Yarra Ranges Shire

Storm and Flood Emergency Plan

A Sub-Plan of the Municipal Emergency Management Plan

For Yarra Ranges Council
And
VICSES Units Lilydale, Healesville,
Upper Yarra and Emerald

Version 4.1
Reviewed October 2020

Yarra Ranges Council

VICTORIA State Government

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Distribution List

Copy No.	Issue To: Position	Organisation	Date
Original	MEMP Committee Executive Officer	Yarra Ranges Council	
1	YRC Emergency Management	Yarra Ranges Council Office Copy	
2	MEMP Committee Chairperson	Yarra Ranges Council	
3	MERO	Yarra Ranges Council	
4	Deputy MERO	Yarra Ranges Council	
5	MRM	Yarra Ranges Council	
6	MERC	Lilydale Police Station	
7	RERC	Vic Police	
8	Station Commander	Yarra Glen Police Station	
9	Station Commander	Healesville Police Station	
10	Station Commander	Yarra Junction Police Station	
11	Station Commander	Warburton Police Station	
12	Regional Officer Emergency Management	VICSES Central Region	
13	Controller	VICSES Upper Yarra unit	
14	Controller	VICSES Healesville unit	
15	Controller	VICSES Lilydale unit	
16	Controller	VICSES Emerald unit	
17	Team Leader Hydrology and Flood Warden	Melbourne Water	
18	Flood Warning Manager	Bureau of Meteorology	
19	District Manager	DELWP	
20	Ranger In Charge	Parks Victoria Woori Yallock district office	
21	Group Manager 3	Ambulance Victoria Lilydale	
22	Operations Officer	CFA	
24	Regional Emergency Management Officer	VicRoads Burwood office	
25	Emergency Management Coordinator	Department of Human Services Box Hill	
26	Emergency Management Coordinator	Department of Health Eastern Metropolitan Region	
27	Team Leader	Power supplier SP Ausnet	
28	Team Leader	Yarra Valley Water	
29	Team Leader	South East Water	
30	Commander	MFESB	
31	ICC's - Woori Yallock, Ferntree Gully, Mulgrave, Dandenong, , Sunshine	CFA & SES	

The master copy of the plan will be on the Emergency Management portal of the Yarra Ranges Council website www.yarraranges.vic.gov.au/emergencymanagement

Document Transmittal Form / Amendment Certificate

This Municipal Flood Emergency Plan (MFEP) will be amended, maintained and distributed as required by VICSES in consultation with the Yarra Ranges Council.

Suggestions for amendments to this Plan should be forwarded to VICSES Central Region Office Unit 6, 3-5 Gilda Court, Mulgrave VIC 3170

Amendments listed below have been included in this Plan and promulgated to all registered copyholders.

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
1.1	11 Oct 2011	Kevin Johnson	Populate SES template with generic information.
1.2		Kevin Johnson	Changes from subcommittee meeting 3 Nov 2011.
1.3	13 Feb 2012	Diana Ferguson	Add changes as discussed with Council
1.4	April 2012	Kevin Johnson	Update the plan and commence populating the appendices
1.5	July 2012	Diana Ferguson	Update the plan with VICSES and Council comments
1.6	August 2012	Diana Ferguson	Updated the plan with Council Comments
2.0	May 2014	Ross Butler	Appendix A, B, C, F & G Updated
2.0	October 2014	Diana Ferguson and sub committee	Review and update of template
3.0	September 2017	Diana Ferguson	Update legislative references, acronyms, inclusion of operational information & addition of Appendix H
3.0	September 2017	Ross Butler	Update of Appendix A, B, C, F & G
4.0	September 2020	Ross Butler	New template applied. Appendix A, B, C, F & G Updated
4.1	October 2020	Diana Batley, Ross Butler and sub committee	Review and update of template. Staff Gauge tables added and hyperlinks amended.

This Plan will be maintained on SES website and linked to the Yarra Ranges www.yarraranges.vic.gov.au and

https://www.ses.vic.gov.au/get-ready/your-local-flood-information/yarra-ranges-shire-council

List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan:

The following abbreviations and acronyms are used in the Plan			
AAR	After Action Review	FZ	Floodway Zone
AEP	Annual Exceedance Probability	IC	Incident Controller
AHD	Australian Height Datum (the height of a location above mean sea level in metres)	ICC	Incident Control Centre
AIDR	Australian Institute of Disaster Resilience	IMT	Incident Management Team
AIIMS	Australasian Inter-service Incident Management System	IMS	Incident Management System
AoCC	Area of Operations Control Centre / Command Centre	EMLO	Emergency Management Liaison Officer
ARI	Average Recurrence Interval	LSIO	Land Subject to Inundation Overlay
AV	Ambulance Victoria	MECC	Municipal Emergency Coordination Centre
BoM	Bureau of Meteorology	MEMP	Municipal Emergency Management Plan
CEO	Chief Executive Officer	MEMPC	Municipal Emergency Management Planning Committee
CERA	Community Emergency Risk Assessment	MERC	Municipal Emergency Response Coordinator
CFA	Country Fire Authority	MERO	Municipal Emergency Resource Officer
CMA	Catchment Management Authority	MFB	Metropolitan Fire and Emergency Services Board
RERC	Regional Emergency Response Coordinator	MRM	Municipal Recovery Manager
RERCC	Regional Emergency Response Coordination Centre	PMF	Probable Maximum Flood
DHHS	Department of Health and Human Services	RAC	Regional Agency Commander
DoI	Department of Infrastructure	RCC	Regional Control Centre
DELWP	Department of Environment, Land, Water and Planning	RDO	Regional Duty Officer
DJPR	Department of Jobs, Precincts and Regions	SBO	Special Building Overlay
DOT	Department of Transport	SCC	State Control Centre
SEMP	Emergency Management Manual Victoria	SEMP	State Emergency Management Plan
EMT	Emergency Management Team	SEWS	Standard Emergency Warning Signal
EMV	Emergency Management Victoria	SHERP	State Health Emergency Response Plan
EO	Executive Officer	SOP	Standard Operating Procedure
FO	Floodway Overlay	VicPol	Victoria Police
FRV	Fire Rescue Victoria	VICSES	Victoria State Emergency Service
FWS	Flood Warning System		

Glossary

Below are terms defined for the purpose of this plan:

Term	Definition
Annual Recurrence Interval (ARI)	The average, or expected, value of the period between exceedances of a given rainfall or flow total accumulated over a given duration
Annual Exceedance Probability (AEP)	The probability that a given total rainfall or flow is accumulated over a given duration will be exceeded in any one year
Drainage system	A series of drains and waterways into which surface and storm water flows. Features of a drainage system can include underground pipe drains, open channels, retarding basins, floodways, waterway improvements, water quality works and environment protection measures. All drainage under 60 ha is maintained and operated by Yarra Ranges Council
Flash flooding	Sudden unexpected flooding caused by local heavy rainfall or rainfall in another area. Often defined as flooding which occurs within six hours of the rain which causes flooding.
Flood mapping	The process where the extent of flooding is documented in mapping software based on flood studies and surface elevations
Floodplain	Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation.
Hot spot	A known flood problem area which has a history of repeat flooding of a road, crossing or property, often highlighted through anecdotal information and customer complaints. It is a localised issue which will vary from council to council.
Natural drainage system	Flow paths which are largely undeveloped by human sources, these include rivers, streams, natural depressions and wetlands. All-natural systems greater than 60 ha are managed by Melbourne Water.
Overland flooding	Inundation by local runoff caused by heavier than usual rainfall. Overland flooding can be caused by local runoff exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage system to overflow.
Retarding Basin	A Retarding Basin is a large, open, free draining basin that temporarily stores collected stormwater runoff. These basins are normally maintained in a dry condition between storm events.
Runoff	The amount of rainfall that enters the stormwater drainage system, (underground pipes, overland flow paths, floodway and waterways) after losses such as infiltration has been taken into account.
Stormwater drainage system	A series of drains and waterways into which surface and stormwater flows. Features of a stormwater drainage system can include underground pipe drains, open channels, retarding basins, floodways, waterway improvements, water sensitive urban design, integrated water management systems and environment protection measures. All drainage under 60 ha is maintained and operated by Yarra Ranges Council
Stormwater Runoff	The amount of rainfall that enters the stormwater drainage system, (via pits, pipes, retarding basins, water sensitive structures, harvesting tanks and overland flow paths) after water which is not absorbed into the ground has been taken into account.

