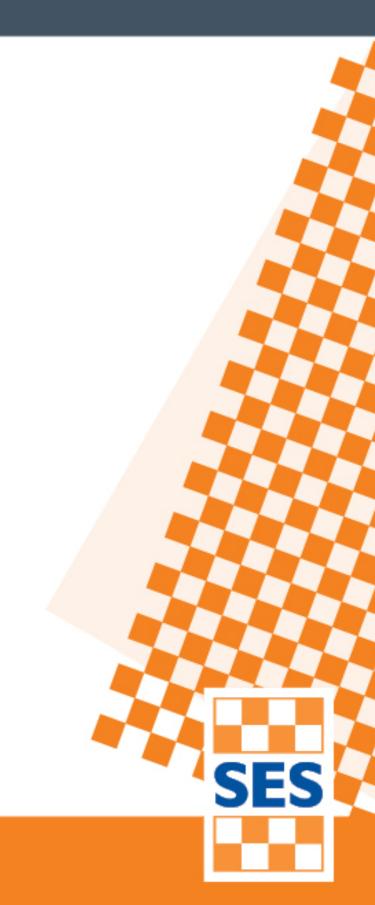
Central Region

EMERGENCY RESPONSE PLAN



Flood Sub-Plan





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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 – Flood Sub-plan Version 7.04, 1st August 2018



Central Region Emergency Response Plan – Flood Sub-plan Certification

The Central Region Emergency Response Plan – Flood Sub-plan deals with response to flood 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Region to effectively and efficiently respond to future emergencies caused by floods, and will remain current until rescinded by authority of the Victoria State Emergency Service Chief Officer Operations.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 – Flood 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.



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1. Introduction

1.1. Purpose

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

1.2. Objective

The objective of the Central Region Flood Emergency Response Plan is to outline the regional arrangements for ensuring an integrated and coordinated approach to the management of flood events across 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 – Flood Sub-plan includes:

- Description of potential risks and consequences of floods to the social, built, agricultural and natural environments within the Central Region
- Regional specific emergency management arrangements for the management of floods
- 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 Emergency Response Plans applicable to Central Region (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 – Flood 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 – Flood Sub-plan and the Emergency Response Plans applicable to Central Region (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.

This plan outlines regional response arrangements which impact arrangements detailed in Municipal Flood Emergency Plans developed at Municipal level and are also subordinate plans to Municipal Emergency Management Plans. It is likely that flood events will occur in conjunction with severe weather. For arrangements regarding management of severe weather events, refer to the State Storm Sub-plan and Central Region Storm Sub-plan at www.ses.vic.gov.au

Arrangements within this plan have not been repeated from the fore mentioned plans, unless necessary to ensure context and readability. All available Victoria State Emergency Service Plans can be accessed at www.ses.vic.gov.au, and more information on Municipal Flood Emergency Plans can be accessed by respective council websites or as outlined in section 4.5 Municipal Flood Planning.

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

- Health response State Health Emergency Response Plan (SHERP)
- Rescue Victorian Urban Search and Rescue Response Arrangements (USAR)
- Coastal flood response State 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. Region Flood Scenarios have been created to support this function available in Attachment 1 – Region Flood Scenarios. Exercises 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 a flood 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 Flood 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 Flood Hazard

Flooding may be defined, as an overflowing or influx of water from its normal confines onto land not usually submerged. Within the Central Region the following mechanisms may cause flooding:

Heavy rainfalls, which cause runoff to enter watercourses, overtopping the banks of rivers and creeks, overflowing lakes, detention basins and stormwater drains, causing local overland flooding, or resulting in releases or spills from dams. Many factors contribute to the extent and nature of flooding caused by heavy rainfall such as the amount and duration of rainfall, the spatial distribution of rainfall, prior weather conditions and characteristics of a catchment including its size, shape, soil types, vegetation and land use. The characteristics of a river also influence the extent of flooding. These characteristics include the size and nature of the river, the presence of vegetation in and around the river, flood control structures and embankments that may restrict floodwater and downstream river levels¹

¹ Queensland Government (2011) Understanding floods: Questions and Answers. [Available Online]



- Storm surges, which involve the temporary raisings of sea levels above the astronomical tide. These are caused by deep low-pressure systems located off the coast and result in sea water invading low-lying areas along the coast
- Tsunami, resulting from undersea earthquakes, landslides, meteorite impacts or volcanic activity. The arrangements for the emergency management of tsunami are contained in the State Tsunami Sub-plan
- Dam failure, which involves the failure of a dam structure. There are a number of significant dams throughout Victoria that both store and provide water to communities across the State which have the potential to cause flooding in the event of failure. However, there are dam safety risk management processes in place and the possibility of dam failure is considered low but consequences could be catastrophic in some circumstances
- Levee failure, which involves the failure of a levee structure. There are a large number of levees across Victoria, created to redirect flood water to minimise impacts of flooding. Levee failure can result from poorly created and / or maintained levee structures or overtopping of levee structures due to significant water flows exceeding the structures capacity.

Intense heavy rainfall over a short period of time (less than 6 hours) can cause flash flooding to occur within minutes to hours. Flash flooding typically occurs in small catchments. As there is little warning time, flash flooding is difficult to predict and manage. In larger catchments, floods can occur over several days to weeks, and are easier to forecast and manage.

In the CERA Findings report 2016/2017, flooding in riverine areas was identified to be of a High risk for the Cardinia and Hobsons Bay council areas. These two areas have experienced significant flooding events along the rivers.

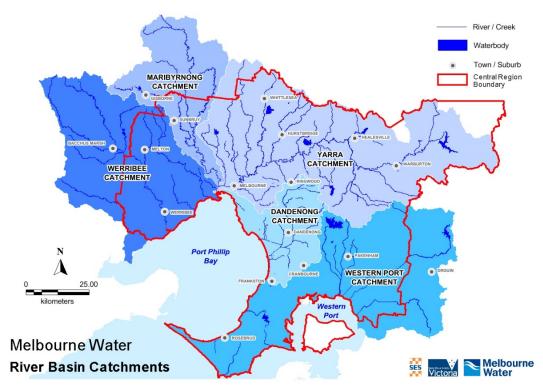
Storm damage (including the consequential flash flooding) was identified as an extreme risk in the City of Port Phillip and High risk for the Banyule, Boroondara, Brimbank, Casey, Darebin, Glen Eira, Hume, Kingston, Knox, Manningham and Monash council areas. In these cases the primary concern for damage and risk to the community was caused by rapid onset flash flooding.

A map of hot spot areas susceptible to 1% probability of flooding in the Central Region is provided in Attachment 2 – Flood Risk Hotspots.

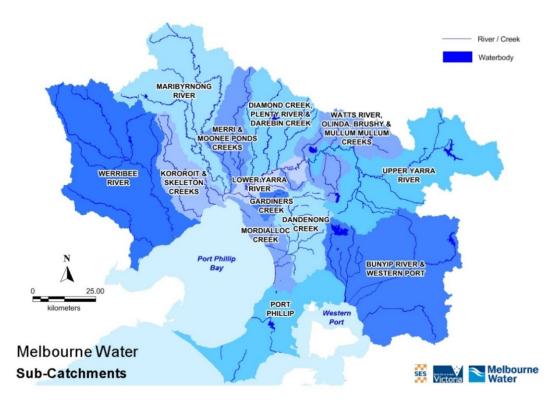


2.3. Central Region Catchments and Catchments Schematics

The map below identifies the five major catchments contained within the Central Region response area.



The map below identifies the associated Sub-catchments within the Central Region response area. More detailed maps of Sub-catchments are available in Attachment 3 – Sub-catchment Maps.





Catchment schematics for each of the Central Region catchments are also included in Attachment 4 – Catchment Schematics. Catchment schematics are also available online for registered users of FloodZoom, available via www.floodzoom.vic.gov.au



2.4. Region Flood Risks

Urban flood risks are predominantly due to rapid onset/flash flooding and occur across the whole of the Metropolitan area.

A number of higher risk areas have been identified and have had Local Flood Guides (LFGs) developed to provide information about the flood risk to local community members. A full list of LFGs for Central Region is provided below or is accessible via www.ses.vic.gov.au/get-ready/your-local-flood-information:

- Aberfeldie (Moonee Valley)
- Altona & Seaholme (Hobsons Bay)
- Balaclava and St Kilda (Port Phillip)
- Blind Creek (Knox)
- Casey (Casey)
- Diamond Creek (Nillumbik)
- <u>Eltham</u> (Nillumbik)
- Elwood (Port Phillip)
- Fairfield (Darebin)
- Glen Iris (Boroondara)
- <u>Hawthorn</u> (Boroondara)
- Healesville (Yarra Ranges)
- Koo We Rup (Cardinia)
- <u>Lilydale</u> (Yarra Ranges)
- Laburnum / Blackburn (Whitehorse)
- Manningham (Manningham)
- <u>Maribyrnong</u> (Maribyrnong)
- Melbourne (City of Melbourne)
- Melton West (Melton)
- Monash (Monash)
- Moonee Valley (Moonee Valley)
- Moonee Valley-Ascot Vale (Moonee Valley)
- Mooroolbark (Yarra Ranges)
- Pakenham (Cardinia)
- Seaholme & Altona (Hobsons Bay)
- Upper Ferntree Gully (Knox)
- Warburton (Yarra Ranges)
- Whitehorse (Whitehorse)
- Yarra Glen (Yarra Ranges)
- Yarra Junction (Yarra Ranges)

Rural flood risks are summarised in the table below.

