Central Region

EMERGENCY RESPONSE PLAN

Earthquake Sub-Plan

Published by Victoria State Emergency Service

Melbourne, August 2018

This publication is intended to be consistent with the State Emergency Response Plan (SERP), published by Emergency Management Victoria in 2016.

Authorised by the Victoria State Emergency Service
168 Sturt Street, Southbank

An electronic version of the plan can be obtained at: www.ses.vic.gov.au

Version Control
Central Region
Emergency Response Plan– Earthquake Sub-plan
Version 7.4, August 2018

Central Region Emergency Response Plan – Earthquake Sub-plan Certification

The Central Region Emergency Response Plan – Earthquake Sub-plan deals with response to earthquake incidents within Central area of responsibility.

The following plan is intended to provide the framework for Central Region to effectively and efficiently respond to future emergencies caused by earthquakes, and will remain current until rescinded by authority of the Victoria State Emergency Service Chief Officer Operations.

_____ Date: _____

Tim Wiebusch

Chief Officer Operations

This plan is produced by Victoria State Emergency Service and has been adapted from the State Emergency Response Plan – Earthquake Sub-plan. All information contained in this plan was current at time of publication.

Victoria State Emergency Service would like to acknowledge the significant contribution of key stakeholders to ensure the content contained within this plan is of a high quality to support response activities.

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State Emergency Management Priorities

The State Emergency Management Priorities are:

- Protection and preservation of life 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 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.

Table of Contents

1. Introduction

1.1 Purpose

The purpose of this plan is to provide strategic guidance for the effective emergency management of an earthquake in Central Region.

1.2 Objective

The objective of the Central Region Emergency Response Plan – Earthquake Sub-plan is to outline the arrangements for ensuring an integrated and coordinated approach to the management of earthquake events in Central Region, in order to reduce the impact and consequences of these events on the community, infrastructure and services.

1.3 Scope

This Central Region Emergency Response Plan – Earthquake Sub-plan includes:

- Description of potential risks and consequences of earthquakes to the social, built, economic and natural environments
- Region specific emergency management arrangements for the management of earthquakes
- Links to sources of information where the reader can obtain further detail.

1.4 Authorising Environment

The Emergency Management Act (1986 and 2013) is the empowering legislation for the management of emergencies in Victoria.

The Emergency Management Manual Victoria (EMMV) contains policy and planning documents for emergency management in Victoria, and provides details about the roles different organisations play in the emergency management arrangements.

The State Emergency Response Plan (Part 3, EMMV) identifies Victoria's organisational arrangements for managing the response to emergencies.

The Central Region Emergency Response Plan (yet to be developed) will detail specific arrangements for the management of emergencies within the Central Region. This plan has been developed as a subordinate plan of the Central Region Emergency Response Plan and the State Emergency Response Plan – Earthquake Sub-plan. This plan has been shared with the Regional Emergency Management Committee for comment, and approved by the VICSES Chief Officer Operations.

Other relevant legislation includes:

- Victoria State Emergency Service Act 2005
- Essential Services Act 1958
- Planning and Environment Act 1989
- Local Government Act 1989.

1.5 Activation of the Plan

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

1.6 Audience

The audience for this plan comprises the Victorian Government and agencies within the emergency management sector, including business and community groups with a significant role in the management of the emergency.

Although the wider community is not the primary audience, community members may find the contents of this plan informative.

1.7 Linkages

This plan is a sub-plan of the State Emergency Response Plan – Earthquake Sub-plan and the Central Region Emergency Response Plan (yet to be developed). It reflects legislation, the arrangements in the State Emergency Response Plan, the strategic direction for emergency management in Victoria and the accepted State practice for managing emergencies.

Arrangements in this plan have not been repeated from aforementioned plans, unless necessary to ensure context and readability. The State Emergency Response Plan – Earthquake Sub-plan can be accessed at www.ses.vic.gov.au

Arrangements for the management of secondary consequences are contained in the following:

- For health response – State Health Emergency Response Plan (SHERP)
- For rescue – the Victorian Urban Search and Rescue Response Arrangement (USAR)
- Flood response resulting from dam failure – State Emergency Response Plan – Flood Sub-plan, and Central Emergency Response Plan – Flood Sub-plan
- Tsunami response – State Emergency Response Plan – Tsunami Sub-plan, and Central Emergency Response Plan – Tsunami Sub-plan.

