State Emergency Management Plan, Earthquake Sub-Plan 2023

Edition 2.0

SES

VICTORIA
State Government

Acknowledgment of Traditional Owners

The Victoria State Emergency Service respectfully acknowledges the Traditional Owners of the land and waters. We pay our respects to Elders past, present and emerging, and are committed to working with Aboriginal and Torres Strait Islander communities to achieve a shared vision of safer and more resilient communities.

Authority

This plan has been endorsed by the State Crisis and Resilience Council (SCRC) as a sub-plan to the State Emergency Management Plan.

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Executive summary

This **State Emergency Management Plan (SEMP) – Earthquake Sub-Plan Edition 2** (this plan), replaces the **State Earthquake Sub-Plan V 1.1** published in February 2023 as an 'urgent update', ensuring that in the event of any potential earthquakes the most current plan reflected current operational practices, allowing time to complete a full review with formal consultation.

This Edition has built on that urgent update which recognised the need to:

- Commence the development and implementation of standard operating procedures in relation to activation triggers for earthquakes in Victoria.
- Update public information and warnings and public publishing business rules to reflect these triggers.
- Update public websites on community information relating to earthquakes reflected in the 2016 State Earthquake Sub-Plan.
- Ensure the plan reflects current legislation.

Permission for publication was granted by the Emergency Management Commissioner (EMC) as per the SEMP Guidelines, noting that consultation and further review of this plan commenced after the publication of this plan.

The plan included provision of current and accurate information relating to:

- Any VICSES changes in organisation, agency roles and responsibilities.
- Operational response in a complex and multi-hazard environment that has impacted Victoria since the previous version published in 2016.
- Alignment with arrangements contained in the SEMP approved in October 2021 and subsequent Machinery of Government changes that took effect on 1 January 2023

This **State Emergency Management Plan (SEMP) – Earthquake Sub-Plan Edition 2** (this plan), replaces the **State Earthquake Sub-Plan V 1.1** and was prepared with regard to the SEMP, and the **Guidelines for Preparing State, Regional and Municipal Emergency Management Plans (SEMP Guidelines)**, including formal consultation and statement of assurance.

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1. Introduction

1.1 Purpose

This plan outlines the Victorian arrangements for managing earthquake events across all emergency management phases and replaces the State Earthquake Sub-Plan V 1.1 published in February 2023.

The plans' purpose is to provide sources of information and to outline the arrangements for ensuring an integrated and coordinated approach to the state's management of earthquake events, and to reduce the impact and consequences of these events on the community, infrastructure, and services.

1.2 Objective

Victoria's state-level emergency risk assessment, Emergency Risks in Victoria, was published in 2020 and sets out Victoria's emergency risk profile. Earthquakes were assessed as a state significant risk, meaning significant earthquakes were assessed as being a critical and credible scenario for the state.

In alignment with the SEMP, this plan contextualises the current arrangements, roles and responsibilities for earthquake mitigation, preparedness, response (including relief) and recovery.

VICSES, on behalf of the Emergency Management Commissioner (EMC), coordinated the development of this plan in conjunction with primary (direct) stakeholders including, but not limited to:

- Ambulance Victoria (AV)
- Australian Red Cross
- Bureau of Meteorology (BOM)
- Country Fire Authority (CFA)
- Department of Education (DE)
- Department of Energy, Environment and Climate Action (DEECA)
- Department of Health (DH)
- Department of Families, Fairness and Housing (DFFH)
- Department of Government Services (DGS), including Local Government Victoria
- Department of Jobs, Skills, Industry and Regions (DJSIR)
- Department of Transport and Planning (DTP)
- Emergency Recovery Victoria (ERV)
- Environment Protection Authority (EPA)
- Fire Rescue Victoria (FRV)
- Geoscience Australia (GA)
- Joint Australian Tsunami Warning Centre (JATWC)
- Municipal Association of Victoria
- Victoria Police

The following secondary (indirect) stakeholders have been identified as important stakeholders in future planning, exercising and engagement:

- Department of Home Affairs (COMDISPLAN 2020)
- Life Saving Victoria (LSV)
- National Emergency Management Agency (NEMA)
- National Coordination Mechanism (NCM)
- Victorian Aboriginal Heritage Council
- WorkSafe Victoria

1.3 Scope

This plan acknowledges the often-concurrent emerging threats and their consequences of earthquakes, including landslides, water surges and tsunami, as well as the structural integrity of critical infrastructure, including water storages and water supply, wastewater services, gas and electricity, transport, health and telecommunication service disruptions.

The scope of this plan includes:

- The description of potential risks and consequences of earthquakes to the social, built, economic, and natural environments.
- The policy and programs in place to mitigate these risks before, during, and after an earthquake event.
- The positions with accountability and the agencies responsible for managing specific strategies.
- The multi-agency management arrangements at the national, state, regional and local levels.
- Links to sources of information where the reader can obtain further detail.

References are made to the SEMP where necessary to avoid duplication. It does not include detail about the operational activities of individual agencies.

1.4 Authorising environment

In 2018, amendments to the *Emergency Management Act 2013 (EM Act)* were passed through parliament, requiring the EMC to arrange for the preparation of a SEMP. The SEMP allows for an integrated, coordinated, and comprehensive approach to emergency management at the state level. It contains provisions for the mitigation of, response (including relief) to, and recovery from emergencies (before, during and after), and specifies the roles and responsibilities of agencies in relation to emergency management.

Under the *EM Act*, earthquakes (or other natural events), are a Class 1 Emergency. A Class 1 Emergency is a major fire or any other major emergency where either the CFA, FRV or VICSES is the control agency.

The *EM Act* defines a major emergency as an event which:

- Is a large or complex emergency (however caused), which –
  - (i) Has potential to cause or is causing loss of life and extensive damage to property, infrastructure, or the environment; or
  - (ii) Has the potential to have, or is having significant adverse consequences for the Victorian community or a part of the Victorian community; or
  - (iii) Requires the involvement of two or more agencies to respond to the emergency; or
    - Is a Class 1 Emergency.
    - Is a Class 2 Emergency.

This plan aligns with the SEMP and was prepared with regard to the *Guidelines for Preparing State, Regional and Municipal Emergency Management Plans;* and was endorsed by the State Crisis and Resilience Council (SCRC) in April 2022.

This plan was published and took effect 12 May 2022.

The following legislation, while not exhaustive, is the principal legislation for earthquakes in Victoria:

- *Emergency Management Acts 1986 and 2013 (EM Act).*
- *Victoria State Emergency Service Act 2005.*
- *Essential Services Act 1958.*
- *Planning and Environment Act 1989.*
- *Aboriginal Heritage Act 2006.*
- *Building Act 1993*
- *Building Regulations 2018*

1.5 Activation of the plan

The arrangements in this plan apply on a continuing basis and do not require activation.

1.6 Audience

This plan recognises that for emergency management and supporting communities to be safer and more resilient it is the shared responsibility of all Victorians, not just the emergency management sector.

The audience for this plan comprises the Victorian Government and agencies within the emergency management sector, including business, industry and community groups with a significant role in the mitigation of, response to, and recovery from earthquakes.

1.7 Exercise and evaluation

This plan will be exercised within one year from the date of approval. The exercise will be evaluated and, where improvements to the emergency management arrangements in this plan are required, the plan will be amended, and a revised version issued.

Exercises will be conducted in accordance with the Australian Institute for Disaster Resilience (AIDR) Managing Exercises Handbook, available at via the AIDR website here.

1.8 Review

This plan will then be reviewed and updated at least every three years, with consideration given to earlier revisions as required to ensure the plan provides for a current, integrated, coordinated, and comprehensive approach to earthquake emergencies, and consideration of potential escalation of climate-related hazards.