Area	Description of flood risk
Koo Wee Rup	Flood plains inundated due to overtopping of canal system. Usually for short duration <3 days
Healesville/Yarra Glen	Flood plains inundated due to peak flows in the Watts River / Yarra River.
	Minimal issues to houses.
Werribee	Flood plains inundated due to peak flows/storm surge on Werribee River



Due to the topography of Central Region and the extensive road infrastructure that connects communities, there are no communities that are considered to be at risk of isolation caused by flooding.

2.5. Major Dams

Victoria State Emergency Service, while not responsible for dam management, is responsible for the response to the flooding caused by dam failure – when water overflows dam walls.

All major dams within the Central Region response area (refer to table below) are managed by Melbourne Water who hold and maintain Emergency Flood Plans, with the exception of one dam which has been noted as being privately managed.

A list and description of major dams located within the Region is provided in the table below.

Dam name	Location	Capacity Megalitres
Cardinia	Emerald	286,911
Toorourrong	Whittlesea	-
Greenvale	Greenvale	26,839
Devils Bend	Hastings	573
O'Shannassy Reservoir	McMahons Creek	3,123
Upper Yarra Dam	Reefton	200,579
Maroondah	Healesville	22,179
Melton Reservoir	Melton	-
Silvan	Silvan	40,445
Sugarloaf	Christmas Hills	96,253
Yan Yean	Whittlesea	30,266
Muratore's Dam*	Gilderoy	4500*
(privately owned)		

2.6. Levee Management

There are no major levee systems existing within the Central Region. Individual Municipal Flood Emergency Plans should be consulted regarding the location, size and affected areas of local flood levees. The list of levees has been identified across the region. Local MFEP's should be consulted for further details. See Attachment 5 – Levee Locations.

2.7. Regional Resources

A list of regional resources available within the Central Region can be accessed at Attachment 6 – Regional Resources.

Additional expert multi-agency resources may be accessed during operations through the Australasian Inter-Service Incident Management System (AIIMS) structure. A map of VICSES Unit locations and relevant response boundaries are provided at Attachment 7 – Unit Location Map, in addition to a table identifying VICSES Units and associated Municipalities impacted by key Waterways in Central Region.

Please note, VICSES Units and associated response boundaries are also accessible via Emergency Management – Common Operating Picture (EM-COP) for registered users.



3. Consequences

3.1. Possible Flood Consequences

The Central Region has many flood prone communities. The effects of flooding on the community can include:

- Inundation of properties
- Damage to essential infrastructure, public and private assets and property
- Inundation of farmland, damage to crops and loss of livestock and fodder
- Short or long term displacement of people
- Isolation of properties or communities
- Disruption to essential services
- Death and injuries.

Significant community disruption can occur as a result of damage to essential infrastructure, which may lead to cascading secondary consequences. For example a loss of power may result in a loss of telecommunications, traffic signals and disruption to supply chains amongst other impacts. Damage and flooding of road infrastructure may result in isolation of properties and/or communities.

3.2. Flood History

The table below provides information about historical floods within the Central Region when one or more of the consequences listed above occurred.

Year	Catchments impacted	Description	
February 2005	Westernport Yarra Dandenong	Heavy rain with totals exceeding 150mm, wind gusts of 148km/h along Mornington Peninsula causing extensive damage to buildings with over 7000 RFA's received. An associated high tide put the Yarra River in an ARI 20 (1:20 year flood), Dandenong Creek at Police Rd recorded a 1:40 year event. Costs of \$216m	
February 2006	Yarra	Localised flooding in the Northcote and Coburg areas saw 75.2mm of rain falling in 30 minutes.	
March 2010	Dandenong	Severe thunderstorms bringing isolated severe wind gusts, hail measuring up to 10cm, widespread flash flooding with major infrastructure damaged. 7500 RFA's with a cost of \$1.4b	
February 2011	Westernport Dandenong Yarra,	Severe thunderstorms associated with Tropical Cyclone Anthony and due to the extremely high humidity, rain caused flash flooding and prompted 24 flood warnings for rivers and creeks in metropolitan Melbourne. Wind speeds of 131km/h in 6 minutes caused widespread damage. 6000 RFA's with a cost o \$370m	
September 2011		Melbourne recorded wettest September day since 1916 with more than 48mm falling within 24hrs. Electrical storm disrupted essential services, public transport and left over 30,000 homes without power.	
December 2011	Werribee Dandenong Yarra Maribyrnong	Christmas day thunderstorms, 92mm of rain within 24hrs. Over a 7hr period 5 long lived super cells moved eastward across the Northern suburbs, two tornadoes were reported. 6800 RFA's received with costs in the vicinity of \$750 million.	



May 2013 Yarra		Melbourne faced heavy rain and thunderstorms; Melbourne	
	Dandenong	Airport had 10mm of rain in 10 minutes just after 9pm.	

4. Community Resilience

4.1. Shared and Individual Responsibility for Action

The National Strategy for Disaster Resilience, developed by the Council of Australian Governments, 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 flooding include:

- Individuals being aware of their flood risk, and following advice from emergency services when responding to warnings
- Local governments and communities including flood 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 flood risk
 - Engaging with the community regarding flood risk
 - Working with communities to plan the management of flood risk
 - Providing emergency information and flood warnings
 - Ensuring an effective, well-coordinated response during floods
 - Helping communities to recover and learn following a flood and build their resilience to future events.

The Central Region has developed and delivers a range of programs to achieve the goals outlined in 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 floods. More information can be found at www.ses.vic.gov.au/get-ready

4.2. Flood Warning Services

Flood warnings and notifications are provided by the Bureau of Meteorology, Melbourne Water and Victoria State Emergency Service to the Victorian community. The flood warning services provided by the Bureau of Meteorology is dependent on local infrastructure, including flood gauges. The service is documented in the Service Level Specification for Flood Forecasting and Warning Services for Victoria which can be accessed at www.bom.gov.au/vic/flood/ and a map of flood gauges for the Central Region can be seen at Attachment 8 – Regional Flood Gauge Map.

Victoria State Emergency Service provides warnings and emergency information to the community by publishing Flood Community Notifications using Emergency Management – Common Operating Picture Public Publisher (EM-COP Public Publisher) on the VicEmergency website via www.emergency.vic.gov.au/respond/



Flood Community Notifications are informed by the Bureau of Meteorology, Melbourne Water and local information and intelligence.

4.3. Melbourne Water Flood Management Strategy

Melbourne Water's Flood Management Strategy – Port Phillip and Westernport outlines how flood management agencies will work together to manage flood risks and increase community preparedness. It is aligned with the Victorian Floodplain Management Strategy, emergency management arrangements and planning policy. The strategy is available at www.melbournewater.com.au/yourfloodstrategy

The flood strategy builds on the work of the previous strategy from 2007 and adds new emphasis on:

- Collaboration with the community and all organisations a flood management role
- Climate change and planning for future risks
- Enhanced transparency around decision making
- Improving information on different kinds of flood risk
- Applying the right mix of solutions to achieve the best social, economic and environmental outcomes.

4.4. Flood Intelligence

Flood intelligence supports decision making and planning for flooding by providing reliable and accurate information relating to:

- The level, depth and velocity of floodwater and its consequences
- Determination of actions to be undertaken in response to the identified consequences.

The Victoria State Emergency Service works closely with Catchment Management Authorities, Department of Environment, Land, Water and Planning, other agencies and trusted local sources to ensure available resources and platforms containing flood information and intelligence are utilised.

The Department of Environment, Land, Water and Planning (DELWP) maintains FloodZoom, which the Victorian flood intelligence platform. FloodZoom is a web based platform which assists the Victoria State Emergency Service and other emergency services agencies identify the possible local consequences of flooding and supports CMA's in land use planning and flood risk assessments.

Emergency Management Victoria (EMV) maintains the online multi-agency operational platform, Emergency Management – Common Operating Picture (EM-COP) used for sharing flood intelligence with the sector, before, during and after flood emergencies.

There are no flood wardens in place in Central Region.

4.5. Municipal Flood Planning

Municipal Flood Emergency Planning is managed by Municipal Emergency Management Planning Committees. Municipal Flood Emergency Plans are created by Municipalities that are considered to have a high susceptibility to flooding. Municipal Flood Emergency Plans can be found online at respective council websites, FloodZoom for registered users, and on the Victoria State Emergency Services website at www.ses.vic.gov.au



All municipalities within Central region have completed Municipal Flood (and Storm) Emergency Plans. These are also available through municipal websites if published online.

4.6. Community Engagement

Community engagement programs to build community resilience for flooding are conducted in accordance with the VICSES Community Resilience Strategy, as outlined in section 4.1 Shared and Individual Responsibility for Action. Programs include local engagement initiatives such as the development of a series of local flood guides that provide information of local flood risks to specific communities. These guides can be found at www.ses.vic.gov.au/get-ready

Additional Central Region engagement activities and programs include doorknocks, stakeholder engagement and other activities as per the Melbourne Water Flood Management Strategy.