Part 1. INTRODUCTION

1.1 Municipal Endorsement

This Municipal Storm and Flood Emergency Plan has been prepared by the Yarra Ranges Council and with the authority of the Yarra Ranges MEMPC pursuant to Section 20 of the Emergency Management Act 1986 (as amended).

This MSFEP is a sub plan to the Yarra Ranges Council MEMP. It is consistent with the SEMP and the Victoria Flood Management Strategy, and takes into account the outcomes of the CERA process undertaken by the MEMPC.

The MSFEP is consistent with the Regional Flood Emergency Plan, Regional Storm Emergency Plan and the State Flood Emergency Plan, and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC)

This MSFEP is a result of the cooperative efforts of the Yarra Ranges Council MFPC and its member agencies.

Minor and administrative amendments will be made to this MSFEP from time to time without representing the Plan to the MEMPC. Any major structural or policy changes will be considered before adoption.

This Plan is endorsed by the Yarra Ranges Council MEMPC as a sub plan of the MEMP.

Endorsement

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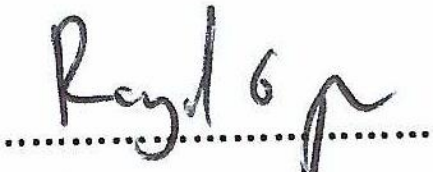
Chair MEMPC Date



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Ray Jasper

Regional Manager

Central Region VICSES Date

1.2 Purpose and Scope of this Storm and Flood Emergency Plan

The purpose of this MSFEP is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the Yarra Ranges Council.

As such, the scope of the Plan is to:

- Identify the Storm and Flood Risk to Yarra Ranges Municipality
- Support the implementation of measures to minimise the causes and impacts of storm and flood incidents within the Yarra Ranges Municipality
- Detail Response and Recovery arrangements including preparedness, incident management, command and control; and
- Identify linkages with Local, Regional and State emergency and wider planning arrangements with specific emphasis on those relevant to storm and flood.

1.3 Municipal Storm and Flood Planning Committee (MSFPC)

Membership of the Yarra Ranges MSFPC will comprise of the following representatives from the following agencies and organisations (refer to subcommittee terms of reference):

- VICSES (i.e. Unit Controller/s & Regional Officer – Emergency Management) **(Chair)**,
- Yarra Ranges Council,
- Victoria Police (i.e. Municipal Emergency Response Co-ordinator) (MERC),
- Melbourne Water,
- Department of Health and Human Services (DHHS) as required,
- Department of Human Services (DHS) as required,
- Department of Environment, Land, Water and Planning (DELWP) as required,
- Water Authorities as required,
- Bureau of Meteorology as required, and
- Other agencies as required

1.4 Responsibility for Planning, Review and Maintenance of this Plan

This MSFEP must be maintained in order to remain effective.

VICSES through the MSFEP has responsibility for preparing, reviewing, maintaining and distributing this Plan. The MSFPC will meet as required.

The Plan should be reviewed and where necessary, arrangements and information contained in it should be amended:

- Following any new flood or stormwater drainage studies;
- Following a change in non-structural and/or structural flood mitigation measures; or
- After the occurrence of a significant storm and/or flood event within the Municipality.

Part 2. BEFORE: PREVENTION / PREPAREDNESS ARRANGEMENTS

2.1 Community Awareness for all Types of Storm and Flooding

Details of this MSFEP will be released to the community through local media, VICSES engagement programs and websites (VICSES and the Municipality) upon formal adoption by Yarra Ranges MEMPC.

VICSES with the support of Yarra Ranges Council and Melbourne Water will coordinate community engagement programs for storm and flooding within the council area (i.e. Local Flood Guides and public events).

A Community Education Plan (CEP) to support this Plan will be developed in conjunction with the VICSES local unit. The VICSES local unit will lead the delivery of the CEP with support from the Yarra Ranges Council and VICSES Region.

2.2 Structural Flood Mitigation Measures

Refer to **Appendix A and C** for detailed information of structural flood mitigation measures.

2.3 Non-structural Flood Mitigation Measures

2.3.1 Exercising the Plan

Arrangements for exercising this Plan will be at the discretion of the MEMPC. This Plan should be regularly exercised (preferably on an annual basis) and/or reviewed after a significant event.

2.3.2 Storm and Flood Warning

Arrangements for storm and flood warning are contained within the State Flood Emergency Plan and State Storm Emergency Plan (see https://www.ses.vic.gov.au/em-sector/vicses-emergency-plans), the SEMP and on the BoM website (see http://www.bom.gov.au)

Specific details of local storm and flood warning system arrangements are provided in **Appendix E**.

2.3.3 Local Knowledge

Community Flood Observers provide local knowledge to VICSES and the Incident Control Centre regarding local insights and the potential impacts and consequences of an incident and may assist with the dissemination of information to community members.

There are no official community flood observers within the Yarra Ranges Shire however local knowledge is incorporated into this plan through consultation with local response agencies.

Previous event history and likely operational considerations are noted in the Flood Intelligence Cards in **Appendix C**. In line with the VICSES Local Knowledge Policy, reviews of this plan will be undertaken with input from multiple local sources to ensure appropriate local knowledge can be captured before, during and after incidents.

Part 3. DURING: RESPONSE ARRANGEMENTS

3.1 Introduction

3.1.1 Activation of Response

Storm and Flood response arrangements may be activated by the VICSES Regional Duty Officer (RDO) or Regional Agency Commander (RAC).

The VICSES RDO or RAC will activate agencies as required and documented in the VICSES Central Region Storm and Flood Emergency Plans, the State Storm Emergency Plan or the State Flood Emergency Plan (see https://www.ses.vic.gov.au/em-sector/vicses-emergency-plans)

3.1.2 Responsibilities

There are a number of agencies with specific roles that will act in support of VICSES and provide support to the community in the event of a serious storm and/or flood within the Yarra Ranges Municipality. These agencies will be engaged through the EMT.

The general roles and responsibilities of supporting agencies are as agreed within the Yarra Ranges Council MEMP, the SEMP, VICSES Central Region Flood Emergency Plan and State Flood and Storm Emergency Plans. (see http://www.ses.vic.gov.au/prepare/em-planning/state-plans).

3.1.3 Municipal Emergency Coordination Centre (MECC)

The function, location, establishment and operation of the MECC (or similar coordination centre) will be as detailed in the Yarra Ranges MEMP.

Liaison with the MECC (or similar coordination centre) will be through the VICSES RDO / IC or established ICC. In the event that a MECC is not operating, the Yarra Ranges Council MERO will be contacted.

3.1.4 Escalation

Most storm and/or flood incidents are of local concern and an appropriate response can usually be coordinated using local resources. However, when these resources are exhausted, the Regional arrangements provide for further resources to be made available, and then on a State-wide basis.

Resourcing and event escalation arrangements are described in the SEMP.

3.2 The Six C's

Arrangements in this MFEP must be consistent with the 6 C's detailed in State and Regional Flood Emergency Plans and the MEMP. For further information, refer to the SEMP.