1.8 Exercising and Evaluation

This plan will be exercised within one year from the date of approval and once every three years thereafter as part of a phased cycle. 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 State Exercising Framework.

Any operational activity in Central Region requiring the management of an earthquake event will be regarded as exercising of the plan. The event is to be evaluated and reviewed, as outlined above.

1.9 Review

This plan was current at the time of publication and remains in effect until modified, superseded or withdrawn.

This plan will be reviewed and updated every three years. Consideration will be given to an earlier revision if the plan has been applied in a major emergency or exercise, or following a substantial change to the relevant legislation or arrangements.

2. The Earthquake Risk within the Central Region

2.1 Region Description

The Central Region of the Victoria State Emergency Service (VICSES) covers 13,000 Square kilometres. Geographically this area is diverse and includes:

- The Melbourne Central Business District (CBD)
- 31 Municipalities
- 4.14 million people from over 151 nationalities
- Approximately 1,600,000 private dwellings and over 2,000,000 habitable dwellings
- Numerous multinational corporate headquarters
- The Greater Melbourne Metropolitan area and surrounds
- Four of the fastest growing population pockets in Australia including the City of Casey, Shire of Melton, Shire of Cardinia, Shire of Hume and the City of Wyndham.
- The majority of the state's road, rail, air and sea transport hubs, including both domestic and international departures and destinations
- Most of the State's major events including the Australian F1 Grand Prix, Melbourne Cup and the AFL final series
- Numerous Major Hazard Facilities (MFH)
- Numerous items of significant community infrastructure including high rise buildings, communication hubs, transport hubs, major road and rail bridges, water and fuel storage facilities and culturally and historically significant sites
- Three Victorian Government Regions including, North West Metro, Eastern Metro and Southern Metro.

2.2 The Earthquake Hazard

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. Earthquakes, unlike many other natural hazards, have the potential to cause catastrophic losses. 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 the relevant township and surrounds. Whilst there is a low probability that this event will occur in the foreseeable future, it is important to recognise the potential for such catastrophic impacts.

Victoria is located away from geologically-active tectonic plate boundaries, which lay hundreds of kilometres seaward of the eastern coastline. However, Victoria regularly experiences small earthquakes that are felt and reported. Stresses and strains develop 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.

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 (M 2.0)

releases about 30 times more energy than a magnitude 1.0 earthquake (M 1.0), while a magnitude 3.0 earthquake (M 3.0) releases 900 times (30x30) more energy than a magnitude 1.0 (M 1.0).

In Australia, seismologists (people who study earthquakes) prefer the use of the moment magnitude scale, which calculates the magnitude of an earthquake based on physical properties such as the area of movement (slip) along the fault plane.

A M 6.0 earthquake can be anticipated for all of Australia, on average, every five years and a M 5.0 earthquake once per year. The probable maximum earthquake magnitude for Australia is approximately M 7.5.

Australia is not immune from damaging earthquakes causing significant human and economic loss, as shown in the list below:

- In 1932, a M 4.5 event caused considerable damage on the Mornington Peninsula
- In 1996 a M 5.2 earthquake was centred near Mt Baw Baw, the shock was felt up to 100 km away with minor damage reported in Melbourne
- In 2009, Korumburra experienced two earthquakes within two weeks of each other on the 6 March and then the 18 March. Both earthquakes were recorded at M 4.6
- In June 2012, a M 5.3 earthquake occurred in the La Trobe Valley, Gippsland. The earthquake caused minor damage. The earthquake epicentre was 16 kilometres southwest of Moe and was the strongest earthquake recorded since the 1982 Wonnangatta Valley earthquake and was felt across the state including in Melbourne and as far away as Wodonga.

2.3 Major Dams with Credible Earthquake Risk

A list and description of major dams located within the Region that have a known credible risk to earthquakes is proved in the table below.