4.7. Household and Business Plans

The Emergency Management Commissioner advises that every household and businesses should have the written emergency plan. Information on the development of household and business 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

4.8. Community Safety Advice

Victoria State Emergency Service provide advice to community in the form of key safety messages for minor, moderate and major flooding 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 a Flood Event

5.1. Roles and Responsibilities

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

5.2. Concept of Operations

The concept of operations for responding to floods are detailed in the State Emergency Response Plan – Flood Sub-plan.

5.3. Escalation and notification

The Bureau of Meteorology publishes Flood Watches and Warnings, as detailed in section 4.2 Flood Warning Service, on their public website www.bom.gov.au and provides them to pre identified agencies, organisations and media outlets, including pager and email warning messages to Victoria State Emergency Service at the State and Regional Level.

Upon the receipt of a warning, the Regional Duty Officer (RDO) will notify the potentially affected and/or affected communities by issuing Flood Community Notifications, and the Regional Agency Commander (RAC) will notify the Regional Controller and/or Regional Emergency Management Team members for flood response.

The escalation and notification process for flood response is operationalised within the Victoria State Emergency Service Standard Operating Procedure (SOP) 009 – Flood 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 a flood event occur. Associated flood readiness levels and ICC footprints can be accessed within JSOP 2.03 Incident Management Team (IMT) Readiness Arrangements or the VICSES Flood Readiness and Activation Trigger Considerations (v3.0), also available via Attachment 9 – IMT Readiness Levels – Flood .

On receipt of advice from the Bureau of Meteorology of the potential for significant flooding the Regional Agency Commander will undertake strategic level planning in anticipation of an event. Key considerations will include:

- Establishing the control structure for managing the event
- Provision of warnings and emergency information to the community
- Preparations for possible evacuations including implementation of evacuation and emergency relief plans and identification of evacuation points
- Confirming agencies at all tiers are activated and appropriate response arrangements are in place
- Identifying the likely consequences of the flood 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
- Ensuring that flood mitigation structures have been checked and any issues identified
- 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 from key support agencies to the State Control Centre and Regional Control Centres, where appropriate
- Arranging for regular meetings of the Regional Emergency Management Teams and Incident Emergency Management Teams
- Providing situation reports to the State Control Team.

5.5. Cross Border Arrangements

For the Central Region, cross border arrangements exist with all surrounding Victorian Government regions, including South West, Mid-West, North West, North East and East Regions.

During significant flood events it is common for additional Units to be deployed to neighbouring Regions, with reciprocal arrangements for Units deployed to support Central Region.

5.6. Regional Control Centre

The Region Response Plan will outline pre-determined facilitates that are suitable for the establishment of a Regional Control Centre for the management of emergency events, including for flood response, in Central Region. These include:

- 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 at Attachment 11 – Control Centre Footprint.

5.7. Incident Control Centres

The Regional Response Plan outlines Incident Control Centre (ICC) locations that have been pre-determined for emergency response, including flood response, in the Central Region. These are detailed in table below.

Location	Emergency service response area	Catchments within footprint
CFA District 8 – Dandenong South ICC, L3, Building G, Eastgate One Business Park, 45 Assembly Dve, Dandenong South	Southern Metro Region Eastern Metro Region	Dandenong Westernport Yarra



SES Central Region Sunshine Office 239 Proximity Drive, Sunshine	North West Metro Region	Werribee Maribyrnong Yarra
West		Talla
MFB Burnley 450 Burnley St, Richmond	Not assigned	Yarra

A map of ICC footprints can be viewed at Attachment 11 – Control Centre Footprint, or is available online via EM-COP.

5.8. Divisional Command Points

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

Location	Local Government Areas (LGAs) within footprint
Wyndham West / Brimbank	Flexible and dependent on the
Broadmeadows / Essendon	event
Knox	
Glen Eira /VHO	
Pakenham	
Frankston	

A map of DCPs can be viewed at Attachment 11 – Divisional Command Location Map.

5.9. Regional Resource Requirements

Resource requirements for significant major flooding within each ICC footprint are not predetermined and will be allocated as required.

Refer to the Victoria Emergency Management Operations Handbook via www.emv.vic.gov.au/publications/victorian-emergency-operations-handbook-2017 for agreed resourcing levels (noting Central Region cover the three Metropolitan regions) and Joint Standard Operation Procedure (JSOP) 3.09 – Resource Request Process (http://files.em.vic.gov.au/JSOP/EMV-JSOP.htm) for guidance on how to place resources requests.



Attachment 1 – Region Flood Scenarios

Region flood scenarios have been developed to support periodic training requirements (outlined in section 1.8), provide opportunity to document anecdotal and/or known flood impacts based on historic events, and provide an indication of the resource requirements and associated gaps for operational response.

The below scenarios are based on likely flood scenarios of varying intensity.

Scenario 1 – Hailstorm event with heavy rain

Severe storms passing directly over Greater Melbourne, bringing lightning, flash flooding, very large hail and strong winds to the state's capital.

The storms brings heavy rain and large hail, which leads to flash flooding, disrupting transport in central Melbourne.

Many residential buildings are damaged, most due to hail and heavy rain. Some major buildings are evacuated including railway stations, several major shopping centres, civic buildings and sporting stadiums. The storms affect a number of sporting events and festivals, many of which are postponed or cancelled. Hail between 2 centimetres and 5 centimetres falls in central Melbourne's whilst in the eastern suburbs hail of up to 10 centimetres is reported.

Melbourne experiences 60 millimetres of rainfall, more than the monthly average of 50 millimetres. Twenty people are treated by paramedics for hail-related injuries at a festival, and many more people suffered minor hail-induced injuries of cuts and bruises.

At least 50 families, likely many more, are relocated to temporary accommodation. Extensive storms and flash flooding also affected Melbourne only weeks beforehand.

Scenario 2 – Riverine Flooding

High intensity rain falls in early summer causing major flooding across much of the western and central parts of Victoria.

Several follow-up heavy rainfall events following a low pressure system, causes repeated flash flooding in affected areas in mid-summer in many of the communities affected by previous flood events.

Many of the towns were previously affected by floods in the previous spring months with thousands of evacuations being called for by the State Emergency Service.

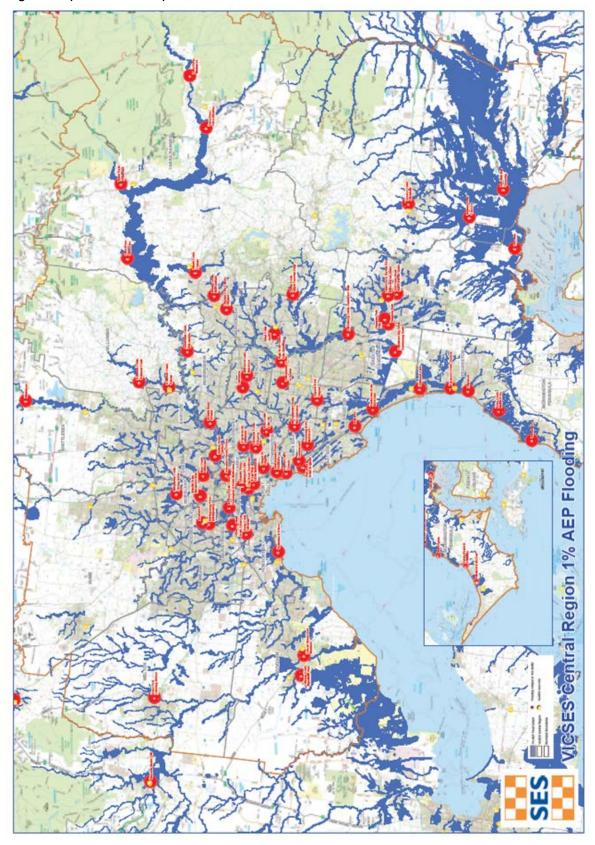
A deepening low pressure trough over south-east Australia is fed with tropical moisture from the monsoon across the state as well as eastern parts of Australia.

During the downpour across the state flash flooding occurred in Melbourne, flooding swells the Yarra River (breaking its banks at South Yarra) and Maribyrnong River; flooding closes roads at Footscray, North Melbourne, Essendon and Maribyrnong resulting in damage to businesses and homes.



Attachment 2 – Flood Risk Hotspots

A map of the areas that are prone to flooding when impacted by 1% AEP flood extent within the Central Region response area is provided below.

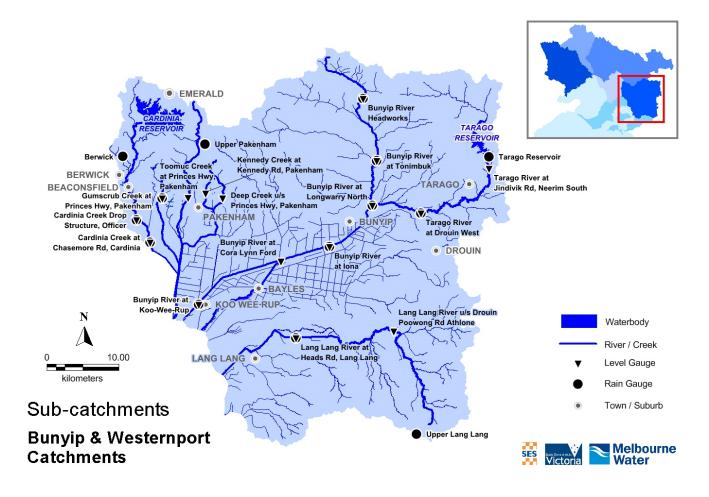




Attachment 3 – Sub-catchment Maps

Maps of Sub-catchments within the Central Region response area are provided below.