- **Command:** Overall direction of response activity in an emergency.
- **Control:** Internal direction of personnel and resources within an agency.
- **Coordination:** Bringing together agencies and resources to ensure effective preparation for response and recovery.
- **Consequence:** Management of the effect of emergencies on individuals, communities, infrastructure and the environment.
- **Communication:** Engagement and provision of information across agencies and proactively with the community around preparation, response and recovery in emergencies.
- **Community Connection:** Understanding and connecting with trusted networks, leaders and communities around resilience and decision making.

Specific details of arrangements for this plan are to be provided in **Appendix C**.

3.2.1 Control

Functions 5(a), 5(b) and 5(c) of *the Victoria State Emergency Service Act 2005* detail the authority for VICSES to plan for and respond to flood.

Section 7.1 of the SEMP identifies VICSES as the Control Agency for storm and flood. It identifies DELWP as the Control Agency responsible dam safety as well as water and waste water service disruption related incidents and other emergencies.

All storm and flood response activities within the Yarra Ranges Municipality including those arising from a dam failure or retarding basin / levee bank failure incident will therefore be under the control of the appointed IC, or their delegated representative.

3.2.2 Incident Controller (IC)

As required, the IC will be appointed by the VICSES (as the Control Agency) to command and control available resources in response to a storm and/or flood event on the advice of the Bureau of Meteorology (or other reliable source) that a flood event will occur or is occurring. The IC responsibilities are as defined in the SEMP.

3.2.3 Incident Control Centre (ICC)

As required, the IC will establish an ICC from which to initiate incident response command and control functions. The decision as to if and when the ICC should be activated, rests with the Control Agency (i.e. VICSES).

Pre-determined Incident Control Centre locations are:

- Sunshine ICC
- Ferntree Gully ICC
- Burnley ICC

- Dandenong ICC
- Woori Yallock ICC

3.2.4 Divisions and Sectors

To ensure that effective Command and Control is in place, the IC may establish Divisions and Sectors depending upon the complexity of the event and resource capacities.

Divisions and Sectors may be established to assist with the management of storm and flooding within the Municipality.

3.2.5 Incident Management Team (IMT)

The IC will form an IMT in line with the AIIMs principles.

Refer to Section 3 of the SEMP for further guidance on IMTs.

3.2.6 Incident Emergency Management Team (IEMT)

The IC will establish a multi-agency IEMT to assist with the storm and/or flood response. The IEMT will consist of key personnel (with appropriate authority) from stakeholder agencies and relevant organisations who need to be informed of strategic issues related to incident control and who are able to provide high level strategic guidance and policy advice to the IC for consideration in developing incident management strategies.

Organisations, required within the IEMT (including Yarra Ranges Council) will provide an EMLO to the ICC if and as required as well as other staff and / or resources identified as being necessary, within the capacity of the organisation.

Refer to the SEMP for further guidance on EMTs.

3.2.7 On Receipt of a Flood Watch / Severe Weather Warning

The VICSES RDO/IC will undertake actions as defined within the flood intelligence cards (**Appendix C**) . General considerations by the IC/VICSES RDO will be as follows:

- Review storm and flood intelligence to assess likely storm and flood consequences
- Monitor weather and flood information (see www.bom.gov.au);
- Assess Command and Control requirements.
- Review local resources and consider needs for further resources regarding personnel, property protection, storm/flood rescue and air support
- Notify and brief appropriate officers. This includes RCC (if established), SCC (if established), Council (as outlined in the Yarra Ranges MEMP), other emergency services through the EMT;
- Assess ICC readiness (including staffing of IMT and EMT) and open if required;
- Ensure flood bulletins and community information are prepared and issued to the community;
- Monitor watercourses and undertake reconnaissance of low-lying areas;
- Develop media and community information management strategy;

- Ensure storm and flood mitigation works are being checked by owners;
- Develop and issue incident action plan, if required;
- Develop and issue situation report, if required.

3.2.8 On Receipt of the First and Subsequent Storm and/or Flood Warnings

VICSES Central Region RDO/IC will undertake actions as defined within the flood intelligence cards (**Appendix C**). General considerations by the VICSES Central Region RDO/IC will be as follows:

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters, rising, peaking or falling?
- Review flood intelligence to assess likely flood consequences. Consider:
    - What areas may be at risk of inundation;
    - What areas may be at risk of isolation;
    - What areas may be at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption;
    - The characteristics of the populations at risk; and
    - What areas may be at risk of building damage.
- Determine what the at-risk community need to know and do as the storm and/or flood develops.
- Warn the at-risk community by ensuring that an appropriate warning and community information strategy is implemented. This includes:
    - The current storm and/or flood situation;
    - Storm and/or Flood predictions;
    - What the consequences of predicted activity and or levels may be;
    - Public safety advice;
    - Who to contact for further information; and
    - Who to contact for emergency assistance.
- Liaise with relevant asset owners as appropriate (i.e. water and power utilities).
- Implement response strategies as required based upon storm and/or flood consequence assessment.
- Continue to monitor the storm/flood situation (see http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html and https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/).
- Continue to conduct reconnaissance of low-lying areas.

3.3 Community Information and Warnings

Guidelines for the distribution of community information and warnings are contained in the VICSES Central Region Storm and Flood Emergency Plans and State Flood Emergency Plan.

Community information and warnings communication methods available may include:

- EMCOP
- Emergency Alert;
- Phone messages (including SMS);
- Radio and Television;
- Two-way radio;
- Mobile and fixed public address systems;
- Sirens;
- Verbal Messages (i.e. Doorknocking);
- Agency Websites;
- VicEmergency Hotline;
- Variable Message Signs (i.e. road signs);
- Community meetings;
- Newspapers;
- Email;
- Telephone trees;
- Community Flood Wardens;
- Fax Stream;
- Newsletters;
- Letter drops; and
- Social media and/or social networking sites (i.e. Twitter and/or Facebook).

Refer to **Appendix E** for the specific details of how community information and warnings are to be provided.

The release of flood bulletins and information with regard to response activities at the time of a flood event is the responsibility of VICSES, as the Control Agency.

Responsibility for public information, including media briefings, rest with VICSES as the Control Agency. Council will assist VICSES to warn individuals within the community where practicable including activation of flood warning systems, where they exist.

Other agencies such as CFA, DELWP and VICPOL may also be requested to assist VICSES with the communication of community storm and/or flood warnings.

In cases where severe flash flooding is predicted, dam failure or landslip is likely or flooding necessitating evacuation of communities is predicted, the IC may consider the use of the Emergency Alert System and SEWS.

DHHS will coordinate information regarding public health and safety precautions.

3.4 Media Communication

The IC through the Public Information Unit established at the ICC will manage media communication (include MECC & State connection). If the ICC is not established the VICSES

Central RDO will manage all media communication. Yarra Ranges Council will work with the IC/RDO to ensure that consistent and timely messaging occurs.

3.5 Impact assessment (IA)

Impact Assessments (IA) can be conducted in accordance with the SEMP to assess and record the extent and nature of damage caused by storm and/or flooding. This information may then be used to provide the basis for Initial Impact Assessment (IIA) and recovery planning by Yarra Ranges Council, DHHS and recovery agencies.

The control agency is responsible for coordinating the collection, collations and dissemination of IA information on a whole-of government basis during the emergency response.

The purpose, function and conduct of IAs is outlined in the State Flood Emergency Plan and State Storm Emergency Plan. All Ias must be conducted in accordance with the SEMP.

3.6 Preliminary Deployments

When storm impacts and/or flooding is expected to be severe enough to cut access to towns, suburbs and/or communities the IC will consult with relevant agencies to ensure that resources are in place if required to provide emergency response. These resources might include emergency service personnel, food items and non-food items such as medical supplies, shelter, assembly areas, relief centres etc in line with the Yarra Ranges MEMP.