Earlier reviews may be triggered by this plan being applied in a major emergency or exercise, or following a substantial change to relevant legislation or arrangements, including the SEMP.

1.9 How to read this plan

This plan should be read in conjunction with the SEMP.

Linkages and hyperlinks

This plan refers to a range of existing resources relating to earthquakes, including documents and websites. This plan does not seek to duplicate the information contained in these resources, and instead provides links to where the reader can obtain further information.

For more operational or sensitive information a log-in may be required, such as for documents saved on the Emergency Management Common Operating Picture (EM-COP), including Joint Standard Operating Procedures (JSOPs).

Documents or resources that are referred to frequently throughout this plan (such as the SEMP) are not hyperlinked in each instance.

All hyperlinks were accurate at time of publication, and the currency of the linked content remains the responsibility of the host agency.

Consequence management

Secondary consequences for earthquake can be complex and compounding. The arrangements for managing consequences of earthquake are contained in relevant SEMP Sub-Plans, including, but not limited to:

- SEMP Tsunami Sub-Plan; of particular note:
  - The Joint Australian Tsunami Warning Centre will issue a National No Tsunami Bulletin following a widely felt earthquake by Victorian or other Australian coastal communities.
  - The purpose of the No Tsunami Threat advice is to alleviate coastal communities' concern of potential tsunami, even if the earthquake magnitude is small and the epicentre is on land (i.e., not possible to cause tsunami).
- SEMP Health Emergencies Sub-Plan
- SEMP Energy Sub-Plan
- SEMP Public Transport Disruption Sub-Plan
- SEMP Landslide Sub-Plan
- SEMP Maritime Emergencies (non-search and rescue) Sub-Plan
- Roles and responsibilities outlined within the SEMP

Where necessary, VICSES has prepared **Regional Earthquake Sub-Plans**, and **Municipal Earthquake Sub-plans.**

Regional and Municipal Earthquake Emergency Plans can be found via the VICSES website.

In the case of a concurrent emergency (e.g. Human Pandemic or an energy disruption), the arrangements detailed in this plan may need to be adjusted as required.

2. The emergency context

2.1 Risks

2.1.1 What is an earthquake?

An earthquake is the shaking and vibration at the surface of the Earth, caused by energy being released along a fault plane at the edge of a tectonic plate or by volcanic activity.

2.1.2 What causes earthquakes?

Earthquakes are caused by the movement of the Earth's outer layer (the crust and a portion of the upper mantle). The outside layer of the Earth is split into tectonic plates, which are moving slightly due to the movement of magma in the layer below. This causes plates to squeeze together, move apart, and slide alongside each other.

Earthquakes in Australia are classified as intraplate earthquakes, as they occur within the interior of tectonic plates away from plate boundaries. Intraplate earthquakes are generally less common and not as large as those on plate edges. Australia is located within the Australian plate, where tectonic processes at the edge of this plate interact with the Indian, Eurasian, and Pacific tectonic plates, and generate compressive stresses in Australia's interior, meaning rocks push or squeeze against one another. Australia's earthquakes are caused by sudden release of this stress when rocks deep underground break and move along a fault line. Victorian fault line information can be found at GA – Neotectonics Layer

Victoria regularly experiences small earthquakes that are felt and reported, and on occasions has experienced moderate sized earthquakes that have caused minor damage, community concern, and short-term disruption. These develop due to stresses and strains in the Indo-Australian plate (of which Australia is a part) as it drifts northward; as sediment loads continually transfer from upper catchment areas to lower basins and coastal areas due to erosion; and as fluctuating sea levels load and unload the continental shelf.

Earthquakes have the potential to cause catastrophic impacts and consequences for communities. Although Australia is popularly considered to have a low earthquake risk, a major earthquake could still occur under a heavily developed and populated area in Victoria. The impact of such an earthquake could have widespread consequences throughout developed and populated cities and towns and could felt across jurisdictional boundaries and earthquakes in other states/territories may be direct or indirect impacts in Victoria.

2.1.3 Earthquake magnitude

The size of an earthquake is referred to as its magnitude. For every unit increase in magnitude, there is roughly a thirty-fold increase in the energy released. For instance, a magnitude 2.0 earthquake (M2.0) releases about 30 times more energy than a magnitude 1.0 earthquake (M1.0), while a magnitude 3.0 earthquake (M3.0) releases 900 times (30x30) more energy than a magnitude 1.0 (M1.0).

Each year, Australia records on average 100 magnitude 3 or higher earthquakes. Above magnitude 5.0 earthquakes occur on average every one to two years, and a magnitude 6.0 or more may be experienced roughly every 10 years. The probable maximum earthquake magnitude for Australia is approximately M7.5.

Australia is not immune from damaging earthquakes causing significant human and economic loss.

The most recent significant events are summarised in Appendix 1 – History of damaging earthquakes in Victoria within the last 40 years.

2.2 Impacts and consequences

Earthquakes with magnitudes of less than 3.5 seldom cause damage in Australia. However, magnitude 4.0 earthquakes may on occasion topple chimneys or cause other damage to older building infrastructure (e.g., building facades and awnings) that could result in injuries or fatalities. Earthquakes greater than magnitude 5.0 may cause minor damage/cracks within some dams, water storages, waste infrastructure, including landfills and/or other critical infrastructure. The scale and effects of an earthquake depend on many factors, including:

- Earthquake magnitude
- Depth
- Distance from the epicentre
- Topography
- Local ground conditions
- Built environment

2.2.1 The Modified Mercalli Intensity (MMI) scale

Earthquake effects, based on observed consequences, are rated using the Modified Mercalli Intensity (MMI) scale, which ranges from I (imperceptible) up to XII (total destruction), see table below.

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognise it as an earthquake. Standing motor cars may rock slightly. Vibrations are similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: Replicated from the USGS https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale

2.2.2 Magnitude vs Intensity (MM)

- Earthquake magnitude is related to the energy released at its epicentre.
- The intensity of an earthquake refers to the level of ground-shaking at a given location.
- Earthquake intensity decreases with increasing distance from an earthquake's epicentre.
- The Modified Mercalli Intensity (MMI) scale is commonly used to describe the damage.
- The Modified Mercalli Intensity (MMI) scale is commonly used to describe the damage and felt effects of an earthquake at a given location.
- MMI is a qualitative assessment of earthquake effects on structures and people.
- Earthquake magnitude is a quantitative measure based on physical recordings made on seismometers.

Source: GA website.

2.2.3 Damage and disruption

Below summarises the possible types of damage and disruption that may result from a major earthquake.

Critical infrastructure and building damage

Individual buildings, roads, bridges, and tunnels are likely to suffer damage. Waste management infrastructure, including landfills, may also be damaged. Buildings may include homes, businesses, and essential facilities such as hospitals, schools, and emergency service facilities. Vulnerable buildings pre-dating 1989 are likely to be impacted, with consideration to toppled chimneys. The New South Wales (NSW), Newcastle Earthquake in 1989 caused damage to 35,000 homes, 147 schools and 3000 commercial and/or other buildings. This large-scale damage can cause displacement and isolation in the community.

Health impacts

Casualties and injuries are likely to result from large damaging earthquakes. People may also become trapped requiring rescue. The ability for health services such as Ambulance Victoria, Health Services and General Practitioners (GPs) to respond may be impacted by damage or destruction of facilities such as hospitals, clinics or branches. Secondary public health impacts may occur if essential services are not readily available after the impact of an earthquake.

Displacement and isolation

As a consequence of infrastructure damage, people will become displaced, requiring temporary accommodation. The amount of time for which people would need temporary accommodation would depend on the number of family and friends that could take them in, how long it would take for building inspections to be made, how long it would take lifeline services to be back up and running, and how long it would take for residents to regain access after areas were cordoned off or had access ways destroyed/blocked People can also become physically isolated as a consequence of damage, triggering the need for resupply of essential items.