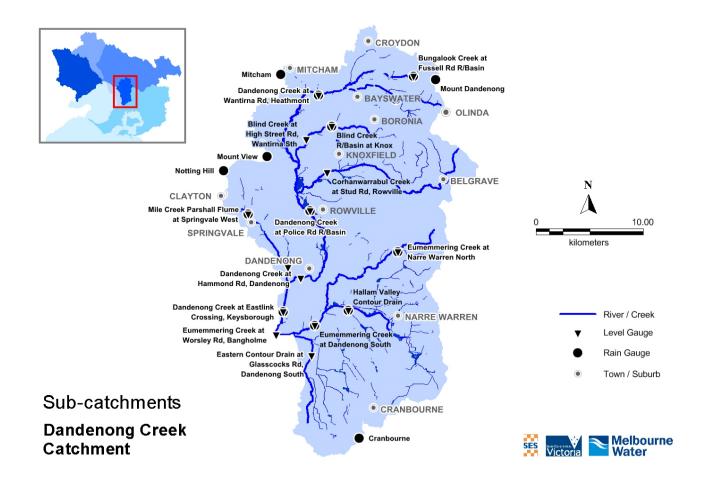
Bunyip River and Westernport Sub-catchment



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Bunyip River	N/A	Cardinia	Pakenham
Cardinia Creek	Cardinia	Casey	Narre Warren



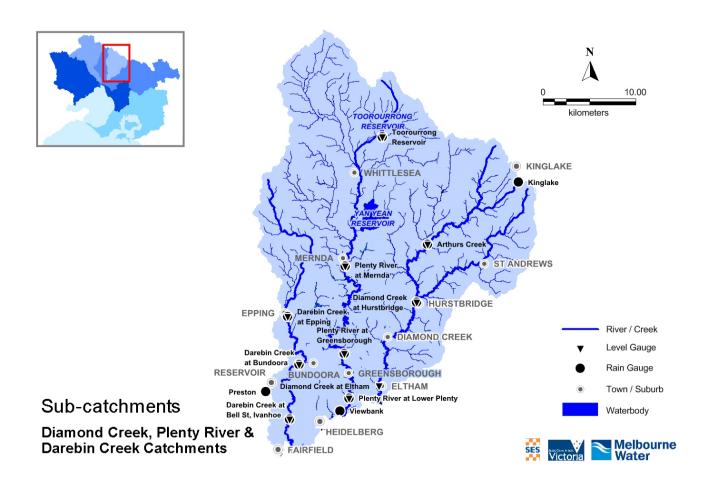
Dandenong Creek Sub-catchments



Key waterways	Reservoir / Storage Area	Municipalities	Central Region Units
	(where applicable)	affected	impacted
Dandenong Creek	N/A	Greater Dandenong	Greater Dandenong
		Casey	Narre Warren
		Knox	Knox
		Cardinia	Pakenham
		Frankston	Frankston
		Yarra Ranges	Lilydale



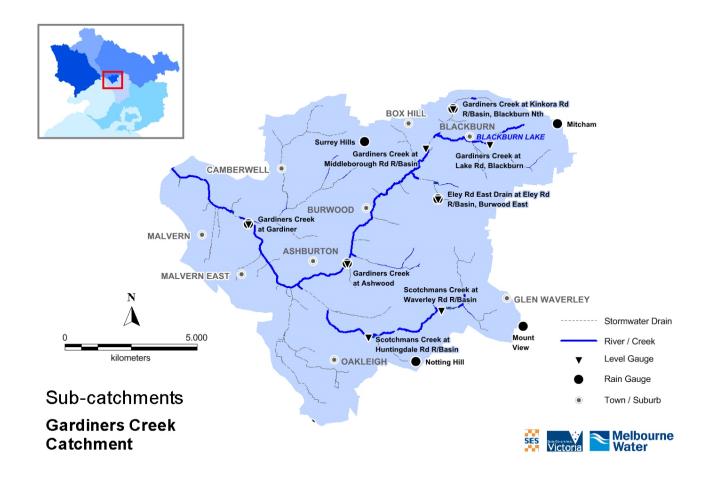
Diamond Creek, Plenty River and Darebin Creek Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Diamond Creek	Torourrong	Nillumbik	Nillumbik
Plenty River		Hume	Craigieburn
Wallaby Creek		Darebin	Broadmeadows
		Moreland	Northcote
			Broadmeadows



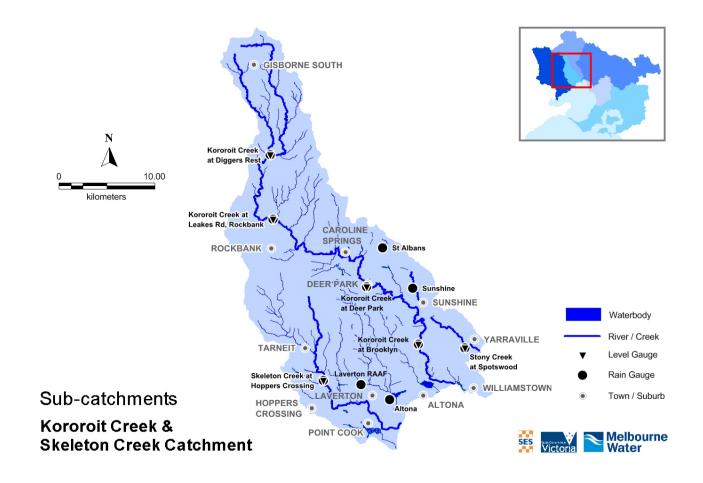
Gardiners Creek Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Gardiners Creek	N/A	Whitehorse	Whitehorse
		Monash	Monash
		Stonnington	Malvern
		Boroondara	Malvern / Whitehorse



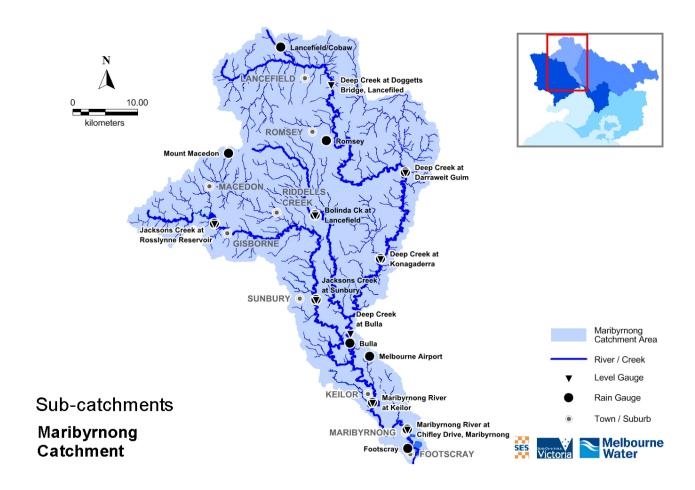
Kororoit Creek and Skeleton Creek Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Kororoit Creek	N/A	Hobsons Bay	Hobsons Bay
Skeleton Creek		Melton	Melton
		Brimbank	Brimbank
		Moreland	Broadmeadows



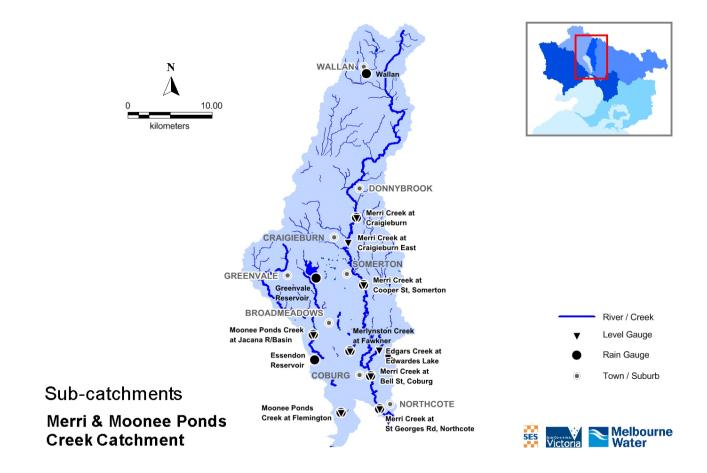
Maribyrnong Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Maribyrnong River	N/A	Brimbank	Brimbank
		Hume	Sunbury
		Maribyrnong	Footscray