3.7 Response to Flash Flooding

Emergency management response to flash flooding should be consistent with the guideline for the emergency management of flash flooding contained within the VICSES Central Region Storm and Flood Emergency Plans and State Flood Emergency Plan.

When conducting pre-event planning for flash floods the following steps should be followed, and in the order as given:

1. Determine if there are barriers to evacuation by considering warning time, safe routes and, resources available;
2. If evacuation is possible, then evacuation should be the adopted strategy and it must be supported by a public information capability and a rescue contingency plan; Contact MERC who liaises with MERO and MRM about activating ERC (see MEMP);
3. Where its likely people will become trapped by floodwaters safety advice needs to be provided to people at risk advising them not to attempt to flee by entering floodwater if they become trapped, and that it may be safer to seek the highest point within the building and to telephone 000 if they require rescue; This advice needs to be provided even when evacuation may be possible, due the likelihood that not all community members will evacuate
4. For buildings known to be structurally unsuitable an earlier evacuation trigger will need to be established (return to step 1 of this cycle); and
5. If an earlier evacuation is not possible then specific preparations must be made to rescue occupants trapped in structurally unsuitable buildings either pre-emptively or as those people call for help.
6. Contact MERC and MERO at the earliest opportunity to allow relief preparation to commence.

7. Due to the rapid development of flash flooding it will often be difficult, to establish emergency relief centres ahead of triggering the evacuation. This is normal practice but this is insufficient justification for not adopting evacuation.

Response arrangements for flash flood events may be contained in **Appendix C**. Refer to the Vic Road Website for road closures (http://alerts.vicroads.vic.gov.au).

3.8 Evacuation

In Victoria, evacuation is largely voluntary, however in particular circumstances, legislation provides some emergency services with authority to remove people from areas or prohibit their entry.

The decision to recommend or warn people to prepare to evacuate or to evacuate immediately rests with the IC and where possible the IEMT.

It is the choice of individuals as to how they respond to this recommendation.

Once the decision is made, VicPol are responsible for the coordination of the evacuation process. VICSES and other agencies will assist where practical. VICSES is responsible for the development and communication of evacuation warnings.

VicPol (or delegate to Australian Red Cross) may take on the responsibility of registering people affected by the emergency (through the register find reunite program) including those who have been evacuated.

Refer to Evacuation Guidelines in Part 8 of the SEMP, of the SEMP and the Yarra Ranges Council Relief and Recovery section of the MEMP for guidance on evacuations for flood emergencies. If evacuation is determined as appropriate, Yarra Ranges Council should be notified.

There are currently no detailed evacuation arrangements for the Yarra Ranges Council. Detail will be populated into **Appendix D** of this plan if determined.

3.9 Flood Rescue

VicPol as the designated Control Agency for water rescue coordinates rescues undertaken during flood events.

In order to activate water rescue services, VICSES as a Control Agency for overall flood response, will identify areas at risk of requiring rescue and notify the Officer in Charge of the Water Police Search and Rescue Squad to request pre-deployment of rescue resources to those areas.

In conducting rescues VicPol may require the assistance of appropriately trained and equipped personnel. In these circumstances, appropriately trained and equipped VICSES units or other agencies may carry out rescues.

Rescue operations may be undertaken where voluntary evacuation is not possible, has failed or is considered too dangerous for an at-risk person or community. An assessment of available flood rescue resources (if not already done prior to the event) should be undertaken prior to the commencement of Rescue operations.

Rescue is considered a high-risk strategy to both rescuers and persons requiring rescue and should not be regarded as a preferred emergency management strategy. Rescuers should always undertake a dynamic risk assessment before attempting to undertake a flood rescue.

3.10 Aircraft Management

Aircraft can be used for a variety of purposes during storm and/or flood operations including evacuation, resupply, reconnaissance, intelligence gathering and emergency travel.

Air support operations will be conducted under the control of the IC in line with State Aircraft Unit Policy 01-Air Operations.

3.11 Resupply

Communities, neighbourhoods or households can become isolated during storms and/or floods as a consequence of road closures or damage to roads, bridges and causeways. Under such circumstances, the need may arise to resupply isolated communities/properties with essential items.

When predictions/intelligence indicates that communities, neighbourhoods and/or households may become isolated, and if time permits VICSES will advise businesses and/or households that they should stock up on essential items.

After the impact, agencies can assist with the transport of essential items to isolated communities and assisting with logistics functions.

Resupply operations are to be included as part of the emergency relief arrangements outlined in the Yarra Ranges MEMP.

3.12 Essential Infrastructure and Property Protection

Essential Infrastructure and Property (e.g., roads, utility, telecommunications etc.) may be affected in the event of a storm and/or flood.

The IC will ensure that owners of Essential Infrastructure are kept advised of the storm/flood situation. Essential Infrastructure providers must keep the IC informed of their status and ongoing ability to provide services.

The IC will determine the priorities related to the use of sandbags, which will be consistent with the strategic priorities.

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of Essential Infrastructure. If time permits, requests for supplementary supply should be carried out in line with the Yarra Ranges MEMP. The IC will determine the priorities related to the use of sandbags, which will be consistent with the State Emergency Management priorities and VICSES Sandbagging policy.

Property may be protected by:

- Sandbagging to minimise entry of water into buildings;
- Encouraging businesses and households to lift or move contents; and
- Construction of temporary levees in consultation with Melbourne Water, Yarra Ranges Council and VICPOL and within appropriate approval timeframes.

The IC will ensure that owners of Essential Infrastructure are advised and updated on the flood situation. Essential Infrastructure providers must keep the IC informed of their status and ongoing ability to provide services.

Refer to **Appendix C** for further specific details of essential infrastructure requiring protection.

3.13 Disruption to Services

Disruption to services other than essential infrastructure and property can occur in storm/flood events. Refer to **Appendix D** for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in Yarra Ranges Municipality.

3.14 Levees

Yarra Ranges does have identified levees.

Levee owners / operators are responsible for the maintenance, operation and monitoring of their levees. Levee owners / operators must keep the IC informed of levee status and be prepared to provide expert advice to the IC about the design and construction of their levees.
In accordance with the strategic emergency management priorities, the IC may assist levee owners to coordinate resources, both technical and physical, to provide advice and affect temporary repairs to or augmentation of levees.

3.15 Road Closures

Yarra Ranges Council, VicPol and VicRoads will carry out their formal functions of road closures. This includes the observation and placement of warning signs, and road blocks to its designated local and regional roads, bridges, walking and bike trails.

VicPol may liaise with and advise Yarra Ranges Council and VicRoads of the need to erect warning signs and / or closure of roads and bridges. VicRoads are responsible for designated main roads and highways and Councils are responsible for the designated local and regional road network.

VICROADS, VicPol and Yarra Ranges Council will communicate community information regarding road closures as outlined in the Yarra Ranges MEMP.

3.16 Dam Spilling / Failure and Landslide

3.16.1 Dam Spilling / Failure

DEWLP is the Control Agency for dam safety incidents (e.g. breach, failure or potential breach / failure of a dam), however VICSES is the Control Agency for any flooding that may result.

Major dams with potential to cause structural and community damage within the Municipality are contained in **Appendix A**. Refer to DELWP Dam Safety Plan within the Yarra Ranges MEMP. Melbourne Water also have Dam Safety Emergency Plans for their operated Dams.

3.16.2 Landslide

VICSES is the Control Agency for Landslide incidents; VICSES is also the Control Agency for any flooding that may result.

Major Landslide with potential to cause structural and community damage within the Municipality are contained in **Appendix A**.