Transport access or disruption

Roads or railways may be blocked as a consequence of debris from fallen buildings, damage to the road infrastructure from landslides or below ground infrastructure failures (pipes/culverts). Roads may also be shut where there is the potential for, landslides or surrounding buildings to fail during aftershocks, even if no debris has yet fallen. Also, potential for disruption to waste collections. As a result, and as observed in the 2011 Christchurch earthquake experience in New Zealand, areas of a major CBD may be cordoned off and roads closed a significant time following the event. Bridges and tunnels will likely be closed for inspection.

Public Transport Disruption may occur as a result of some rail and light rail bridges being damaged, or airport runways or port infrastructure, or bus networks reliant on road infrastructure being extensively damaged.

Impacts to transport infrastructure may also affect the ability to access electricity, gas, water and telecommunications assets.

Economic

Widespread damage and disruption will lead to direct and indirect economic impacts that will require a broad economic development strategy to be created and complemented by more specific strategies at the sectoral level across transport and ports, resources, investment attraction and facilitation, trade, innovation, regional development, and small business, together with key services to sectors such as agriculture, the creative industries, extractive resources, and tourism.

Assistance to business to navigate and access available information, advice, and support and recovery planning to ensure return to trade may be required.

Energy supply

There is the potential for an earthquake to damage or destroy electricity, gas or liquid fuel infrastructure which may lead to energy supply disruption. Damage to critical energy infrastructure such as high-pressure gas pipelines due to an earthquake may result in disruptions of electricity/gas supply to widespread consumers. Damage to brown coal mines and associated infrastructure can also cause an energy disruption.

Below describes damage to the electricity network from the Newcastle 1989 earthquake in NSW:

"The Newcastle earthquake of 1989 had a significant effect on the high voltage transmission assets of the NSW electricity supply grid operated by the Electricity Commission of NSW. Multiple failures of equipment, mainly switchgear, occurred in a number of the electricity substations closest to the earthquake epicentre. These failures initiated a general and immediate shut-down of electricity supply to both industrial and domestic consumers in the affected area. The response of the Commission to this unexpected emergency was immediate and effective. Operational recovery saw high voltage supply restored to major industrial customers 1½ hours after the incident. Restoration of supply for general distribution began within 30 minutes, with all bulk supply points energised after 2½ hours. Of course, the damage then had to be assessed, plant safety assured, and repairs commenced so that normal levels of reliability could be returned to the community. This phase of restoration took three weeks to repair most major circuits and many months to complete. In the latter stages, it was accompanied by a third phase of review which identified any areas where either the system design or the response of a power authority to any future such emergency may be improved."

Mines and Quarries

Significant earthquakes have to potential to impact the stability of mines and quarries, which may result in open pit wall collapse, underground collapse, tailings dam breaches or damage to associated critical infrastructure (eg coal supply, nearby roads etc). This could also include entrapment of mine workers.

Water supply

Major water facilities such as pumping stations, water treatment plants, reservoirs, tanks and distribution network may experience damage. Damage may occur across the entire network. Breakage of pipes is likely to be widespread and concerns over contamination may render the water not suitable to drinking.

Water storage

Water storages and large dams/levees may be damaged and may lead to sunny day failure, where the failure of a dam/levee infrastructure occurs with the water level at the normal pool elevation and no rainfall with the potential to cause catastrophic or major flooding downstream of dams.

Wastewater

Extensive damage may occur to wastewater systems can occur even without the occurrence of liquefaction.

Telecommunications

Telecommunications infrastructure may suffer damage, power loss, and be overloaded. Loss of telecommunication can be due to a variety of reasons such as outages of telecommunication services, website outages, and loss of power, meaning, household broadband networks need power to operate, mobile phones cannot be charged, and home phones will not work.

Below summarises the 2011 Christchurch earthquake experience in New Zealand:

"Cordless phones immediately ceased to work where electricity failed. Some physical damage to telecommunications assets also occurred but the effects were secondary – congestion largely resulted from the sudden substantial increase in call attempts rather than to equipment failure. Battery life at cabinets and cell towers also quickly became a constraint on telecommunications performance and significant losses of cellular coverage."

Chemical and high-risk industrial plants

These are usually located away from residential zones. It is expected that high risk facilities will be designed for increased resilience to earthquake damage, thus the probability of an accident induced by an earthquake is classified as low. If, however, there was damage, it could be such as in the 1998 Longford gas explosion in Victoria.

Waste management facilities

Waste management facilities including landfills may be impacted by earthquake damage. The scale of damage is likely to be variable and may include damage to key infrastructure and environmental controls. Damages to waste management facilities and adjacent road infrastructure may impede early recovery efforts (removal of waste and debris).

Hazardous material release

Hazardous materials are not exclusive to heavy industry and may be released as a consequence of building collapse. These may include carcinogenic or corrosive gases, or poisonous liquids that contaminate the water table. Asbestos was used in Australia from the 1950's until 2003 when it was banned. Asbestos may be exposed as a result of earthquake building damage in an earthquake. Irrespective of the risk, it will impose large clean-up costs and require the cordoning of many properties.

A range of other hazardous materials are present in all environments including domestic households (for example paints, fuels and pesticides stored in garages and asbestos), damage to underground infrastructure including waste water infrastructure (carrying tradewaste), pipelines and underground storage tanks may also result in hazardous material releases. Damages to commercial and industrial facilities may also result in subsequent hazardous releases. These materials may be in all forms and may contaminate land, water (both surface and ground water) and atmosphere. Impacts may be acute or may not be detected for extended periods of time (potentially years). Responding to hazardous material releases, especially those to land or water environments can generate significant volumes of waste, which may require highly specialised waste collection, transportation, storage and treatment infrastructure and technology. Some waste streams especially those that have been mixed, reacted or for which the nature/origin is unknown (which is a likely circumstance during an earthquake) can be very challenging to treat and there may be limited or no treatment capacity available within the state and/or nationally to treat and may need to be safe stored whilst suitable long-term arrangements are enacted.

Fire following earthquake

Fire following an earthquake has caused extensive damage in the past caused by downed powerlines and ruptured gas mains. Well known cases are the San Francisco 1906 and Tokyo 1923 earthquakes, where much of the damage was caused by fire.

Extensive fire following earthquake damage is less common in present times and will likely be localised to high-risk sites, as was the case for the Cosmo Oil Company fire following the 2011 Tohoku earthquake in Japan. In that event, the continued functioning of the water supply for firefighting would become critical.

Long series of strong aftershocks

A series of aftershocks are possible after an earthquake event. The Christchurch earthquake event was notable for its unusual frequency of aftershocks, with the most damaging event (M6.3 Lyttelton) occurring as an aftershock of the original event (M7 Darfield) 4 months earlier.

This earthquake sequence seriously disrupted recovery activities, and although unusual, aftershocks did more damage than the main quake. This occurred because the aftershock was located directly below the CBD, whereas the main shock was located to the west of the CBD at a distance of 30 km.

The earthquake sequence in Christchurch did eventually move away from the city only one year after the main event and posed a serious challenge to the recovery of the Christchurch CBD.

Other impacts

Consideration should also be given to:

- Land or mudslide: In addition to ground shaking, earthquakes of 4.0 or greater may also trigger landslides.
- Tsunami: Undersea earthquakes can cause a tsunami or a series of waves that can cause extensive coastal damage.
- An earthquake may generate significant volumes of wastes, especially construction and demolition wastes (but also all other waste streams) and existing waste management infrastructure may be unable to service this rapid increase in volume. During major earthquakes overseas stand-alone waste management are often established and run for extended periods of time. For example, the Burwood Resource Recovery Park established following the Christchurch earthquake operated for 8 years.