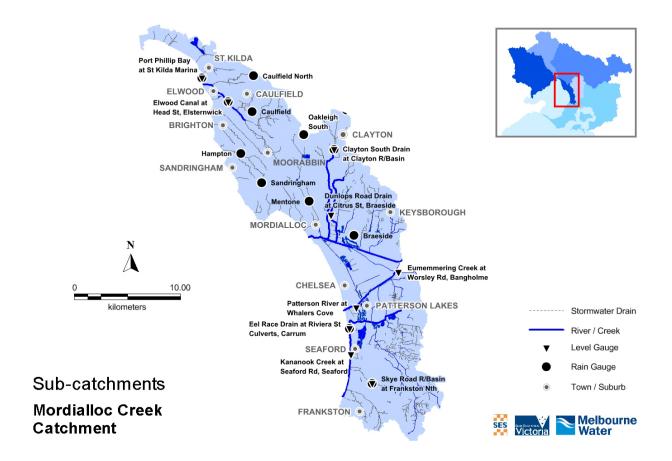
Merri and Moonee Ponds Creek Sub-catchments



Key waterways	Reservoir / Storage Area	Municipalities	Central Region Units
	(where applicable)	affected	impacted
Merri Creek	Greenvale	Hume	Craigieburn
		Darebin	Northcote
		Yarra	Northcote / Footscray
Moonee Ponds	Greenvale	Hume	Broadmeadows
		Moonee Ponds	Essendon
		Maribyrnong	Footscray



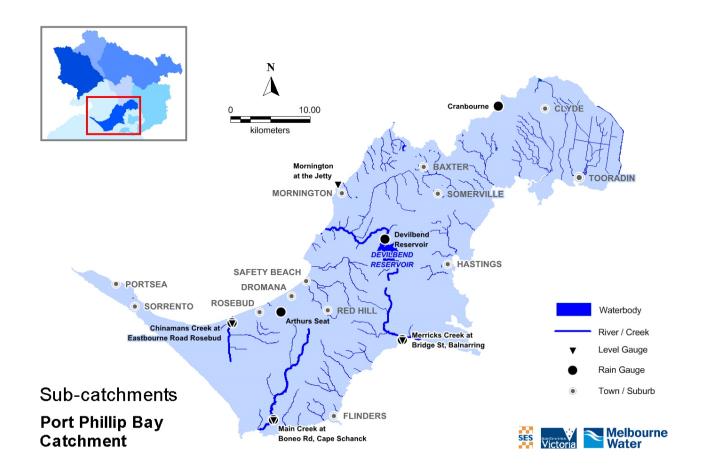
Mordiallic Creek Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Mordialloc Creek	N/A	Glen Eira	Glen Eira
Dandenong Creek		Monash	Monash
Elster Creek		Bayside / Glen Eira	Moorabbin / Glen Eira
Elwood Canal		Port Phillip	Port Phillip
Eumemmerring		Bayside	Moorabbin
Kananook Creek		Kingston	Chelsea
Mile Creek		Greater Dandenong	Greater Dandenong
Patterson River		Frankston	Frankston



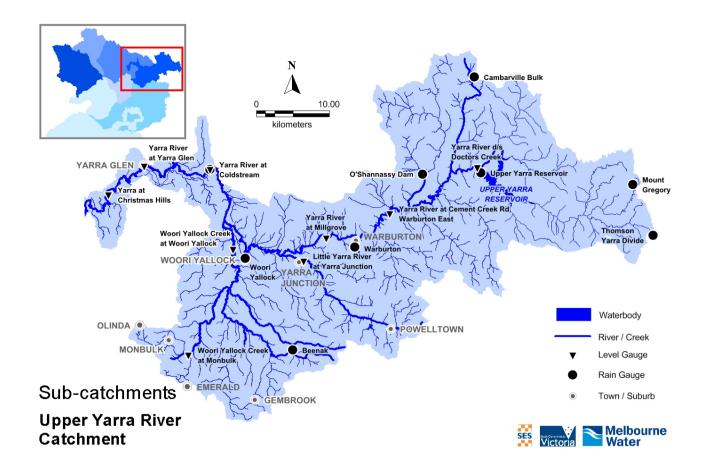
Port Phillip Bay Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Kananook Creek	Devils Bend	Frankston	Frankston
		Mornington Peninsula	Sorrento
			Hastings



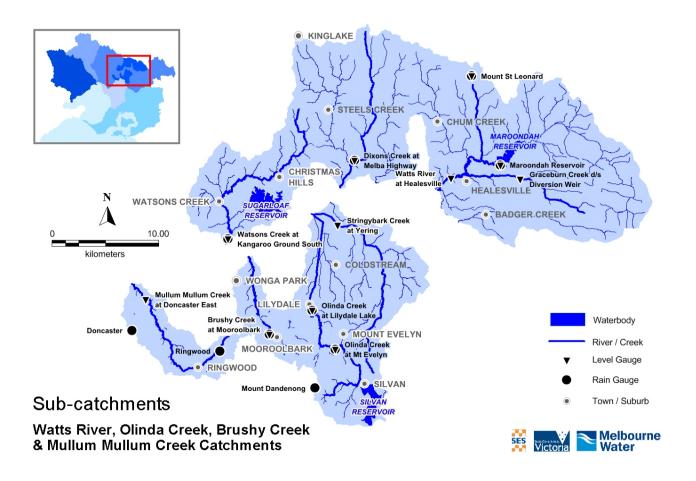
Upper Yarra Sub-catchments



Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Anderson Creek	O'Shannassy Reservoir	Yarra Ranges	Upper Yarra
Woori Yallock Creek	Upper Yarra Dam		Emerald
Yarra River			Healesville
Olinda Creek	Lilydale Lake		Lilydale



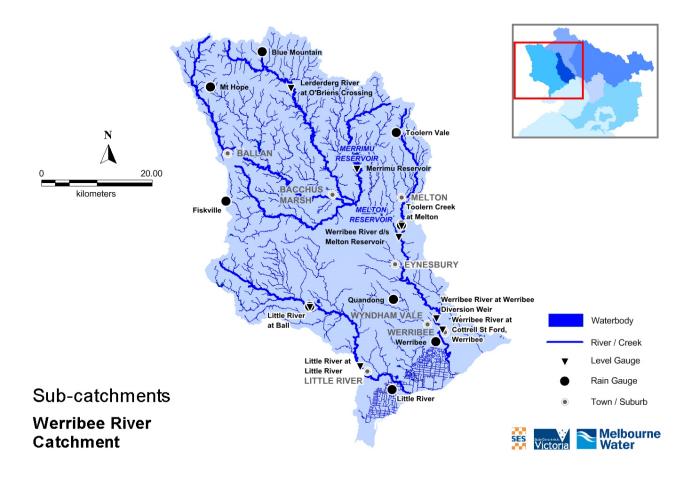
Watts River, Olinda Creek, Brushy Creek and Mullum Mullum Creek Sub-catchments



Key waterways	Reservoir / Storage	Municipalities	Central Region Units
	Area	affected	impacted
	(where applicable)		
Watts River	Maroondah	Yarra Ranges	Healesville
Yarra River	Maroondah	Yarra Ranges	Healesville
			Lilydale
			Manningham
Mullum Mullum		Manningham	Manningham
Creek			
Brushy Creek		Maroondah / Yarra	Maroondah /Lilydale
		Ranges	



Werribee Sub-catchments

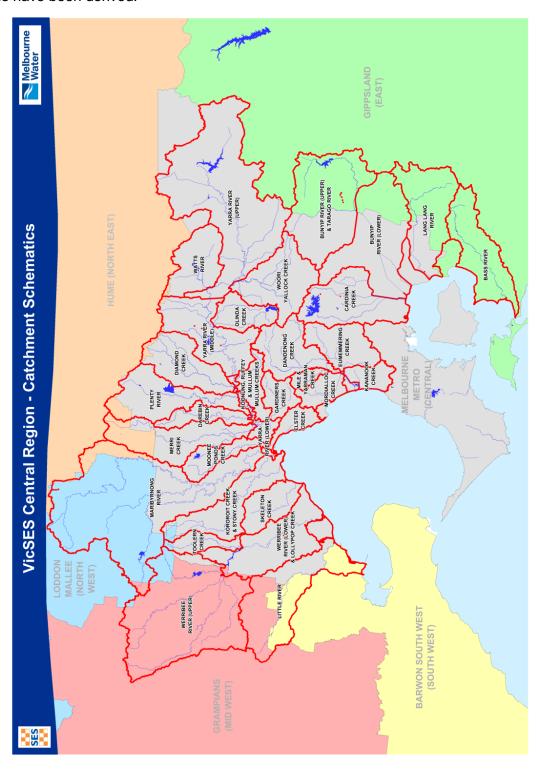


Key waterways	Reservoir / Storage Area (where applicable)	Municipalities affected	Central Region Units impacted
Werribee River	Melton Reservoir	Wyndham	Wyndham
			Wyndham West
Skeleton Creek		Wyndham	Wyndham
Kororoit Creek		Melton	Melton