3.17 Waste Water related Public Health Issues and Critical Sewerage Assets

Inundation of critical sewerage assets including septic tanks and sewerage pump stations may result in water quality problems within the Municipality. Where this is likely to occur or has occurred, South East Water and Yarra Valley Water are the agencies responsible for the critical sewerage assets. These agencies should undertake the following:

- Advise VICSES and the Yarra Ranges Council MERO of the security of critical sewerage assets to assist preparedness and response activities in the event of flood;
- Maintain or improve the security of critical sewerage assets;
- Check and correct where possible the operation of critical sewerage assets in times of flood; and
- Advise the ICC in the event of expected or actual inundation of critical sewerage assets.

It is the responsibility of the Yarra Ranges Council Environmental Health Team and/or EPA to inspect and report on any water quality issues relating to flooding on Council and/or privately owned land.

General Public Health information and messages are provided by Yarra Ranges Council,, EPA and DHHS and may contain information that is relevant prior to, during and following an incident. Information may also be provided in sub plans to the MEMP, specific health notifications and, after discussion within the IEMT may be included in Flood Bulletins.

3.18 Access to Technical Specialists

VICSES Manages contracts with private technical specialists who can provide technical assistance in the event of flood operations or geotechnical expertise. Refer to VICSES SOP061 for the procedure to engage these specialists.

3.19 After Action Review

As the lead agency VICSES will coordinate the after action review arrangements of storm/flood operations as soon as practical following an event.

All agencies involved in the storm/flood incident should be represented at the AAR.

Part 4. AFTER: EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS

4.1 General

Arrangements for emergency relief and recovery from any emergency, including storm/flood incident within the Yarra Ranges Municipality are detailed in the Yarra Ranges Council MEMP – Relief and Recovery Sub-plan.

4.2 Emergency Relief

The IC determines the need for emergency relief services with advice from the emergency management team (such as IEMT) including the MRM in accordance with Part 4 of the SEMP. IC's are responsible for ensuring that relief arrangements have been considered and implemented where required under the State Emergency Relief and Recovery Plan (Part 4 of the SEMP). These should be carried out in line with the Yarra Ranges MEMP (ERC Subplan)

The range and type of emergency relief services to be provided in response to a storm/flood event will be dependent upon the size, impact, and scale of the flood. Refer to Section 4 of the SEMP for further information.

Suitable relief facilities identified for use during floods are detailed in **Appendix D** and/or the MEMP.Details of the relief arrangements are available in the Yarra Ranges MEMPlan.

4.3 Animal Welfare

Matters relating to the welfare of livestock are to be referred to DJPR.

Matters relating to companion animals will be shared between Council and RSPCA. Council assists in the rehousing of displaced companion animals.

Requests for emergency supply and/or delivery of fodder to stranded livestock or for livestock rescue are passed to DJPR.

Matters relating to the welfare of wildlife are to be referred to DELWP and Yarra Ranges Council.

Refer to the State Emergency Animal Welfare Plan and Eastern Metro Councils Animal Welfare Plan for detailed arrangements.

4.4 Transition from Response to Recovery

VICSES as the Control Agency is responsible for ensuring effective transition from response to recovery. Transition should occur in consultation with emergency management teams (including IEMT and MRM). Further information about transition is provided in the SEMP Part 4 and the Yarra Ranges MEMP.

Where the Yarra Ranges MECC has been activated, council will lead municipal recovery activity as outlined in the MEMP.

APPENDIX A – FLOOD THREATS FOR YARRA RANGES

General

The Yarra Ranges Municipal area is located in the outer eastern and north-eastern suburbs of Melbourne. It extends into the Yarra Valley and Dandenong Ranges, covering a total area of 2,470 km^2. The Yarra Ranges Municipality is the largest in area of all the local government areas in Melbourne, with a diverse mix of urban and rural areas. The municipality is made up of nine wards and has a population of 158,173 people, as of June 2018[1].

European settlement first began in the Yarra Ranges region during the early 1830's. This land has in the past been occupied by the traditional Bunnurrong and Wawurrong people. The Yarra Ranges municipality was formed in 1994, combining the former Healesville, Lilydale, Sherbrooke and Upper Yarra municipalities[1].

Flood modelling undertaken by Melbourne Water to date has identified approximately 4,973 properties within the Yarra Ranges municipality that are affected (either in yard or over-floor) by 100-year ARI flooding from waterways and overland flows[2].

Riverine Flooding

Large severe floods generally occur as a result of a moist warm airflow from northern Australia bringing moderate to heavy rainfall over a period of 12 hours or more following a prolonged period of general rainfall. The period of general rainfall "wets up" the catchments and (partially) fills both the on-stream dams and the natural floodplain storage. These combine to increase the runoff generated during the subsequent period of heavy rainfall.

Large but less severe floods result from sequences of cold fronts during winter and spring that progressively wet up the catchments and fill the on-stream dams and the natural floodplain storage. Prolonged moderate to heavy rain leads to major flooding.

Water level rises through Yarra Ranges municipality may be delayed following a heavy rainfall event; with flooding upstream of Yarra River possibly lasting for several days and taking from 12-24 hours to reach the lower reaches of the municipality. Flooding along the Yarra River and its tributaries can vary from fairly quick rises and falls, especially around Warburton and Healesville to slow water movement with prolonged inundation around Yarra Junction or Yarra Glen.

Flash Flooding and Overland Flows

Short Duration, high intensity rainfall (usually associated with thunderstorms) can also cause localised flooding within the municipality along overland flow paths when the local urban drainage system surcharges. Such events, which are mainly confined to the summer months, do not generally create widespread flooding since they only last for a short time and affect limited areas. Flooding from these storms occurs with little warning and localised damage can be severe.

High intensity rainfall such as associated with thunderstorms giving average rainfall rates of more than 20mm/hour for an hour or more is likely to lead to flash flooding and / or overland flows, across the urbanised parts of the municipality.

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[1] Regional Population Growth, Australia 2017-18: Population Estimates by Local Government Area (ASGS 2018)

[2] Flood Management Plan for Yarra Ranges Council and Melbourne Water, June 2016

Blocked or capacity impaired stormwater drains can also lead to overland flows and associated flooding: the drain surcharges and excess water flows above ground.

Description of Major Waterways and Drains

The main waterway running through the Yarra Ranges municipality is the Yarra River. The upper reaches of the Yarra River run through the municipality and the river itself begins in the Yarra Ranges National Park. Catchment Schematics in **Appendix G** show sections of the Yarra River within the municipality, including the locations of major tributaries such as the Don River, Watts River, Woori Yallock Creek, Stringybark Creek, Steels Creek, Dixons Creek and the Little Yarra River. More detailed sections of the Yarra River can be viewed in **Appendix F**.

Descriptions of other major waterways can be seen in Table A1. To view these and other major waterway locations within the municipality, see Figure A1 or Map B in **Appendix F**.