3. Managing earthquake emergencies

3.1 Emergency management priorities

The State Emergency Management Priorities that are outlined in the SEMP guide all decisions before, during, and after any emergency, and apply to all aspects of this plan. The priorities are:

- Protection and preservation of life and relief of suffering is paramount. This includes:
  - Safety of emergency response personnel.
  - Safety of community members, including vulnerable community members and visitors/tourists.
- Issuing of community information and community warnings detailing incident information that is timely, relevant, and tailored to assist community members to make informed decisions about their safety.
- Protection of critical infrastructure and community assets that support community resilience.
- Protection of residential property as a place of primary residence.
- Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability.
- Protection of environmental and conservation assets that considers the cultural, biodiversity, and social values of the environment.

3.2 Shared responsibilities

The SEMP recognises that emergency management is the shared responsibility of all Victorians, not just the emergency management sector. The 'shared responsibility' approach seeks to ensure:

- The interests, values, and expectations of stakeholders in, or members of, communities are understood and considered.
- Ownership of the SEMP and responsibility for its implementation is broadly shared.

Examples in the context of an earthquake include:

- Individuals being aware of their earthquake risk and following advice from emergency services when responding to warnings.
- Councils and communities including earthquake risk within their Community Emergency Risk Assessment (CERA) and mitigation activities.
- Industry and businesses planning for the risk of disruption, and ensuring arrangements are in place to maintain critical services and assist communities where possible.
- Engaging with communities to:
  - Plan the management of earthquake risk.
  - Provide emergency information and earthquake warnings.
  - Ensure an effective, well-coordinated response during an earthquake.
  - Recover and learn following an earthquake and build their resilience to future events.

Section 3.5.3 sets out community engagement for preparedness.

3.3 Roles and responsibilities

The SEMP details the roles and responsibilities for earthquakes. Several primary roles are noted in the following.

3.3.1 State Crisis and Resilience Council

The State Crisis and Resilience Council (SCRC) is the peak crisis and emergency management body to the Victorian Government and provides advice to ministers and relevant cabinet sub-committees. It is responsible for the development and implementation of whole of government emergency management policy and strategy. It does not make operational or tactical decisions.

3.3.2 Emergency Management Commissioner

Under the *EM Act*, the EMC has legislated management responsibilities across major emergencies. These include response coordination, ensuring effective control arrangements are established, and consequence management.

3.3.3 Victoria State Emergency Service

VICSES is the control agency for earthquakes as defined in the roles and responsibilities section of the SEMP. Specifically related to the earthquake hazard, the following activities listed expand on those outlined in the VICSES agency role statement in the SEMP, with VICSES taking accountability for:

- The strategic and operational planning for response.
- Provision of public information and warnings, including the provision of public safety advice to the community.
- Providing advice to the State Response Controller and Regional Controllers on appropriate structures and initial operational activities in response to an earthquake.
- Supporting Victoria Police with evacuations.
- Rescue of persons entrapped by collapsed structures in partnership with other rescue agencies including CFA and FRV.
- Protection of critical community infrastructure from further damage.

3.3.4 Supporting agency roles and responsibilities

A range of government and non-government agencies/organisations have the skills, expertise, and/or resources to support earthquake emergency response, relief, and recovery.

Refer to the SEMP agency role statements for further details of the roles and responsibilities that support agencies may undertake across all the emergency management phases related to earthquake.

3.3.5 Emergency Management Teams

For earthquakes which are widely felt and/or GA have advised of a magnitude of 5.0 or above, the Emergency Management Teams EMT's at state (State Emergency Management Team (SEMT)) and regional tiers will be activated to coordinate initial intelligence relating to impact and consequence, ahead of Incident Control Centres (ICCs) and Incident EMTs being established to manage the response, including any initial relief requirements. EMTs should be based on consequence management and consider the National Emergency Management Agency Framework and connectivity to the National Coordination Mechanism

More detailed information on EMTs is outlined in the SEMP.

3.3.6 Emergency Management Planning Committees

Emergency Management Planning Committees operate at the state, regional and municipal tiers to guide mitigation and preparedness activities.

More detailed information on emergency management planning committees is outlined in the SEMP.

3.4 Mitigation

Mitigation activities for earthquakes include, but are not limited to:

- Building compliance to engineering standards (planning and building standards/regulations).
- Critical infrastructure (engineering) risk and vulnerability assessments and maintenance regimes (essential services, dams/levees, buildings, roads, bridges, tunnels).
- Community engagement, education, and awareness.

Information on the roles and responsibilities of participating agencies for mitigation activities are detailed in the SEMP.

Information regarding resilience and business continuity in Victoria's emergency management sector is detailed in the Emergency Management Sector Outcomes Framework and Strategic Roadmap 2022–28.

3.4.1 Geoscience Australia services

GA operates the National Earthquake Alerts Centre to provide continuous monitoring, analysis and alerting of earthquake activity. This allows for timely advice to VICSES in support of the control agency roles.

Access to data about people, property and infrastructure is made available via the Australian Exposure Information Platform (AEIP). This data provides consistent exposure information about buildings, demographics, community infrastructure and agricultural commodities to help understand what could be at threat from earthquakes. GA provides a variety of earthquake data and products via their community safety website to support and improve planning and preparedness.

Further information regarding earthquakes is provided on both the GA website and Twitter account.

Victorian earthquake scenario

The Earthquake Impact Scenario for Melbourne, Victoria report was produced in 2016 by GA for Emergency Managers. The document presents an impact assessment of an earthquake scenario centred under the CBD of the City of Melbourne and outlines the methodology used.

The document includes:

- Maps of mean expected ground shaking intensity for each scenario.
- Maps of average percentage economic loss for buildings in each statistical area.
- Estimates of fatalities and injuries.
- Tables of aggregated losses and estimates of the numbers of buildings in each of four damage states.
- Estimates of resident numbers requiring temporary accommodation.

The information from the scenario assessment was designed to be used to inform emergency management planning and preparation in Victoria and support the national understanding of potential earthquake impacts.

Notifications to the public

The VicEmergency website and app automatically displays an incident symbol for earthquakes recorded in Victoria and published on the GA website.

When an earthquake notification is issued or updated, GA will inform the VICSES State Duty Officer (SDO). The SDO assesses the requirement to issue a community notification (See Section 3.4.2).

3.4.2 VICSES led agency and community notifications

Agency notifications

VICSES and GA work in close partnership to ensure the timely notification of earthquake events in Victoria.

All earthquake notifications will be provided directly from GA to the VICSES SDO.

Irrespective of issuing a warning, GA should attempt to contact the VICSES SDO whenever an earthquake has been monitored. The VICSES SDO will then initiate contact with other emergency service agencies.

The Emergency Services Telecommunications Authority (ESTA) is to ascertain if there has been an increase in Triple Zero or 132 500 calls resulting in requests for assistance to help inform any response.

VICSES implements a detailed notification process for earthquake events, which is documented in the VICSES Standard Operating Procedure 046 and in relevant emergency management sector JSOP 3.16.

This includes:

- The VICSES State Agency Commander (SAC) notifying the State Response Controller (SRC), who will in turn advise the State Control Team (SCT), and for magnitude 4.0 and above will notify the SEMT.
- The VICSES Regional Agency Commander (RAC) notifying the Regional/Zone Controller who will in turn advise the Regional Control Team (RCT), and for magnitude 4.0 and above will notify the REMT.

Community notifications

VICSES seeks to meet the second state emergency management priority for the need to be proactive in notifications to the community, regarding an earthquake and its associated impacts.

VICSES leads the coordination of business rules that govern the issuing of community notifications upon advice of an earthquake from GA.

