-flood, post-pandemic environment is to strategically rebuild trust, credibility and capacity and lead well under pressure.”

Kate Burke, Echuca



“There is still so much pain in our community today. We struggle for data; we struggle for agencies to share information and we will continue to struggle for a long time to recover.”

Leigh Wilson, Rochester



“There needs to be some recalibration of response agencies in their established doctrines and ethos to ensure that we are all working as one agency.”

Ann-Marie Roberts,
City of Greater Bendigo

1.4 Online and social media engagement

The Committee used connections with local councils and community members, as well as social media to reach as many communities and individuals as possible throughout each phase of the Inquiry.

Information about Committee activities was provided via:

- media releases
- news articles on the Parliament of Victoria website
- videos
- social media posts
- advertising through *The Age* newspaper.

This included information about submission timeframes, hearing schedules and other Inquiry updates.

There was also extensive interest and coverage provided by external media organisations.

Comments to social media were gathered to inform the Committee Secretariat and internally produced videos have received thousands of views on YouTube.

Local community members were willing to appear on camera and share their stories.



Committee Chair Ryan Batchelor gives an update on the Inquiry via Parliament's social media.

The Legislative Council Environment and Planning Committee thanks everyone who provided a submission, appeared at a hearing or participated in workshops for their engagement with the Inquiry.

Full coverage of the Inquiry can be found at these locations:

Videos: <https://vicparl.news/floodinquiryvids>

Media releases: <https://www.parliament.vic.gov.au/floodinquiry>

Facebook posts: <https://www.facebook.com/VicParliament>

Instagram posts: <https://www.instagram.com/victorianparliament>.

**Adopted by the Legislative Council Environment and Planning Committee
Parliament of Victoria, East Melbourne
21 June 2024**