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Aldermans Creek	Reefton & East Warburton	Little Stringybark Creek	Mount Evelyn & Wandin North
Andrew St Drain	Mooroolbark	Little Yankee Jim Creek	Reefton
Armstrong Creek	Reefton	Little Yarra River	Gilderoy, Gladysdale, Launching Place, Powelltown, Three Bridges & Yarra Junction
Armstrong Creek East Branch	Reefton	Log Creek	Gruyere
Back – Stairs Creek	Warburton	Lone Star Creek	Yellingbo
Baker Creek	Cambarville & East Warburton	Lowes Creek	Mcmahons Creek
Balcombe Ave Drain	Mooroolbark	Lyrebird Creek	Olinda
Batts Creek	Reefton	Lyrebird Creek	Big Pats Creek
Bears Creek	Cambarville	Lyrebird Gully Creek	Olinda
Beer Creek	Powelltown	Macclesfield Creek	Macclesfield
Bellell Creek	Cambarville	Mackley Creek	Powelltown
Big Bill Creek	Mcmahons Creek	Mann Creek	Warburton
Big Flume Creek	East Warburton	Marble Creek	East Warburton
Big Pats Creek	Big Pats Creek & Warburton	Martin Gully	Wesburn
Black Sand Creek	Three Bridges	Mast Gully Creek	Upwey
Blackwood Creek	Powelltown	Mathina Creek	Healesville
Blackwood Dr Drain	Wonga Park	McCrae Creek	Hoddles Creek & Yellingbo
Blake Creek	Powelltown	McDonald Creek	East Warburton
Blue Nose Creek	Wesburn	McKillop Creek	Mount Evelyn
Bluey Creek	Warburton	McMahons Creek	Mcmahons Creek
Bob Mann Creek	The Patch	Melba Ave Drain	Lilydale
Boggy Creek	Seville, Wandin East, Badger Creek & Mount Toolebewong	Menzies Creek	Menzies Creek
Boys Camp Creek	Powelltown	Mick Creek	Toolangi
Brahams Creek	East Warburton	Middle Creek	Silvan
Branch Creek	Cambarville	Mississippi Creek	Big Pats Creek & East Warburton
Bride Creek	Big Pats Creek & Warburton	Monbulk Creek	Belgrave, Belgrave Heights, Lysterfield & Tecoma
Brisbane Creek	Warburton	Moon Gully Creek	Powelltown
Britannia Creek	Wesburn & Yarra Junction	Mooroolbark Drain	Mooroolbark
Briton Creek	Cambarville	Mooroolbark North Drain	Chirnside Park

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Brushy Creek	Chirnside Park, Croydon, Kilsyth, Mooroolbark & Wonga Park	Morley Creek	Fernshaw
Brushy Park Rd Drain	Wonga Park	Morris Gully	Warburton
Bungalook Creek	Kilsyth & Montrose	Mortimere Creek	Warburton
Burn Creek	East Warburton	Mosquito Creek	Healesville
Calder Creek	Warburton	Muddy Creek	Belgrave South & Narre Warren East
Cambridge Rd Drain	Montrose	Muddy Creek	Mcmahons Creek & Warburton
Cardinia Creek (Upper)	Harkaway	Myers Creek	Healesville, Toolangi & Toolangi
Carronvale Rd Drain	Mooroolbark	Myrtle Creek	Don Valley, Fernshaw & Healesville
Casells Creek	Sassafras	Nathania Springs Creek	Monbulk
Cement Creek	East Warburton & Warburton	Nelson Rd Drain	Coldstream & Lilydale
Cement Creek East Branch	East Warburton	New Chum Creek	Chum Creek, Healesville & Toolangi
Cement Creek West Branch	East Warburton	Nine Mile Creek	Toorongo
Cherry Hill Drain	Chirnside Park & Coldstream	No. 3 Creek	Warburton
Chirnside Park Drain	Chirnside Park	O'Shannassy River	East Warburton & McMahons Creek
Clear Creek	Cambarville	O'Shannassy River West Branch	East Warburton
Club Creek	Macclesfield	Olinda Creek	Coldstream, Kalorama, Lilydale, Mount Dandenong, Mount Evelyn, Silvan & Yering
Cockatoo Creek	Cockatoo, Macclesfield & Yellingbo	Orange Creek	Mcmahons Creek
Coldstream Drain	Coldstream	Paul Creek	Dixons Creek, Tarrawarra & Toolangi
Collas Creek	Warburton	Paynes Rd Drain	Chirnside Park
Condon Creek	Gladysdale & Healesville	Pembroke Rd Drain	Mooroolbark
Contention Gully	Toorongo	Perrins Creek	Olinda
Contentment Creek	Fernshaw	Pheasant Creek	Warburton
Coranderrk Creek	Badger Creek, Healesville & Warburton	Picaninny Creek	Badger Creek & Healesville
Crock Creek	East Warburton	Platts Creek	Wesburn
Crooked Creek	East Warburton	Postman Creek	East Warburton
Cumberland Creek	Cambarville	Powles Creek	Wesburn
Damper Creek	Cambarville	Punchgully Creek	Badger Creek
Dandenong Creek (Upper)	Kilsyth, Montrose, Mount Dandenong & Olinda	Purches St Drain	Cambarville
Dedman Creek	East Warburton	Quarry Creek	Mcmahons Creek
Dee River	Millgrove & Warburton	Railway Parade M.D.	Healesville
Deep Creek	Mcmahons Creek	Red Creek	Mcmahons Creek
Desmond Creek	Monbulk	Rich Creek	Mount Dandenong
Devils Creek	Woori Yallock	Richards Creek	Mcmahons Creek
Dirt Gully Creek	Warburton	Rifle Range Gully	Olinda
Dixons Creek	Dixons Creek & Yarra Glen	Rocky Creek	Warburton
Dixons Creek East Branch	Dixons Creek	Rundells Creek	Olinda
Doctors Creek	Reefton	Sassafras Creek	Monbulk & Sherbrooke

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Don Creek	Launching Place	Sawpit Creek	Healesville
Don Rd Drain	Healesville	Saxton Creek	Gilderoy
Don River	Don Valley & Launching Place	Scotchmans Creek	Warburton
Donnellys Creek	Healesville	Sheep Station Creek	Hoddles Creek & Yellingbo
Donovan Creek	Cambarville	Shepherd Creek	Gembrook & Yellingbo
Dry Creek	Kinglake & Steels Creek	Sherbrooke Creek	Belgrave & Sherbrooke
Dwyer Gully	East Warburton	Silvan & Monbulk Saddle Dam	Monbulk & Silvan
Edwardstown Creek	Wesburn	Slaty Creek	Gladysdale & Three Bridges
Egg Rock Creek	Beenak	Smoko Creek	Mcmahons Creek
Eighteen Mile Creek	Toorongo	Smyth Creek	East Warburton
Ely Creek	Wesburn	Snobs Creek	Reefton
Emerald Creek	Monbulk	Starling Creek	East Warburton
Ettersglen Creek	Fernshaw	Starvation Creek	Mcmahons Creek
Eumemmerring Creek Upper	Narre Warren East	Steels Creek	Steels Creek & Yarra Glen
Falls Creek	Toorongo	Stockdales Creek	Millgrove
Federal Creek	Mcmahons Creek	Stoney Creek	Monbulk
Fehring Creek	Cambarville	Storm Creek	Warburton
Ferndale Creek	Silvan	Stringybark Creek	Coldstream, Gruyere, Mount Evelyn, Silvan, Wandin North & Yering
Ferntree Gully Creek	Tremont	Sunshine Creek	Yarra Glen
Ferny Creek (U/S R/B)	Ferny Creek, Tecoma, Upper Ferntree Gully & Upwey	Taylor Creek	Three Bridges
Fir Tree Creek	Gladysdale & Three Bridges	The Barrier Creek	Gladysdale & Yarra Junction
Fitzpatick Creek	Powelltown	Theodore Creek	Cambarville
Five Ways Drain	Kilsyth & Mooroolbark	Ti-Tree Creek	Monbulk
Flowerpot Creek	Mcmahons Creek	Tin Mile Creek	Powelltown
Forest Rd Drain	Tremont	Tomahawk Creek	Beenak & Gembrook
Four Mile Creek	Warburton	Tugwell Creek	Wesburn
Frenchmans Creek	Millgrove & Wesburn	Twin Creek	Warburton
Full and Plenty Creek	Steels Creek	Two Mile Creek	Mcmahons Creek
Fuller Rd Drain	Lilydale & Mount Evelyn	Upwey Creek	Upper Ferntree Gully
Fussel Rd Drain	Montrose	Ure Creek	Launching Place & Mount Toolebewong
Garden St D.S.	Kilsyth	Walkers Creek	Millgrove & Warburton
Geordie Creek	East Warburton	Wallaby Ck / Trib Of Olinda Ck	Mount Dandenong
Golding Creek	Three Bridges	Walsh Creek	Cambarville & Reefton
Grace Burn Creek	Healesville	Wandana Cres Drain	Mooroolbark
Hackett Creek	Three Bridges	Wandin Yallock Creek	Gruyere, Seville, Seville East, & Wandin East
Hansen Creek	Hoddles Creek	Wattle Creek (Lower)	Seville East
Hearse Creek	Wesburn	Wattle Valley Creek	Mount Evelyn
Heathfield Grove Drain	Lilydale, Montrose & Mount Evelyn	Watts River	Fernshaw, Healesville & Warburton
Hereford Rd Drain	Lilydale	Webers Creek	Gruyere & Woori Yallock
Hoddles Creek	Hoddles Creek	Webster Creek	East Warburton
Hoddles Creek	Launching Place	Wild Cattle Creek	Seville & Wandin North