They can be found in the following location: Earthquake: EMCOP – Library – IMT Toolbox – IMTTB – Public Information – EMCOP Business Rules – Earthquake Business rules, or here.

The business rules outline that the earthquake community notifications are managed by the VICSES SDO and/or SAC. The business rules also set triggers for when community information is issued, and what warning level is required. The earthquake magnitude and impacts guide the triggers for warnings levels. Other impacts and consequences that occur as a causation from the Earthquake may result in localized warnings –e.g.: Fire, Gas or Liquid Fuels – Fire Warning, Dam Breach - Flood Warning.

3.4.3 VicEmergency and warning channels

VICSES use the state endorsed multi-hazard warning platform, EM-COP Public Publishing, to disseminate public information and warnings to the community via VicEmergency and its associated channels.

VicEmergency warning recipients include emergency broadcasters (i.e., commercial and ABC radio) who are required to re-disseminate warning information and sound the Standard Emergency Warning Signal (SEWS) if required, in accordance with the Emergency Broadcasting Practice Note and the agreed Memorandum of Understandings (MoU).

A range of additional approaches are used by VICSES to disseminate public information and warnings that are selected, based on the needs of the community and magnitude, and impacts of the earthquake. Examples include:

- Media, including the use of social media for lower end earthquake events with minimum community interest and/or impacts. Social media will be proactively used as an early communication tool to ensure that emergency services are aware of an earthquake being felt prior to the issue of more formal community notifications/warnings for higher magnitude events.
- Door knocking (e.g., in the event of telecommunications outages, evacuation of damaged buildings etc.)

- Emergency Alert (EA) for urgent dissemination of warnings to telephones (including mobile phones) within a specific geographic location.

Adjoining states will be consulted over public information messages if impacts have occurred in a border area.

3.4.4 VicEmergency Hotline

Community members can call the VicEmergency Hotline (1800 226 226) to access emergency information during and after major incidents in Victoria, including flood events. It also offers information to help Victorians plan for and recover from emergencies.

The VicEmergency Hotline is staffed by operators from Monday to Friday 8:00am – 6:00pm, with opening times extended during significant emergency events. The hotline also features an automatic text to speech function, which ensures Victorians can access important emergency information outside of operator hours, at any time of the day or night, by entering their postcode.

The hotline is managed by the DEECA Customer Contact Centre. The VICSES SAC may, in consultation with the SRC, request enhanced staffing post the initial impact and throughout the period of expected after shocks. This may include extending the operating hours of the centre beyond standard arrangements, including weekends.

3.4.5 Seismology Research Centre

The Seismology Research Centre has an agreement with Victoria's large dam owners to notify them of an earthquake so that an inspection of critical structures can be made for any damage. Dam owners have funded some of the seismographs and accelerometers through Seismology Research Centre and belong to a notification network. Real time information is distributed via text message (within an agreed timeframe) providing, earthquake magnitude, intensity, epicentre and other key information needed to conduct a quick risk assessment.

For example, when the Woods Point earthquake occurred in 2021, dam owners received a notification of the event within a few minutes and were able to send out crews to inspect structures shortly after.

Quarterly reports on equipment status and earthquakes which have occurred during the reporting period are developed and distributed by Seismology Research Centre to Victoria's large dam owners to increase awareness.

3.5 Preparedness

Preparing for earthquake events includes developing arrangements to ensure that resources and services needed to respond can be efficiently mobilised and deployed.

Preparedness activities include:

- Identifying and assessing the risk.
- Developing emergency management policy, arrangements, and plans.
- Ensuring adequate resources, systems, and processes are in place.
- Training response personnel and educating stakeholders and potentially affected industries and communities.
- Maintaining and developing expertise.
- Conducting exercises.
- Evaluating preparedness and response activities.
- Ensuring the necessary relationships, formal and informal mechanisms are in place across government and industry to support community outcomes.

The risk management approach aligns with the SEMP and outcomes and objectives of the Sendai Framework for Disaster Risk Reduction 2015–2030 and the National Disaster Risk Reduction Framework. At the state level, Emergency Management Victoria (EMV) is responsible for coordinating the state-wide emergency risk assessment published in the Emergency Risks in Victoria Report.

3.5.1 Regional earthquake emergency planning

Where an earthquake is identified through the Regional Emergency Management Planning Committee's (REMPC) Regional Emergency Risk Assessment (RERA) as a high risk to a region, VICSES will provide advice and support to the REMPC to ensure the Regional Emergency Management Plan (REMP) contains at a minimum arrangement for the response to an earthquake event based on all-hazards and all-agency response.

Regional Earthquake Sub-plans are prepared by VICSES for regions as warranted by the assessed earthquake risk. The REMPC may adopt the prepared earthquake plan as a sub-plan to its REMP based on regional risk assessments.

3.5.2 Municipal earthquake emergency planning

Where an earthquake is identified through the Community Emergency Risk Assessment (CERA) as a high risk to a community, VICSES will provide advice and support to the Municipal Emergency Management Planning Committee (MEMPC) to ensure the Municipal Emergency Management Plan (MEMP) contains at a minimum, arrangements based on an all-hazards and all-agency response to earthquake.

Municipal Earthquake Sub-Plan are prepared by VICSES for municipalities as warranted by the assessed earthquake risk. The MEMPC may adopt the prepared earthquake plan as a sub-plan to its MEMP based on community emergency risk assessments.

3.5.3 Community preparedness

VICSES has actively implemented the Community Resilience Strategy Renewal 2019-22, and this is now being reviewed as part of VICSES Strategic Planning 2023-2027. A key and measurable outcome of the strategy has been, and is envisaged to be, an increase the level of interest, and support behaviour change within communities, so they are more aware, informed and prepared for emergencies by supporting them to understand their risk, and the relevance of taking action before, during and after emergencies. Information can be found via the VICSES website.

Community preparedness material for earthquake were updated at the time of publishing this plan can also be found via the VICSES website.

3.6 Response

3.6.1 Readiness

GA is responsible for monitoring earthquakes and providing notifications and advice to VICSES and the State Control Team (SCT). See Section 3.4.1 for details for GA services.
The VICSES Chief Officer Operations (COO) or delegate is responsible for notifying the EMC (in accordance with JSOP 3.16 Significant Event Notification). The EMC can assist through the SCC to notify the State Coordination Team and the SEMT.

VICSES Readiness and Activation Triggers were reviewed as part of the updating of this plan to align to the readiness activation framework for other Class 1 Emergencies, and to provide interim guidance until further consultation with agencies can occur.

In the majority of cases, agency personnel are likely to have felt moderate to larger earthquakes before notifications will have occurred. In the event of a significant earthquake, agency commanders should consider immediate deployment to their RCC or the SCC. Telecommunications may have been impacted by the earthquake, limiting the ability to notify of centre activations identifying other methods of Satellite Phone, Pager etc.

Consistent with VICSES SOP046:

- Earthquakes of a magnitude of 3.5 to 4.4 will result in the activation of a VICSES Regional Operations Command Centre (ROCC) to manage the response and intelligence gathering to understand if there have been any community impacts and consequences.
- Earthquakes of 4.5 to 5.5 , with widespread felt reports, are likely to result in some level of community impact, consequences and/or disruption, and therefore result in Readiness Level 3 being activated with RCCs established within the Intensity ShakeMap* area identified by GA to coordinate initial intelligence around impacts and consequences for the consideration of response. The SCC will also be activated at Tier 1 with the expectation that all response agencies have a presence within the first hour.
- Earthquakes of a magnitude of 5.5 or greater, impacting multiple regions, will trigger the SCC to activate to Tier 2 and RCCs will consider the standing up of relevant ICCs to manage the initial response including relief requirements.