Dam name	Location	Capacity (Megalitres)	Emergency plan available (Y/N)
Beaconsfield	O'Neill Road Officer	912	Y
Frankston	Jeremy Way, Frankston South	680	Y
O'Shannassy	Road 1 McMahons Creek	3,123	Y
Yan Yean	Recreation Rd Whittlesea	33,086	Y

2.4 Regional Resources

Key regional resources that are used for earthquake response include:

- 280 (approx.) Category 1 trained from SES
- 220 Category 2 USAR personnel from MFB, CFA and SES
- 20 (approx.) Category 2 trained Ambulance Victoria paramedics
- Approx. Category 2 trained VICPOL Search and Rescue Squad members
- VICPOL Canine Unit members and dogs
- MFB USAR pod
- MFB Heavy Rescue pod

- MFB High Angle Rescue Team (HART) pod
- 2 x MFB Heavy Rescue Caches (technical search, UAV, Damage Assessment)
- CFA Technical Rescue pod - Trench Rescue
- CFA Technical Rescue pod - Medium Angle Rescue
- Unit boundaries General Response Boundaries are accessible via Emergency Management – Common Operating Picture (EM-COP) for registered users.

Expert multi-agency resources may be accessed during operations through the Australasian Inter-Service Incident Management System (AIIMS) structure. A map of VICSES Unit boundaries are provided in Attachment 1 – VICSES Unit Map or accessible via Emergency Management – Common Operating Picture (EM-COP) for registered users.

3. Consequences

3.1 Possible Earthquake Consequences

The effects of an earthquake depend on many factors, such as the magnitude of the earthquake, its depth and the distance from the epicentre. The below summarises the possible types of damage and disruption that may result in a major earthquake. Detailed information about the effect of earthquakes is contained in the State Emergency Response Plan – Earthquake Sub-plan.

Built infrastructure damage (e.g. buildings) – Information on building critical infrastructure resilience can be found in the Victorian Critical Infrastructure Resilience Strategy available at www.emv.vic.gov.au/our-work/critical-infrastructure-resilience

Casualties – Casualties and injuries are likely to result from large damaging earthquakes. People may also become trapped requiring rescue. 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 damage, people can become displaced requiring temporary accommodation. Areas can become isolated requiring resupply of essential items.

Transport Access – Roads may be blocked as a consequence of debris from fallen buildings.

Trams and trains – Some rail and light rail bridges may be extensively damaged.

Electricity – The complete failure of large power components, such as transformers or substations, may occur in the proximity of the epicentre.

Water supply – Major water facilities such as pumping stations and reservoirs may experience damage. Damage may occur across the network. In case of liquefaction, breakage of pipes is likely to be widespread and concerns over contamination may render the water not suitable to drinking.

Waste water – Extensive damage may occur to waste water systems can occur even without the occurrence of liquefaction.

Communications – Communications infrastructure may suffer damage and be overloaded. Loss of communication can be due to a variety of reasons such as the crashing of telecommunication services, website crashes, and loss of power meaning mobile phones cannot be charged or cordless home phones will not work.

Chemical and high risk industrial plants – 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.

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, poisonous liquids that contaminate the water table. Asbestos may be exposed as a result of earthquake building damage.

Fire following earthquake – Fire following earthquake will likely be localised to high risk sites such as industry.

Long series of aftershocks – A series of aftershocks are possible after an earthquake event and may result in increased damage levels as well as seriously disrupting recovery activities.

Other impacts – Consideration should also be given to: Land or mud slide, Tsunami, Floods from dam and levee failure and subsidence.

3.2 Earthquake History

No notable earthquakes have occurred in the last 50 years with an epicentre in Central Region. Occasionally minor effects in parts of Central Region may result from an earthquake occurring with an epicentre nearby the Central Region boundary, e.g. 19 June 2009 near Moe in Gippsland.

4. Community Resilience

4.1 Shared and Individual Responsibility for Action

The National Strategy for Disaster Resilience, developed by the Council of Australian Governments (COAG), provides high-level guidance on disaster management to agencies with a role in emergency management.

Foremost in the Strategy is the principle of all of society taking responsibility for preparing for disasters. Examples in the context of earthquake include:

- Individuals being aware of their earthquake risk, and following advice from emergency services when responding to warnings
- Local governments and communities including earthquake risk within their Community Emergency Risk Assessment activities, including consideration within emergency management planning and land use planning
- Industry and businesses planning for the risk of disruption, and ensuring arrangements are in place to maintain critical services, and assist communities where possible.

Government agencies undertaking:

- Risk assessments to gain an appreciation of earthquake risk
- Engaging with the community regarding earthquake risk
- Working with communities to plan the management of earthquake risk
- Providing emergency information and earthquake warnings
- Ensuring an effective, well-coordinated response to an earthquake event
- Helping communities to recover and learn following an earthquake and build their resilience to future events.