Attachment 4 – Catchment Schematics

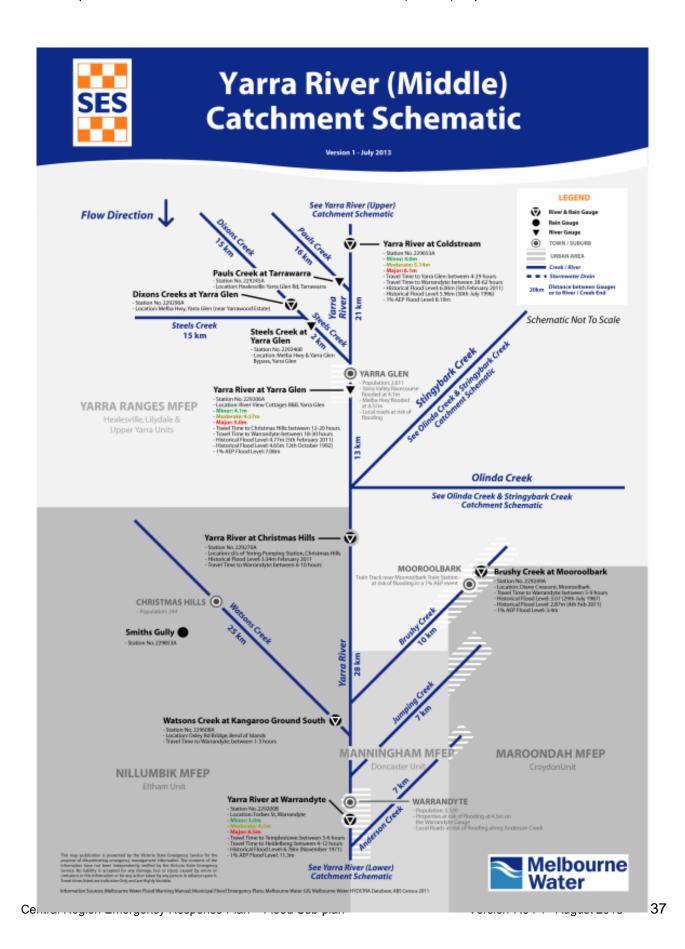
A complete set of Catchment Schematics have been developed for Central Region. The map below depicts the Central Region response area and associated geographical location from which Catchment Schematics have been derived.



Catchment Schematics can be accessed via FloodZoom (for registered users), and have been provided to Units. Catchment Schematics are also located in the appendices of updated MFEP's.



An example of a Catchment Schematic for the Yarra River (Middle) is provided below.





Attachment 5 – Levee Locations

The table below provides a list of all levee locations within the Central Region response area and identifies that relevant municipality that the levee is located.

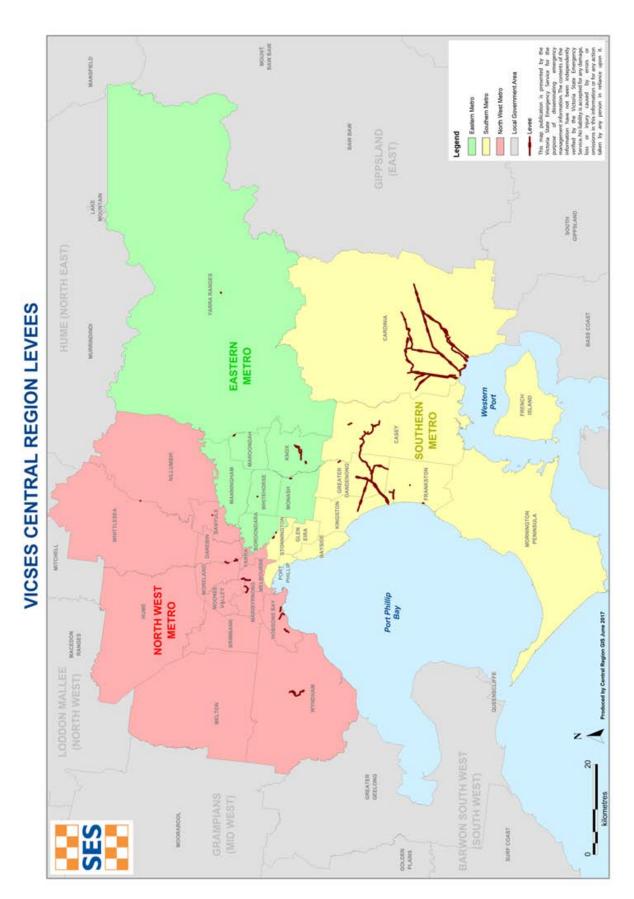
		Municipality		
1 1	Levee name APPLETREE DR LEVEE	MONASH		
	BLACKBURN NORTH DRAIN FLOODWALL (EAST)	WHITEHORSE		
	BRUSHY CREEK (EAST)	YARRA RANGES		
	BRUSHY CREEK (WEST)	MAROONDAH		
	BUNYIP MAIN DRAIN (NORTH)	CARDINIA		
	BUNYIP MAIN DRAIN (SOUTH)	CARDINIA		
	CARDINIA CREEK (EAST)	CARDINIA		
	CARDINIA CREEK (WEST)	CARDINIA		
	CARDINIA/GUM SCRUB CREEK OUTFALL (WEST)	CARDINIA		
	CARRUM OUTFALL (EAST)	GREATER		
	CHICKOW COTT MEE (EMOT)	DANDENONG		
11	CARRUM OUTFALL (WEST)	GREATER		
''	CARROW COTTALE (WEST)	DANDENONG		
12	CORHANWARRABUL CREEK (NORTH)	KNOX		
	DANDENONG CK (EAST)	GREATER		
	Britishe die (Eriet)	DANDENONG		
14	DANDENONG CK (WEST)	GREATER		
'-	Britished Git (WEST)	DANDENONG		
15	DEEP CK (EAST)	CARDINIA		
	DWARF GALAXIAS W/LAND LEVEE (SOUTH)	CASEY		
	EASTERN CONTOUR DRAIN (NORTH)	GREATER		
''	EASTERN SONTOOK BRAIN (NORTH)	DANDENONG		
18	EASTERN CONTOUR DRAIN (SOUTH)	GREATER		
	ENGLERRY GOLVIOGREDITATIVE (GOOTTI)	DANDENONG		
19	EASTERN CONTOUR DRAIN (WEST)	GREATER		
	ENGLERRY GOLD BLANK (WEST)	DANDENONG		
20	EEL RACE CREEK (NORTH) - BOGGY CK TO WADSLEY DRAIN			
	EEL RACE CREEK (NORTH) - MORNINGTON PENINSULA FWY	KINGSTON		
	TO FOOTBRIDGE			
	EEL RACE CREEK (SOUTH)	FRANKSTON		
	EUMEMMERRING CREEK (NORTH)	GREATER		
		DANDENONG		
23	EUMEMMERRING CREEK (SOUTH)	GREATER		
	,	DANDENONG		
24	FERNY CREEK (NORTH)	KNOX		
	GARDINERS CREEK (NORTH)	BOROONDARA		
	GUM SCRUB CK LWR (WEST)	CARDINIA		
	HALLAM CONTOUR DRAIN (NORTH)	CASEY		
	HALLAM CONTOUR DRAIN (NORTH)	GREATER		
	,	DANDENONG		
28	KANANOOK CREEK (EAST) RETAINING WALL	FRANKSTON		
	KELLETTS RD WETLAND LEVEE	KNOX		
30	KOROROIT CK (EAST) HOBSONS BA			
	KOROROIT CK (NORTH)	HOBSONS BAY		
	KOROROIT CK (WEST)	HOBSONS BAY		
	KOROROIT CREEK FLOODWALL	HOBSONS BAY		
	LARNE AVE DRAIN RETAINING WALL (WEST) MANNINGHAM			
	LAURIMAR PARK ESTATE LEVEE (NORTH) WHITTLE:			



36	MCDONALDS DRAIN (EAST)	CARDINIA	
37	MCDONALDS DRAIN (WEST)	CARDINIA	
38	MERRI CREEK (EAST)	DAREBIN	
39	MERRI CREEK (WEST)	MORELAND	
40	MONBULK CREEK (SOUTH)	KNOX	
41	MOONEE PONDS CREEK (EAST) - ARDEN ST TO MACAULAY RD	MELBOURNE	
41	MOONEE PONDS CREEK (EAST) - MACAULAY RD TO MT ALEXANDER RD	MOONEE VALLEY	
42	MOONEE PONDS CREEK (WEST) - ARDEN ST TO MACAULAY RD	MELBOURNE	
42	MOONEE PONDS CREEK (WEST) - MACAULAY RD TO MT ALEXANDER RD	MOONEE VALLEY	
43	MORDIALLOC CK (SOUTH)	GREATER DANDENONG	
44	MORDIALLOC CK (SOUTH)	KINGSTON	
45	NARRE WARREN DRAIN (EAST)	CASEY	
46	NARRE WARREN DRAIN (WEST)	CASEY	
47	NORTHERN BOUNDARY DRAIN (SOUTH)	CARDINIA	
48	NOT MW - FLEMINGTON FLOOD WALL	MELBOURNE	
49	OLD DEEP CK LEVEE (WEST)	CARDINIA	
50	PATTERSON RIVER (NORTH)	KINGSTON	
51	PATTERSON RIVER (SOUTH)	KINGSTON	
52	PENINSULA LINK BUND WALL	FRANKSTON	
53	STEELE CK - ROSE AVE LEVEE	MOONEE VALLEY	
54	TOOMUC CREEK LWR (WEST)	CARDINIA	
55	TROUPS CK EAST BRANCH (WEST)	CASEY	
56	TROUPS CK WEST (EAST)	CASEY	
57	TROUPS CK WEST (WEST)	CASEY	
58	TRUGANINA SWAMP (SOUTH)	HOBSONS BAY	
59	WADSLEY DRAIN (EAST)	FRANKSTON	
60	WADSLEY DRAIN (WEST)	FRANKSTON	
61	WATSONIA DRAIN (NORTH)	BANYULE	
62	WERRIBEE RIVER LWR (EAST)	WYNDHAM	
63	WERRIBEE RIVER LWR (WEST)	WYNDHAM	
64	YALLOCK OUTFALL (EAST)	CARDINIA	
65	YALLOCK OUTFALL (WEST)	CARDINIA	
66	YARRA RIVER (NORTH)	YARRA RANGES	



A map of levee locations within the Central Region response area is provided below.