See appendix, page 30

3.6.2 Regional Operations Command Centre activation

The VICSES Operations Management Manual (OMM) articulates the operational management structures and systems used by VICSES in the management of its command and control responsibilities under the *Victoria State Emergency Service Act 2005 (VICSES Act)* for flood, storm, earthquake, tsunami, landslide and rescue to ensure effective and efficient management of operations.

The OMM should be read in conjunction with other VICSES doctrine including state, regional and local plans, SOPs, policies and approved Joint Doctrine.

The OMM is available to VICSES members on the VICSES Hub.

3.6.3 SCC and RCC activation - SRC response and relief considerations

When the readiness triggers have been met, the SRC should consult with the VICSES SAC to assure the following considerations are made:

- Establishing the control structure for managing the event including consideration of functional divisions and sectors within the operation structure, rather than just geographic divisions and sectors (refer Appendix 2).
- Confirming agencies at all tiers are activated and request Regional Controllers to coordinate the gathering of initial information/intelligence of potential community impacts and consequences, including any disruption to services through standard intelligence gathering procedures and via trained field observers.
- SRC to convene a Joint Regional (Zone) Controller/State Control Team within 1.5 hours of initial notification of 4.5 or greater – with the focus on agencies reporting on any initial impacts.
- SRC to coordinate with the EMC to convene the SEMT within 2-3 hours of initial notification of 4.5 or greater, with the focus on agencies reporting on any initial impacts and their plans for undertaking assessments of any critical infrastructure.
- Providing consistent public information and necessary warnings to the community.
- Confirming agencies with call taking responsibilities, including Emergency Services Telecommunications Authority (ESTA), have resources in place and back up.
- Confirm positioning of skilled and equipped personnel to conduct rescue operations and command as required.
- Implementation of evacuation and emergency relief plans.
- Identifying the likely consequences of the earthquake event and any interdependencies that may affect planning.
- Confirming agencies have adequate resources in place to fulfil their responsibilities and are planning for sustainment and surge capacity, including identification of need for inter-state assistance.

- Identifying mass gatherings and large public events that maybe at-risk of further after shocks, and arrangements to ensure the safety of individuals attending.
- Positioning of Emergency Management Liaison Officers from key support agencies to the SCC and RCCs, where appropriate.
- Ensure that arrangements are in place for initial impact assessment data to be collected and then incorporated into the operational response.
- Arranging for regular meetings of the state, regional and incident EMTs.
- Providing whole-of-government situation reports to relevant government ministers, via relevant agency or department.

3.6.4 Cross jurisdictional arrangements

The cross jurisdictional arrangements to support operational response to earthquake events are underpinned by national and inter-state agreements, including:

- Arrangement for Interstate Assistance (AIA) which provides the national governing arrangements for deployments and support.
- Interstate MoU between VICSES and South Australia (SA) SES and NSW SES respectively, which detail arrangements for cross jurisdictional response within 40km of the state boundaries.
- Local arrangements are also detailed in VICSES regional plans.

In the event of major impacts and consequences, the VICSES COO or SRC may request the EMC seek the activation of the Commissioners and Chief Officers Strategic Committee (Operational) (CCOSC) to be conveyed to look at initial requests for assistance from other jurisdictions.

3.6.5 Local knowledge

The community and other organisations can provide valuable local knowledge about incidents and how they may evolve. This information is commonly referred to as local knowledge.

It is essential that communications pathways are created and maintained to ensure appropriate local knowledge can be captured before, during and after incidents.

As an incident escalates from local control to a larger incident management structure, it is essential that local knowledge capability is retained within the overall structure.

VICSES has developed a tool to improve communication from Field Observers to Incident Management Teams (IMTs) using the Snap, Send, Solve app. A network of local Field Observers has been created statewide to provide real-time information and images from the field to the Intelligence Section in IMTs to support situational awareness and intelligence verification.

The VICSES RDO is responsible for the activation of Field Observers - refer to SOP073 Field Observer for role information and activation process. Consideration will be given to incorporating people with relevant local knowledge into relevant roles within an IMT.

VICSES has developed a Local Knowledge Policy which outlines key strategies for incorporating local knowledge into the management of emergency events, and can accessed via the VICSES website.

3.6.6 Initial impact assessment

Given the nature of earthquakes, the Regional (Zone) Controller is responsible, with the Regional Control Team agencies, for initiating and managing **Initial Impact Assessments (IIA).**

In the initial phase of response, this may involve:

- Aerial reconnaissance of the impact area identified in the GA Intensity ShakeMap.
- Individual agencies reporting on community impacts within communities where they have a presence.
- The SCC Intelligence and Public Information Cells monitoring media channels and community sentiment through the likes of social media.

The aim of IIA is to capture, during the initial 48 hours of an emergency, the nature and scale of the earthquakes impact on people, community infrastructure, and the economic, natural, and built environments, in order that emergency relief and early recovery activities can commence.

IIA typically begins in the first 24-48 hours of an emergency event and is focused on the collation of immediate impact data. IIA is a preliminary assessment generally from visual inspection undertaken by response agencies, assisting in determining the scale and impact of the earthquake impact emergency on people, community infrastructure, and the economic, natural, and built environments.

IIA provides early information to assist in the prioritisation of immediate needs of individuals and communities, requirements of Secondary Impact Assessments (SIA), and supports commencement of emergency relief and early recovery activities. To ensure the expedient collection of information, the Incident Controller may task personnel from any response agency to collect relevant information.

The EMC is responsible for ensuring the coordination, collection, collation and reporting of incident data and impact assessment processes as required. All agencies have a responsibility to assist the EMC with the IIA process, as per the SEMP and the relevant impact assessment guidelines available on EM-COP. The data from IIAs is used to identify where to focus early recovery activities (including SIA).

3.6.7 Evacuation

Evacuation orders are not compulsory in the State of Victoria however, the Australian Institute for Disaster Resilience (AIDR) Evacuation Planning Handbook defines evacuation as a risk management strategy that may be used to reduce loss of life or lessen the effects of an emergency on a community ,or during, an emergency. It involves the planned movement of people threatened by a hazard to a safer location and, typically, their eventual safe and timely return. For an evacuation to be effective, it should be appropriately planned and implemented.

Evacuation is a scalable activity in that it may be applied to individuals, a house, a street, a large facility (i.e., school or hospital), a suburb, a town or a large area of the state. Where an area is identified (by means of local knowledge, prior history of a higher risk of evacuation, etc.) as requiring a specific detailed evacuation plan, consideration should be made to include this plan as part of the respective MEMP.

The Incident Controller is responsible for making a decision as to whether evacuation is a safe option for communities and individuals and activate this in collaboration with Victoria Police. In making this decision the Incident Controller may seek advice from other agencies or communities, as detailed in JSOP03.12 – Evacuation for Major Emergencies and Evacuation Guidelines.

3.6.8 Energy, communications, water, agriculture, and transport disruptions

Earthquakes can disrupt energy, communications, water (potable and waste), agricultural business and industries, and transport services.

Refer to SEMP Roles and Responsibilities for details on restoration of services resulting from earthquakes in various settings. Refer to SEMP for details of coordination arrangements related to restoration of services.

3.6.9 Health response

During an earthquake event, the Department of Health has a support function to coordinate the health response and works to minimise the impacts on individuals, communities, public health, and the health system.

The SEMP Health Emergencies Sub Plan outlines the arrangements for coordinating the health and medical response to emergencies.

Earthquakes have the potential to affect electricity and gas supplies across the state, and in some instances lead to widespread and prolonged outages impacting many people. The Department of Health works with many partners to facilitate support for these groups during widespread and prolonged outages

The Department of Health also administers Victoria's safe drinking water regulatory framework, which requires water businesses to have emergency management arrangements and procedures for dealing with an incident, event, or emergency that may adversely affect the quality or safety of drinking water or result in water being supplied that poses a risk to human health. The Department of Health is also the control agency for drinking water contamination.