The Victoria State Emergency Service has developed a Community Resilience Strategy and delivers programs to at-risk communities to provide information on what to do before, during and after earthquakes. Information can be found at www.ses.vic.gov.au/get-ready

4.2 Earthquake Notifications

Earthquake notifications are provided by Geoscience Australia, who analyse and report on earthquakes within Australia and internationally. This is done on a 24/7 basis by Duty Seismologists for the purposes of earthquake warnings and to alert governments, emergency services and the general public of earthquakes in Australia and overseas.

There is no accepted method to predict earthquakes; however, some regions are more prone to earthquakes than others due to their location in proximately to earthquake faults. When an earthquake occurs, Geoscience Australia and the Victoria State Emergency Service will work together to notify the community.

Geoscience Australia monitors seismic data from the Australian National Seismic Network and stations worldwide. This is done in near real-time, 24 hours a day. Seismic data is also freely provided by overseas Governments who have national seismic networks. Geoscience Australia uses data provided by the Governments of New Zealand, Indonesia, Malaysia, Singapore and China. Data from global seismic networks are also provided by USA, Japan, Germany and France.

The seismic data is collected and analysed automatically and then immediately reviewed by Geoscience Australia's Duty Seismologist. For earthquakes that have the potential to generate a tsunami, preliminary earthquake details are computed within 15 minutes. All other earthquakes are generally computed within 30 minutes.

Earthquakes that can be located in Australia are catalogued and published on the Geoscience Australia website. The analysis includes the origin time and date of the earthquake, its location (latitude, longitude and depth) and its magnitude. Earthquakes outside Australia, but within our region, are published only for earthquakes with a magnitude of 5 or greater. Earthquakes occurring anywhere internationally with a magnitude of 6 or greater are also catalogued and published on the Geoscience Australia website at www.ga.gov.au/earthquakes/

4.3 Building Codes

Australia's building codes set out data and procedures for determining earthquake loads on structures and their components, whilst detailing minimum requirements for structures. Local Government is responsible for the application of building code provisions.

4.4 Municipal Emergency Planning

Where earthquake is identified through the emergency risk management process as a priority risk to a community, the Victoria State Emergency Service 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 for the response to an earthquake event based on all-hazards and all-agency response.

4.5 Community Engagement

Community engagement programs to build community resilience for earthquakes are conducted in accordance with the VICSES Community Resilience Strategy, as outlined in section 4.1 Shared and Individual Responsibility for Action.

Programs to build resilience in Central Region include local engagement activities and initiatives. For community information regarding earthquakes go to www.ses.vic.gov.au/get-ready/quakesafe

4.6 Household and Business Plans

The Emergency Management Commissioner advises that every household and business should have the written emergency plan. Information on the development of these plans can be found at www.ses.vic.gov.au

The Central Region also supports local Caravan owners prepare for emergencies by supporting use of the online planning tool which can be found at www.ses.vic.gov.au/get-ready/caravan-park-information

4.7 Community Safety Advice

Victoria State Emergency Service provides advice to community in the form of key safety messages for earthquake including advice for safe evacuation. A full list of community safety advice messages can be viewed online via EM-COP, located in the IMT Toolbox.

5. Managing an Earthquake Event

5.1 Roles and Responsibilities

Roles and responsibilities of agencies involved in responding to earthquakes are detailed in the State Emergency Response Plan – Earthquake Sub-plan.

5.2 Concept of Operations

The concept of operations is detailed in the State Emergency Response Plan – Earthquake Sub-plan.

5.3 Escalation and Notification

Geoscience Australia publishes any earthquake activity, as detailed in section 4.2 Earthquake Notifications, on their public website www.ga.gov.au/earthquakes/ and notifies pre-identified agencies, organisation and media outlets, including pager and email notification message to Victoria State Emergency Service State Duty Officer (SDO).

The Victoria State Emergency Service SDO will acknowledge any Earthquake Notification, confirm details with Geoscience Australia and notify relevant internal personnel, including Regional Duty Officers (RDOs).

Upon receipt of an Earthquake Notification, RDOs will acknowledge the pager message and notify the Regional Agency Commander (RAC) to notify the Regional Controller and/or Regional Emergency Management Team members for earthquake response, and any relevant Units.