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Hope Gully Creek	East Warburton	Wild Dog Creek	Wandin North
Hyde Creek	Warburton	Wishing Well Creek	Mount Evelyn
Ida Roy Creek	Olinda	Wombat Creek	Gladysdale & Reefton
Jehosaphat Creek	Kinglake & Steels Creek	Wood Creek	Toorongo
Johnson Creek	East Warburton	Woori Yallock Creek	Gruyere, Monbulk, Seville, Seville East & Yellingbo
Kiln Creek	Wesburn	Woori Yallock M.D. Diversion	Woori Yallock
Kilsyth M.D. D.S.	Kilsyth & Montrose	Yankee Jim Creek	Wesburn
King Creek	Warburton	Yarra Glen M.D.	Yarra Glen
Kobecke Creek	Three Bridges	Yarra Junction M.D.	Yarra Junction
Learmonth Creek	Powelltown	Yarra River	Reefton, Toorongo, Coldstream, Healesville, Yarra Glen, Yering, Gruyere, Healesville, Launching Place, Woori Yallock, East Warburton, McMahons Creek, Millgrove, Warburton & Wesburn
Lilydale Drain	Lilydale	Yellow Creek	Mcmahons Creek
Lilydale East Drain	Coldstream, Lilydale & Yering	York Rd Drain	Mount Evelyn
Lilyponds Creek	Coldstream & Yering	Ythan Creek	Warburton
Little Mick Creek	Big Pats Creek & Warburton		

Table A1 – Melbourne Water Drains and Waterways within or bordering the Shire of Yarra Ranges

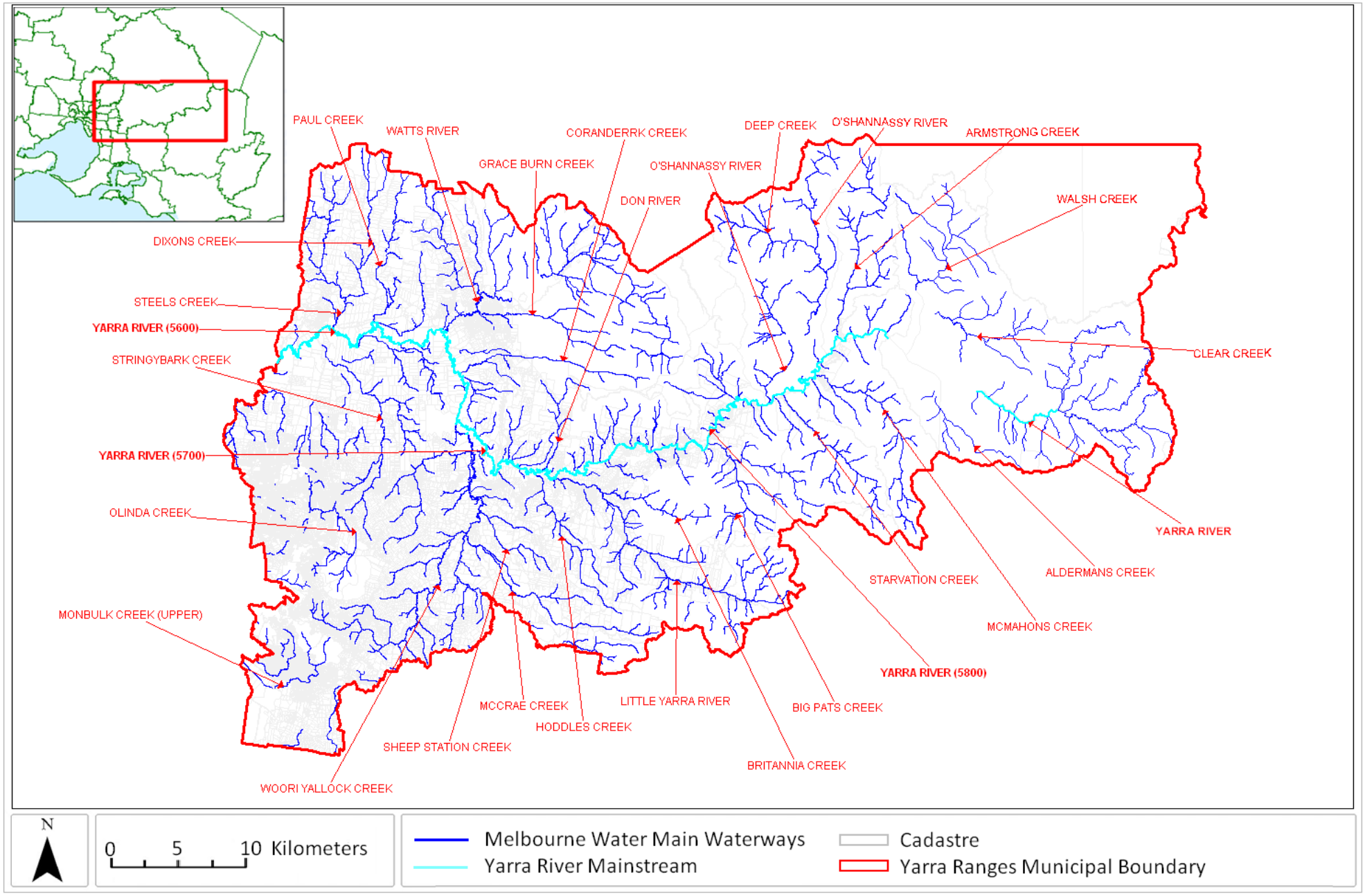


Figure A1 – Location of Major Rivers and Creeks in Yarra Ranges municipality[2]

Historic Storms and Floods

Significant floods (with high flood gauge levels and/or likely flooding consequences to property and infrastructure) to have occurred within the Shire of Yarra Ranges are as follows in the table below. It is rare that a storm will affect all catchments in the shire in the one event except in the most extreme situations. Results below highlighted in black indicate when either stream level rise was significant enough to cause riverine flooding or when rainfall was significant enough to cause flash flooding; while results in grey indicate either stream level rise or rainfall that was unlikely enough to contribute to flooding at or around the gauge location. These results have been included however to show the relationship between these catchments and others that were recorded to indicate flooding.