Attachment 6 – Regional Resources

The Victoria State Emergency Service regional resources available within the Central Region response area are listed below.

Boats by resource number	Unit
Rigid (RB 523) Region Spare	Chelsea
IRB (RB579)	Chelsea
IRB (RB569)	Chelsea
IRB (RB577)	Essendon
IRB (RB555)	Footscray
IRB (RB547)	Footscray
IRB (RB598)	Footscray
Rigid (RB524)	Frankston
IRB (RB554)	Hobsons Bay
Rigid – V hull (RB506)	Hobsons Bay
IRB (RB592)	Hobsons Bay
IRB (RB543)	Manningham
IRB (RB544)	Manningham
IRB (RB545) Details TBC	Manningham
IRB (RB584)	Maroondah
IRB (RB535)	Melton
IRB (RB518)	Narre Warren
Rigid Punt (RB537)	Pakenham
Semi Rigid (RB540)	Port Phillip
IRB (RB576)	Port Phillip
Rigid (RB573)	Whitehorse
IRB (RB566)	Whittlesea
Semi Rigid (RB596)	Wyndham
IRB (RB515)	Wyndham West

Lighting Plants by resource number	Unit
Lighting Plant (Ops Support 2-05)	Brimbank
Lighting Plant (Ops Support 2-01)	Broadmeadows
Lighting Plant (Ops Support 2 – 30)	Frankston
Lighting Plant (Ops Support 2 – 07)	Glen Eira
Lighting Plant (Ops Support 2 –06)	Hastings
Lighting Plant (Ops Support 2 – 03)	Knox
Lighting Plant (Ops Support 2 – 02)	Lilydale
Lighting Plant (Ops Support 2 – 04)	Wyndham

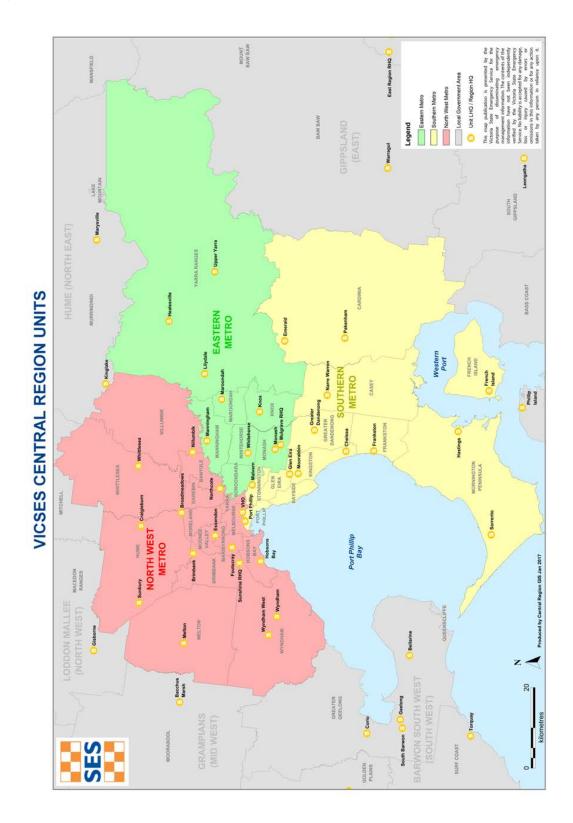
Other	Unit
Sandbag filling machine	Pakenham
Logistics Truck	Mulgrave
Mobile Command Vehicle	Knox
Forward Operations Vehicle	Knox
Sandbag Stores	Mulgrave, Knox, Chelsea, Pakenham,
	Footscray, Broadmeadows

41



Attachment 7 – Unit Location Map

A map of the Victoria State Emergency Service Unit locations within the Central Region response area is provided below.





Attachment 8 – Unit - Key Waterways

The below table provides a list of key waterways within Central Region and corresponding VICSES Units and municipalities impacted during flood events.

Key Waterways	Reservoir/ Storage Area (where applicable)	Municipalities Affected (including risk assessment)	Fairer Vic Boundaries to notify.	VICSES Units Impacted (Central Region)	
Bunyip River	N/A	Cardinia	Southern	Pakenham	
Cardinia Creek	Cardinia	a Casey Metro	Narre Warren		
Dandenong Creek	N/A	Greater Dandenong Casey Knox Cardinia Frankston Yarra Ranges	Southern Metro and East Metro	Greater Dandenong Narre Warren Knox Pakenham Frankston Lilydale	
Diamond Creek Plenty River Wallaby Creek	Torourrong	Nillumbik Hume Darebin Moreland	North West Metro	Nillumbik Craigieburn/Broadmeadows Northcote Broadmeadows	
Gardiners Creek	N/A	Whitehorse Monash Stonnington Boroondara	East Metro	Whitehorse Monash Malvern Malvern, Whitehorse	
Koroit Creek Skeleton Creek	N/A	Hobsons Bay Melton Brimbank Moreland	North West Metro	Hobsons Bay Melton Brimbank Broadmeadows	
Maribyrnong River	N/A	Brimbank Hume Maribyrnong	North West Metro	Brimbank Sunbury Footscray	
Merri Creek	Greenvale	Hume Darebin Yarra Hume	North West Metro	Craigieburn Northcote Northcote/Footscray Broadmeadows	
Moonee Ponds		Moonee Ponds		Essendon	

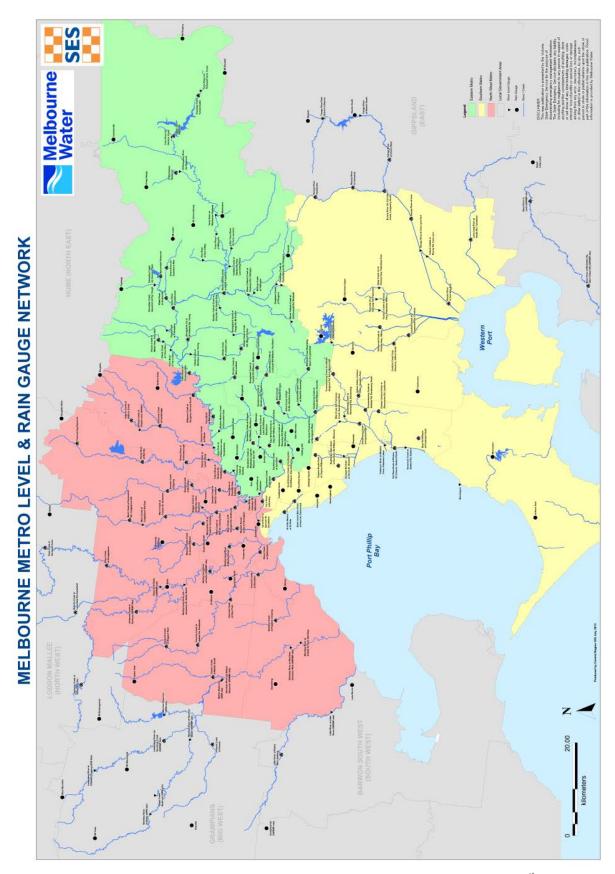


		Maribyrnong		Footscray	
Mordialloc Creek Dandenong Creek Elster Creek Elwood Canal Eumemmerring Kananook Creek Mile Creek Patterson River	N/A	Glen Eira Monash Bayside/Glen Eira Port Phillip Bayside Kingston Greater Dandenong Frankston	East and Southern Metro	Oakleigh Monash Moorabbin/Oakleigh Port Phillip Moorabbin Chelsea Greater Dandenong Frankston	
Kananook Creek	Devils Bend	Frankston Mornington Peninsula	Southern Metro	Frankston Sorrento Hastings	
Anderson Creek Woori Yallock Creek Yarra River Olinda Creek	O'Shannassy Reservoir Upper Yarra Dam	Yarra Ranges	East Metro	Upper Yarra Emerald Healesville Lilydale	
Watts River Yarra River Mullum Mullum Creek Brushy Creek	Maroondah	Yarra Ranges Yarra Ranges Manningham Maroondah/ Yarra Ranges	East Metro	Healesville Healesville/Lilydale/Manningham Manningham Croydon /Lilydale	
Werribee River Skeleton Creek Kororoit Creek	Melton reservoir	Wyndham Wyndham Melton	North West Metro	Wyndham, Wyndham West Wyndham Melton	



Attachment 9 – Regional Flood Gauge Map

A map of the Victoria State Emergency Service Unit locations within the Central Region response area is provided below.