The escalation and notification process for earthquake response is operationalised within the Victoria State Emergency Service *Standard Operating Procedure (SOP) 046 – Earthquake Notification and Activation Process.*

5.4 Strategic Response Planning

The actions listed below are the responsibility of Victoria State Emergency Service at the regional and State tiers. Responsibility for these actions may transition to the Regional Controller to support multi-agency response when significant impacts caused by an earthquake event occur.

On receipt of an Earthquake Notification the RAC will undertake strategic level planning. Key considerations will include:

- Establishing the control structure for managing the event
- Supporting consistent emergency warnings and provision of information to the community
- Implementation of evacuation and emergency relief plans and identification of evacuation points
- Confirming agencies at all tiers are activated and appropriate arrangements are in place
- Identifying likely earthquake consequences 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 or international assistance
- Identifying mass gatherings and large public events that maybe at risk, and arrangements to ensure the safety of individuals attending
- Confirming agencies with call-taking responsibilities have resources in place and back up arrangements to cope with the expected call load

- Positioning of Emergency Management Liaison Officers (EMLOs) from key support agencies to Regional Control Centres (RCCs), where appropriate
- Arranging for regular meetings of the Regional Emergency Management Teams (REMTs) and Incident Emergency Management Teams (IEMTs)
- Providing situation reports to the State Control Team (SCT).

5.5 Cross Border Arrangements

For Central Region, arrangements are in place as per the Emergency Management Manual of Victoria (EMMV) for all Victorian Emergency Response Organisations (ESOs) and other agencies will provide support and assistance to SES.

Interstate resources and personnel will also be available as required through Emergency Management Victoria (EMV). Military resources will also be provided, if required, through the current Defence Aid to the Civil Community (DACC) arrangements.

During a significant earthquake event additional Units may be deployed to all SES Regions, with reciprocal arrangements for Units deployed to support Central Region.

5.6 Regional Control Centre

The following pre-determined facilities are suitable for the establishment of a Regional Control Centre (RCC) for the management of earthquake events, including:

- North West Metropolitan Region - CFA District 14 Headquarters, 251 High St, Melton. Mel Ref 337 C9
- Eastern Metropolitan Region – CFA District 13 Headquarters, 16 – 18 Lakeview Drive, Lilydale. Mel Ref 38 G10
- CFA District 8 – Dandenong South ICC, L3, Building G, Eastgate One Business Park, 45 Assembly Dve, Dandenong South

A map of RCC footprints can be viewed in Attachment 5 – Regional Command Centre Footprint Map.

5.7 Incident Control Centres

Incident Control Centres (ICCs) will be activated in accordance with the requirements of the relevant Regional Controller(s) and the State Response Controller (SRC). Footprints or Areas of Operations for these ICCs will need to be established according to earthquake damage and availability and access to these facilities. Locations of ICCs for earthquake response are detailed in the table below.

Name	Location	Local Government Area (LGA) within footprint
Dandenong ICC	CFA District 8 - L3 Building G Eastgate One Business Park, 45 Assembly Drive, Dandenong Sth	To be determined by RC(s) & SRC
Burnley ICC	MFB Burnley, 450 Burnley St, Richmond	To be determined by RC(s) & SRC
Sunshine ICC	SES Central Region, 239 Proximity Drive, Sunshine West 3020	To be determined by RC(s) & SRC
Ferntree Gully ICC	Unit 27/69 Acacia Road, Ferntree Gully 3156	To be determined by RC(s) & SRC
Kangaroo Ground	35 Kangaroo Ground-St Andrews Road,	To be determined by

ICC**	Kangaroo Ground 3097	RC(s) & SRC
Woori Yallock ICC**	7-9 Symes Road, Woori Yallock Victoria 3139	To be determined by RC(s) & SRC
ICC – Gisborne (Owner – Loddon Mallee Region)**	Nexus Centre, L2 10-14 Prince Street, Gisborne, Vic, 3438.	To be determined by RC(s) & SRC

** to be considered as redundant ICC sites should other ICCs become unavailable or unserviceable to due to earthquake damage.

A map of ICC footprints is available online via EM-COP.