In response to mass fatalities, Victoria Police will manage the disaster victim identification process and will administer the handling and investigation of deceased persons and their subsequent removal on behalf of the State Coroner (Refer to SEMP Roles and Responsibilities – Table 8).

3.6.10 Animal welfare

Earthquake events may result in significant displacement or other welfare issues for livestock, companion animals and wildlife. The SEMP Roles and Responsibilities defines DEECA as the control agency for wildlife welfare arising from a declared emergency and DEECA – Agriculture as the support agency for welfare of livestock and companion animals. The Victorian Emergency Animal Welfare Plan provided a framework for responding to animal welfare emergency needs in Victoria.

3.6.11 Relief

Emergency relief involves the provision of essential needs to individuals, families, and communities during and in the immediate aftermath of an emergency. The relief needs of individuals, families, and communities will be complex and specific to each incident. Relief planning and coordination is a function of the Controller from the onset of the emergency. However, there are several overarching relief priorities for earthquake emergencies which are:

- Provision of need-based assistance for the immediate health and wellbeing of individuals and communities.
- Planned and timely access to restore critical infrastructure (including transport infrastructure, water (potable and waste), electricity and gas, and telecommunications).
- Planned and timely return of communities to earthquake impacted areas to minimise further physical and psychological harm.
- Provision of timely, relevant, and tailored relief information to assist community members to make informed decisions.
- Effective and efficient state, region/incident and local relief coordination arrangements.

Refer to the SEMP for the relief responsibilities of the Incident Controller, Regional Controller and the SRC.

In line with the SEMP Roles and Responsibilities, relief coordination operates at both tier and functional activity levels. Tier level coordination is as follows:

- State: ERV will coordinate relief arrangements at the state level.
- Regional: DFFH will coordinate relief at the regional level.
- Local: Municipal councils are responsible for coordinating relief at a local level.

Several agencies, government departments, and non-government organisations have responsibility for coordinating or providing direct assistance to individuals, families, and communities, or indirect assistance through the resupply of essential goods or services to communities isolated in an emergency. State leads are identified in the SEMP Relief Services and Co-ordination table.

3.6.12 Debris removal and cleanup

Refer to SEMP Roles and Responsibilities for details on debris removal and clean up resulting from an earthquake in various settings.

Debris removal and cleanup will need to comply with the relevant Environment Protection Act and Regulations in the manner of minimising the risks of harm to human health and the environment.

3.6.13 Management of spontaneous volunteers

Refer to SEMP Roles and Responsibilities Table 14 for details on management of spontaneous volunteers.

3.7 Recovery

Under the EM Act 2013, the EMC is responsible for consequence management and coordinating recovery for major emergencies and can delegate this responsibility to relevant agencies.

As per the SEMP, Emergency Recovery Victoria (ERV) is responsible for state and regional recovery coordination and state relief coordination, partnering with all levels of government, business and not-for-profit organisations to enable locally driven and locally delivered recovery. Municipal councils are responsible for municipal recovery coordination, including coordination of local recovery activities and post emergency needs assessment to determine long-term recovery needs.

Emergency Recovery Victoria (ERV) formally transitioned from the Bushfire Recovery Victoria (BRV) in October 2022.

3.7.1 Transition to recovery

The SEMP specifies the arrangements for the coordinated planning and management of transition from response to recovery in Victoria.

Transition to recovery may occur on a municipality-by-municipality basis, with the support of ERV, while response may be still occurring in other municipalities.

The response function will continue at least until the following conditions are met:

- All rescues have been accomplished.
- All injured have been attended to.
- Displaced people have been provided with shelter, and essential services.
- Aftershocks greater than magnitude 3.5 are no longer occurring.
- Impacts to community assets and infrastructure are at repair and/or rebuilding phase (noting this may mean significant levels of disruption may still be present within the community).

Transition plans should be developed collaboratively between Incident Controllers and Regional Controllers, as well as ERV Recovery Coordinators and Municipal Recovery Managers at the relevant tiers with appropriate and agreed resources, both prior to and post transition.

The community must receive continuous services during the transition.

An important component is a seamless transition of communications, where recovery messaging should be integrated with response information as early as possible to facilitate a smooth transition to recovery, alongside other components required for effective transition to recovery.

Key concepts guiding transition include:

- Coordination of transition from response (including relief) to recovery, in partnership with the lead recovery agency, and in consultation with other agencies affected by the transition.
- Seamless transition of information, impact data, and consequence planning.
- Continuity of emergency management for individuals and community.
- Integration of recovery within the IMT – supporting knowledge management into recovery.

Transition from response to recovery is not always a clearly defined step. For an earthquake impacting on a large geographic area, there may be a legitimate need to instigate recovery in some areas while the response phase is still in operation. This is a phased transition to recovery. The teams at the relevant incident, regional and state tiers should agree on the timing and phasing of the transition, the activities required and who is responsible.

3.7.2 Agency roles and responsibilities across the lines of recovery

In Victoria, recovery is undertaken across five lines of recovery – people and well-being, Aboriginal culture and healing, business and economy, environment and biodiversity, and buildings and infrastructure. This provides a framework within which recovery can be planned, delivered and monitored. This framework can be adapted to meet the needs of people and communities affected.

People and wellbeing

People's health, safety and wellbeing can suffer after an emergency event. Psychosocial support is integral to the people and wellbeing line of recovery. Support needs relating to trauma, post-traumatic stress disorder, and vicarious trauma will vary for individuals, communities and service providers impacted by the disaster. Activities in this line of recovery address physical and mental health and wellbeing, financial and social support.

DH is the recovery coordinating agency for health and medical assistance. DFFH is the recovery coordinating agency for psychosocial support, including coordinating the provision of mental health services and information and targeted psychosocial support.

Aboriginal culture and healing

For Aboriginal people, relationships to country, culture and community are not only interconnected, but intrinsically linked and enmeshed with identity. Aboriginal people may therefore be uniquely impacted by a natural disaster. It is critical to recognise that any impact is compounded by, and cannot be detached from, trauma incurred due to longstanding social dislocation and upheaval as a direct result of past policies of governments at all levels.

Activities in this line of recovery support the recognition of culture and knowledge, physical and mental health and wellbeing, engagement with education, respect for land practices, connection to land, water and wildlife, and strengthened representation in workforce. Recovery activities to meet these commitments span across all lines of recovery but are unified through this line of recovery and its outcomes.

Environment and biodiversity

Emergencies can cause destruction to flora and fauna through loss of life and habitat. Emergencies also compromise Victoria's natural assets and resources, as well as public use of parks and forests enjoyed by Victorians and visitors alike.

Activities in this line of recovery look to support the vitality of biodiversity through prioritisation of threatened species and native vegetation, and the restoration of natural habitats. Natural resources are safeguarded through activity that supports sustainable use of land, water and energy resources. Environmental recovery also looks to restore the productive and accessible amenity of parks and forests for recreation and nature-based tourism.

DEECA leads coordination of recovery activities for natural environment, public land and waterways, threatened ecosystems and species and wildlife welfare. As with all lines of recovery, the community plays a key role in supporting the delivery of these activities.

Business and economy

Businesses and local economies suffer a range of setbacks after emergencies, including loss of business and livelihoods and impacts to supply chains and demand. Business owners may incur multiple hardships, and this is important to consider as part of the recovery effort.

Activities in this line of recovery focus on how businesses and local economies can survive in the short-term and thrive in the long-term. Building on existing economic strengths and opportunities with a focus on tourism, primary producers, small businesses, medium and large business, industry and sectors is critical. This line of recovery also captures opportunities for strategic investment in regional infrastructure to boost economic recovery and future development.