Attachment 10 - IMT Readiness Levels - Flood

JSOP 2.03 - Incident Management Team (IMT) Readiness Arrangements

Schedule 6

IMT Readiness Levels - Flood

To determine the readiness level required, all three riverine flood conditions (FCL) described in the table below are needed to be predicted for 50% or more of an ICC footprint. Each river catchment, the upper and lower reaches of a river system have been allocated to an ICC footprint.

The RC may vary the actual number, distribution and level of an IMT from this schedule in order to manage local risks, as per section 15 of this JSOP.

IMTs should be in place as advised by the Regional Controller (RC) based on the risk, indicatively 2 hours before the community impact is expected to occur in the ICC footprint.

Where an IMT manages more than one ICC footprint, the RC in consultation with the SRC will determine the location of the IMT based on risk and consistent with the Regional Flood Response Plan and the SES Readiness and Activation considerations. Operational IMTs can be used for readiness, if they have the capacity to manage new emergencies in the initial stages

In addition to this schedule, the SRC may request a RC to form a Reserve IMT for deployment within a region or to support another region

In consultation with the SRC, a RC will advise when an IMT can deactivate or stand down the preparedness level.

			Flood Class Level (FCL) 4			L) ⁴
			Minor	Multiple	Multiple	Multiple
			Mod	> 2	>2	Multiple
			Major	0	≥1	≥2
Region	Primary ICC	ICC Cluster		Very High (high end)	Severe	Extreme
	Bendigo	Bendigo		Base (I)	Base (I)	Full (I)
Loddon Mallee	Mildura	Mildura		Base (C)	Base (I)	Core (I) Full (C)
		Swan Hill		base (C)	Base (I)	Core (I) Full (C)
Grampians	Ballarat	Ballarat		Base (C)	Base (I)	Core (I) Full (C)
Grampians	Horsham	Horsham		Base (I)	Base (I)	Core (I) Full (C)
Barwon South West	Geelong	Geelong		Base (I)	Base (I) Core (C)	Core (I) Full (C)
Barwon South West	Warrnambool	Warrnambool		Base (C)	Base (I) Core (C)	Core (I) Full (C)
North West Metro	Sunshine	Sunshine		Base (I)	Core (I)	Core (I) Full (C)
		Burnley			.,,	Full (I)
Eastern Metro	Dandenong	Ferntree Gully		Base (I)	Core (I)	Core (I) Full (C)
Southern Metro		Dandenong				Full (I)
	Benalla (NE CMA area)	Benalla		Base (I)	Base (I) Core (C)	Full (I)
		Wodonga			Base (I) Core (C)	Base (I) Full (C)
Hume		Wangaratta			Base (I) Core (C)	Base (I) Full (C)
	Seymour (Goulburn Broken - CMA area)	Seymour		Base (C)	Base (I) Core (C)	Core (I) Full (C)
		Shepparton		base (C)	Base (I) Core (C)	Full (C)
O'II	Traralgon	Traralgon		D (O)	Base (I) Core (C)	Full (I)
Gippsland	Bairnsdale	Bairnsdale		Base (C)	Base (I) Core (C)	Full (I)

⁴ Where no FCL provided for a river system, The RC is to consult the SES Agency Commander for the alignment of the warning issued to a FCL.

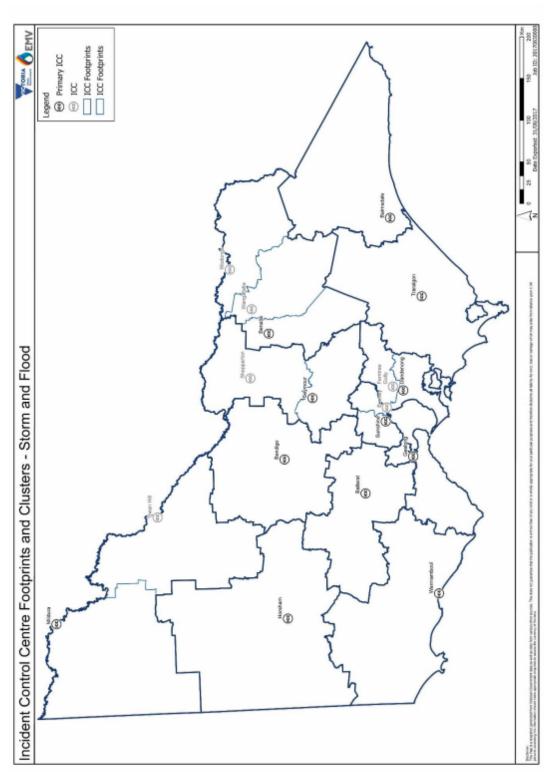
IMT Readiness Arrangements SOP J02.03 – version - 11.0 Page 13 of 14 4 September 2017 S

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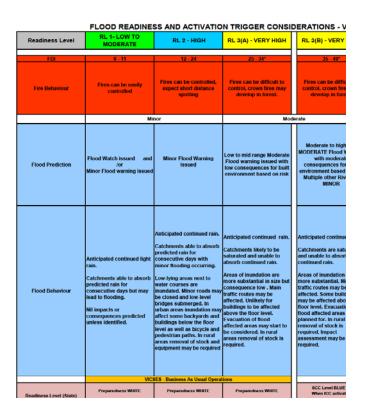
Schedule 4
ICC Footprint and Clusters – Flood and Storm







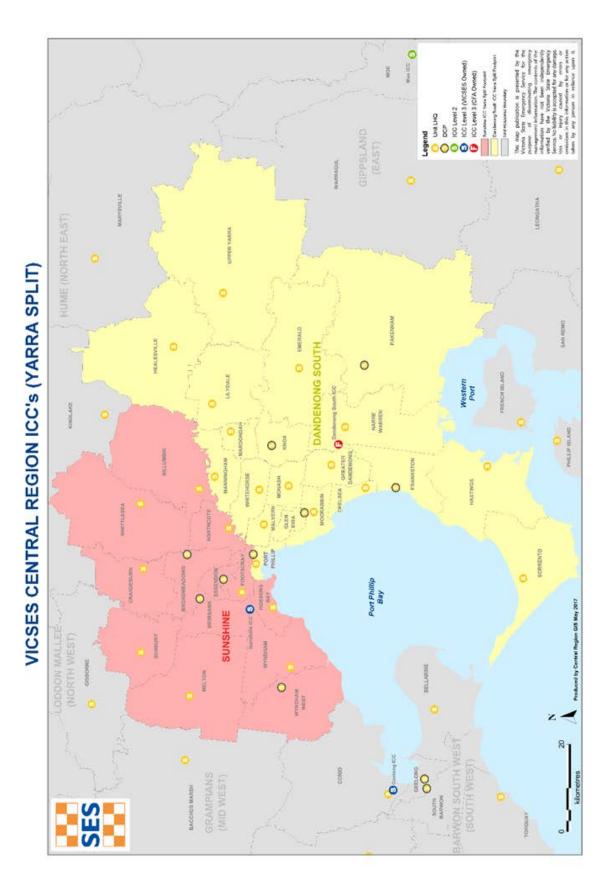
VICSES Flood Readiness and Activation Trigger Considerations (v3.0 – September 2017)





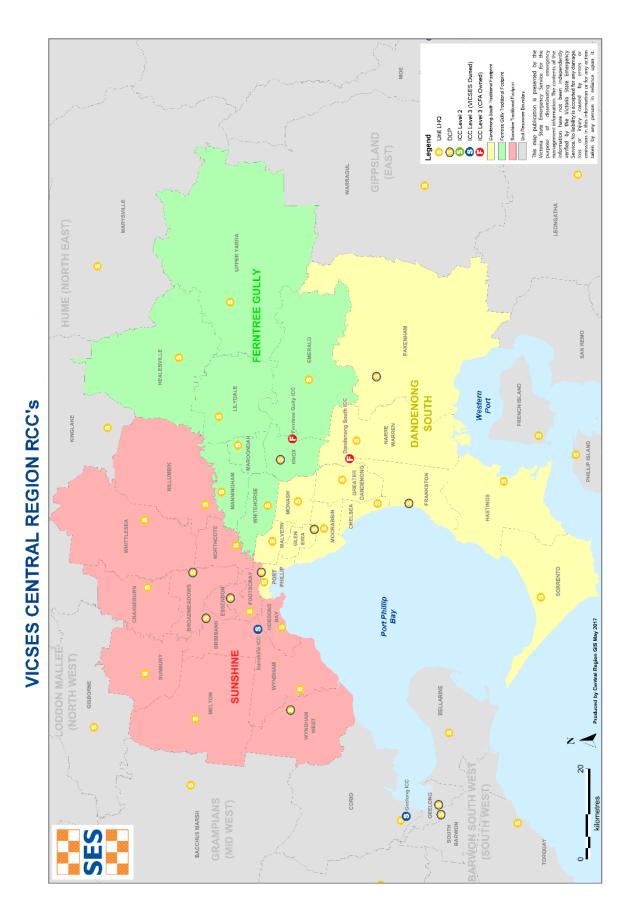
Attachment 11 – Control Centre Footprint Maps

A map Incident Control Centres (ICCs) located within Central Region response area is provided below.





A map of Regional Control Centres (RCCs) located within Central Region response area is provided below.





A map of Divisional Command Points (DCPs) located within Central Region response area is provided below.