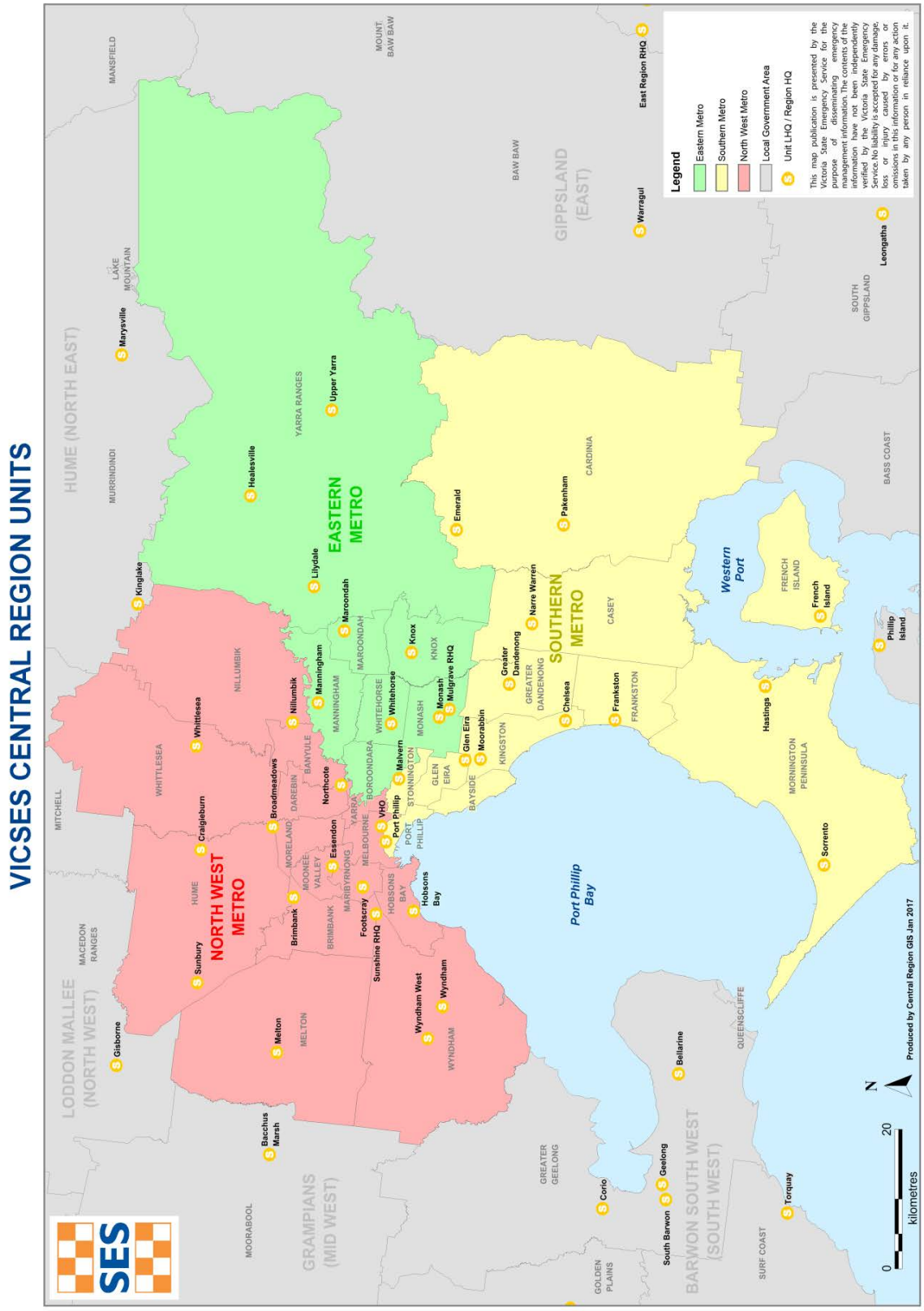
5.8 Divisional Command Points

Facilities suitable for use as Divisional Command Points (DCPs) are listed in the table below.

Location	VICSES Units within footprint	Local government areas within footprint
Wyndham West Unit / Brimbank Unit	Sunbury, Melton, Brimbank, Footscray, Hobsons Bay, Wyndham, Wyndham West	Hume (part), Brimbank, Maribyrnong, Hobsons Bay, Wyndham
Broadmeadows Unit / Essendon Unit	Craigieburn, Whittlesea, Nillumbik, Northcote, Broadmeadows, Essendon	Hume (part) Whittlesea, Nillumbik, Moonee Valley, Moreland
Knox Unit	Knox, Maroondah, Lilydale, Healesville, Upper Yarra	Yarra Ranges, Maroondah, Knox
Glen Eira Unit / SES Victorian Head Office (VHO)	Manningham, Whitehorse, Malvern, Monash, Glen Eira	Manningham, Whitehorse, Boroondara, Stonnington, Monash, Glen Eira
Pakenham Unit	Emerald, Greater Dandenong, Narre Warren, Pakenham	Greater Dandenong, Casey, Cardinia
Frankston Unit	Port Phillip, Chelsea, Moorabbin, Frankston, Hastings, Sorrento	City Of Melbourne, Frankston, Kingston, Mornington Peninsula, Bayside

A map of DCPs can be viewed in Attachment 3– Division Command Point Location Map.