DEECA is the coordinating agency for recovery activities relating to agriculture. DJSIR is the coordinating agency for recovery activities relating to businesses and local economies. DGS/Local Government Victoria works closely with municipal councils to implement appropriate actions and initiatives that encourage and bring forward the resumption of local economic activity.

Buildings and infrastructure

Residential, commercial, and agricultural buildings are often damaged or destroyed in emergencies. Similarly, essential utilities and infrastructure such as running water, electricity, roads, and community facilities can all be damaged, destroyed or impacted during emergencies. There are also significant state-owned assets, such as schools, health facilities and emergency management facilities that can require repair and restoration following emergencies.

This line of recovery seeks to address loss in the built environment and to restore essential community infrastructure safely and quickly. Some of the desired outcomes are to ensure utilities and transport routes are restored and resilient and public infrastructure is relevant and of high-quality– this could include factoring in Victoria's future climate when rebuilding damaged infrastructure.

DEECA is the lead coordinating agency for recovery activities relating to energy services, public land assets and water and wastewater services. DGS leads coordination of recovery activities for public communications. DTP is the lead coordinating agency for recovery activities relating to transport.

3.7.3 Coordination

Recovery activities will be undertaken in accordance with the SEMP and will commence during the response phase. As such, high levels of understanding and cooperation are required between response and recovery organisations at each operational tier (state, regional, municipal) and each recovery environment and activity. Response and recovery activities may need to be managed concurrently in some areas impacted by an earthquake.

As highlighted in 3.7.1, coordination is a key element for the transition to recovery to ensure roles, responsibilities and messaging is clear and consistent.

Recovery coordination responsibilities are outlined in the 'Roles and Responsibilities' section of the SEMP, and include:

- For state recovery coordination: ERV.
- For regional recovery coordination: ERV.
- For municipal recovery coordination: Municipal councils.

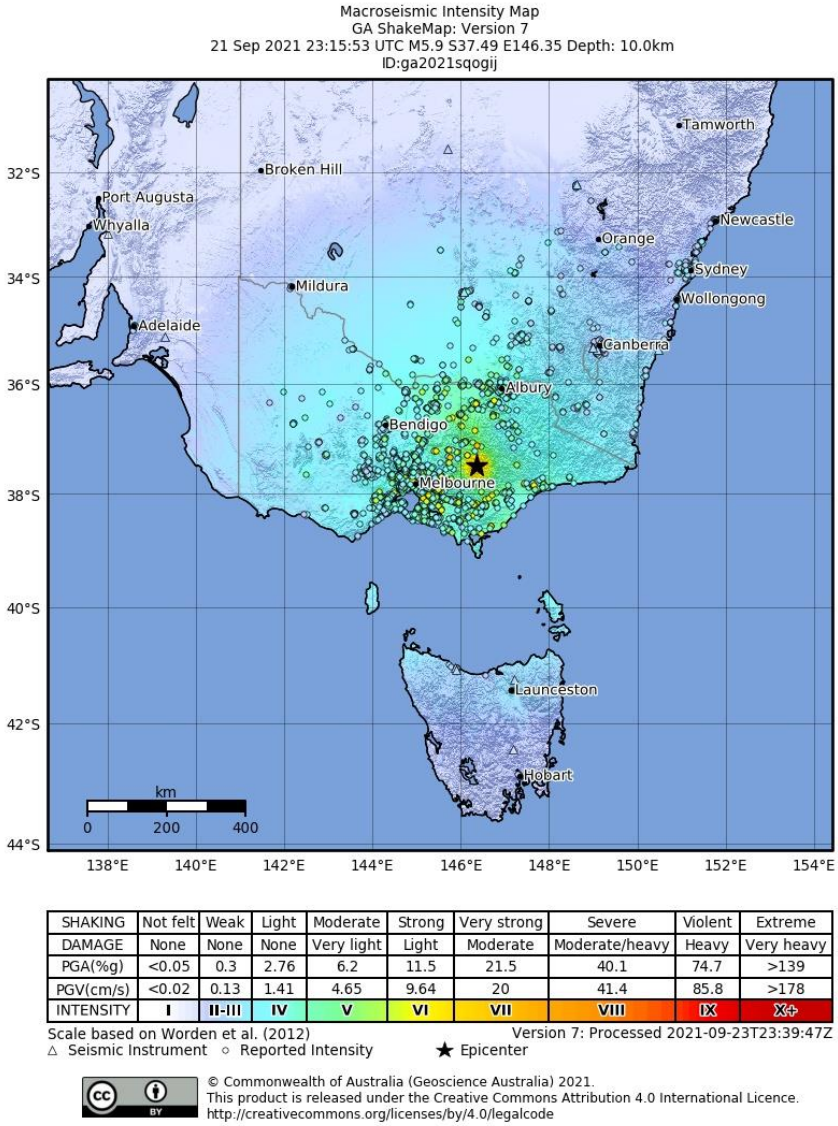
Appendix

APPENDIX 1

History of damaging earthquakes in Victoria within the last 40 years

Most Significant Earthquakes – Victoria:

Date	Event	Location	Details
1984	M5.4	Bright	○
1987	M4.9	Nhill	○
1996	M5.2	Mt Baw Baw	○ Shock was felt up to 100km away. ○ Minor damage reported in Melbourne.
August 2000	M5.0	Boolarra	○ Caused minor damage and felt throughout Gippsland.
6 and 18 March 2009	M4.6	Koumburra	○ Korumburra experienced two earthquakes within two weeks of each other, both recorded at M4.6.
June 2012	M5.3	Latrobe Valley, Gippsland	○ The earthquake caused minor damage. ○ The epicentre was 16km southwest of Moe and was the strongest earthquake recorded since the 1982 Wonnangatta Valley earthquake. ○ It was felt across the state including Melbourne and as far away as Wodonga.
17 September 2015	M4.8	Sea-Based – Near King Island	○ 120km west of King Island ○ Felt by residents of King Island and Victoria's Southwest Coastline ○ A "No Threat Tsunami" Warning was issued for Australia
22 September 2021	M5.9	Alpine National Park, south-east of Mansfield	○ Depth of 10km detected. ○ The epicentre was in a largely unpopulated location approximately 130km northeast of Melbourne. ○ 9 aftershocks occurred within 24 hours. ○ Over 40,000 felt reports were recorded; some of which were from the Australian Capital Territory, South Australia, and Tasmania. ○ Approximately 35,000 households and businesses experienced power outages and 90 sets of traffic lights were offline, but triple zero communications were not disrupted. ○ Major damage observed to unreinforced masonry building on Chapel Street. ○ Minor building damage occurred in the Melbourne areas of Kensington, Ascot Vale, Parkdale, Prahan, Balwyn, Elsternwick, Northcote and West Melbourne. ○ In Mansfield, an Ambulance Victoria dispatch bay reported some damage and some fallen trees observed on roads. ○ In Prahan, one Coles supermarket was temporarily closed due to risks of falling facades. ○ Intensity ShakeMap – *See Below*



*** For the intensity Shake details of a particular earthquake:**
go to: https://earthquakes.ga.gov.au/ - select: date of earthquake – select: State – select: search – Click on: the earthquake – select Dropdown: ShakeMap, FeltGrid and other download - Click on Intensity ShakeMap PDF or JPG

While Victoria is not immune from damaging earthquakes causing significant human and economic loss, it is important to recognise Australia's most significant earthquake in this time scale.

Most significant earthquake – Australia wide:

Date	Event	Location	Details
28 December 1989	M5.6	Newcastle	○ Caused damage to over 35,000 homes, 147 schools, 3000 commercial and/or other buildings. ○ Killed 13 people. ○ Hospitalised 120 people.

APPENDIX 2

Multi Agency Incident Management Structure - high impact earthquake