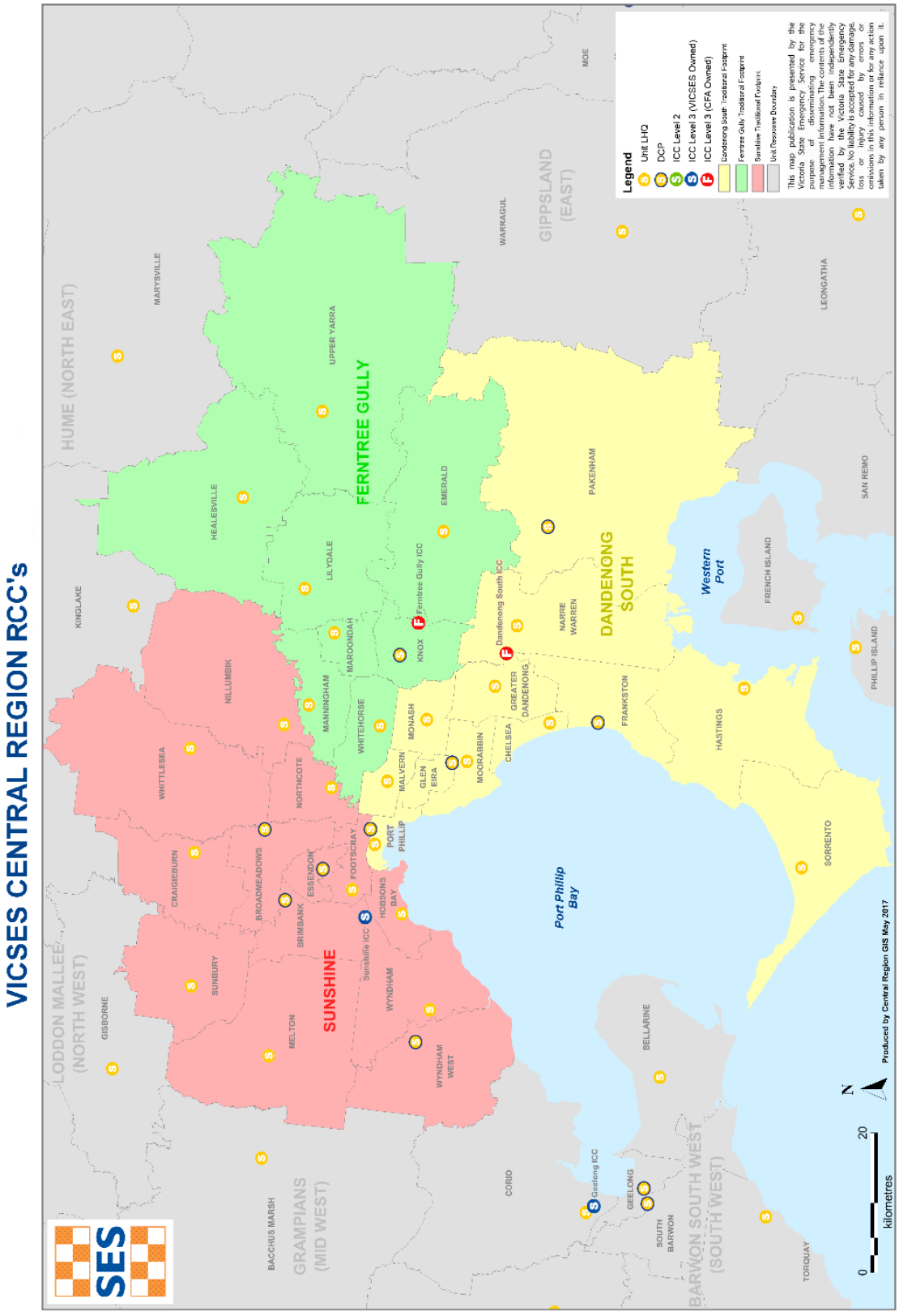
Attachment 1 – VICSES Unit Map



VICSES Central Region Unit Map

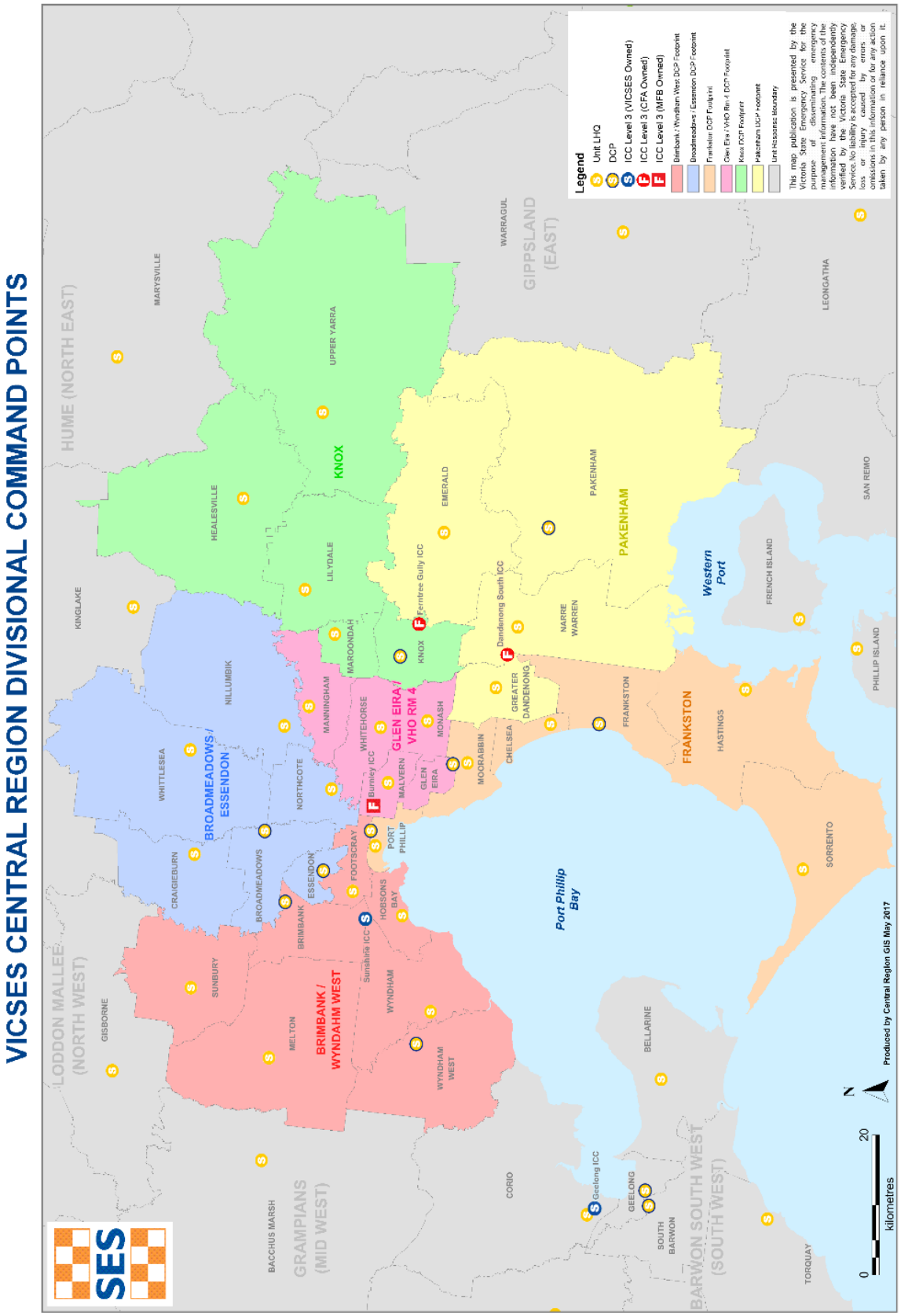
Map source: MapInfo

Attachment 2 – Regional Control Centre Footprint Map



VICSES Central Region – Regional Control Centre (RCC) Map Map source: MapInfo

Attachment 3 – Divisional Command Point Location Map



VICSES Central Region – Divisional Command Point Location Map Map source: MapInfo