Event	Watts River Healesville (229144A) River Level	Yarra River Millgrove (229212A) River Level	Yarra River Coldstream (229653A) River Level	Yarra River Yarra Glen (229206A) River Level	Brushy Creek Mooroolbark (229249A) Creek Level or Rain Amount	Olinda Creek Lilydale Lake (229672A) Creek Level or Rain Amount	Bungalook Creek Montrose (228369A) Creek Level	Monbulk Creek Lysterfield (228229B) Creek Level or Rain Amount
Normal Water Level	0.50m	0.90m	1.00m	1.10m	0.17m	4.30m	0.00	1.10m
Minor Flood Class	2.6m	2.0m	4.0m	4.1m	N/A	Spillway 8.0m	Spillway 7.7m	Spillway 9.3m
Moderate Flood Class	3.1m	2.5m	5.1m	4.6m	N/A	Full Supply 8.0m	Full Supply 8.2m	1% AEP 10.0m
Major Flood Class	4.0m	3.0m	6.1m	5.0m	N/A	1% AEP 8.2m	1% AEP 8.49m	Full Supply 10.8m
1st December 1934	-	-	-	-	-	-	-	-
15th July 1952	-	-	-	-	-	-	-	-
4th October 1971	-	2.63m	-	-	-	-	-	-
8th November 1971	-	**3.13m**	-	-	-	-	-	-
17th August 1974	-	2.14m	-	-	-	-	-	-
19th October 1974	-	2.11m	-	-	-	-	-	-
23rd August 1975	-	2.12m	-	-	-	-	-	-
6th November 1975	-	2.17m	-	-	-	-	-	-
20th November 1978	-	1.70m	4.07m	-	-	-	-	-
29th June 1980	-	2.13m	5.24m	-	-	-	3.77m	-
21st August 1981	-	2.14m	4.54m	-	-	-	1.58m	-
4th July 1987	3.02m	0.79m	-	-	0.43m	-	0.15m	-
19th September 1984	-	1.91m	5.72m	-	-	-	**7.23m**	-
29th July 1987	-	1.21m	3.77m	-	**3.07m**	-	5.32m	-

Event	Watts River Healesville (229144A) River Level	Yarra River Millgrove (229212A) River Level	Yarra River Coldstream (229653A) River Level	Yarra River Yarra Glen (229206A) River Level	Brushy Creek Mooroolbark (229249A) Creek Level or Rain Amount	Olinda Creek Lilydale Lake (229672A) Creek Level or Rain Amount	Bungalook Creek Montrose (228369A) Creek Level	Monbulk Creek Lysterfield (228229B) Creek Level or Rain Amount
Normal Water Level	0.50m	0.90m	1.00m	1.10m	0.17m	4.30m	0.00	1.10m
10th June 1989	3.2m	1.45m	5.14m	-	1.83m	-	4.29m	-
31st July 1989	2.78m	1.35m	3.24m	-	1.28m	-	1.89m	-
27th October 1989	2.78m	1.83m	5.14m	-	1.34m	-	2.23m	-
25th August 1990	2.63m	1.63m	4.11m	-	0.65m	-	1.20m	-
5th September 1990	2.25m	1.74m	4.20m	-	1.0m	-	0.89m	-
19th September 1991	3.06m	1.75m	5.29m	-	1.17m	4.93m	2.35m	-
22nd September 1991	2.87m	2.07m	4.96m	-	1.0m	4.77m	1.98m	-
17th December 1991	3.11m	1.65m	4.01m	4.33m	-	5.19m	0.15m	-
22nd September 1992	2.87m	1.89m	4.72m	4.5m	1.57m	4.96m	-	-
29th September 1992	2.96m	1.80m	4.39m	4.45m	1.19m	4.83m	-	-
9th October 1992	3.18m	2.28m	5.53m	4.65m	1.19m	4.97m	2.68m	-
2nd September 1993	3.14m	1.76m	4.58m	4.44m	1.57m	4.6m	2.77m	-
15th September 1993	3.18m	2.58m	5.67m	4.57m	1.19m	4.59m	2.4m	-
5th November 1993	2.74m	1.82m	4.77m	4.51m	0.83m	4.74m	2.28m	-
27th December 1993	3.10m	1.46m	4.06m	4.39m	1.62m	5.15m	4.25m	-
6th August 1995	3.10m	1.90m	4.91m	4.52m	1.11m	4.88m	-	-
10th February 1996	3.39m	1.59m	4.34m	4.16m	1.11m	4.9m	2.32m	-
18th April 1996	3.19m	1.55m	4.39m	4.48m	1.09m	4.79m	2.26m	-
30th July 1996	**3.51m**	1.89m	5.96m	4.61m	1.4m	**5.55m**	6.19m	-
14th September 1996	2.79m	2.26m	4.91m	4.5m	0.94m	4.66m	1.56m	-
1st October 1996	3.07m	2.74m	5.43m	4.58m	1.34m	4.73m	2.21m	-
10th September 2000	2.75m	1.76m	4.83m	4.43m	0.86m	-	0.9m	-
7th November 2004	3.02m	1.56m	5.01m	4.59m	0.78m	1.47m	2.43m	-
13th November 2004	3.26m	1.78m	-	4.62m	0.93m	-	3.9m	-
3rd February 2005	3.14m	1.45m	3.61m	3.74m	-	-	5.32m	-
28th September 2009	1.93m	2.18m	4.79m	4.44m	0.83m	4.84m	1.66m	2.29m

Event	Watts River Healesville (229144A) River Level	Yarra River Millgrove (229212A) River Level	Yarra River Coldstream (229653A) River Level	Yarra River Yarra Glen (229206A) River Level	Brushy Creek Mooroolbark (229249A) Creek Level or Rain Amount	Olinda Creek Lilydale Lake (229672A) Creek Level or Rain Amount	Bungalook Creek Montrose (228369A) Creek Level	Monbulk Creek Lysterfield (228229B) Creek Level or Rain Amount
Normal Water Level	0.50m	0.90m	1.00m	1.10m	0.17m	4.30m	0.00	1.10m
5th September 2010	2.93m	2.22m	4.88m	4.57m	0.65m	4.46m	0.16m	1.57m
31st October 2010	3.49m	1.50m	4.69m	4.57m	1.94m	4.82m	2.35m	3.78m
28th November 2010	2.99m	1.55m	3.79m	4.43m	0.77m	4.59m	0.39m	2.28m
14th January 2011	2.67m	1.39m	3.59m	4.11m	2.0m	4.77m	2.44m	2.14m
5th February 2011	2.86m	1.68m	**5.99m**	**4.76m**	2.87m	5.43m	4.28m	**8.56m**
14th April 2011	2.81m	1.06m	3.96m	4.23m	0.48m	4.66m	1.17m	1.44m
30th September 2011	2.72m	1.53m	4.32m	4.34m	1.51m	4.88m	1.14m	1.97m
10th November 2011	3.18m	1.51m	3.98m	4.23m	2.85m	4.85m	1.34m	3.4m
27th November 2011	3.28m	1.87m	4.65m	4.56m	1.5m	5.11m	1.27m	4.05m
26th December 2011	3.12m	1.38m	3.50m	3.73m	2.15m	4.79m	1.18m	1.36m
22nd June 2012	2.78m	1.98m	5.14m	4.60m	1.27m	4.4m	1.0m	3.66m
2nd July 2012	3.22m	1.61m	4.67m	4.54m	1.73m	5.19m	1.15m	1.57m
19th August 2012	2.87m	1.54m	4.20m	4.30m	1.24m	4.69m	1.17m	1.37m
3th October 2016	2.68m	1.74m	4.14m	4.16m	1.46m	4.61m	1.13m	1.91m
29th December 2016	0.70m	0.84m	0.40m / 1 hr 1.27m	1.25m	42mm / 1hr 2.60m	33mm / 10mins 4.62m	57mm / 1 hr 2.48m	59mm / 1 hr 3.27m
5th February 2017	-	-	30mm / 3 hrs	-	26mm / 6 hrs	21mm / 3 hrs	21mm / 3 hrs	37mm / 3 hrs
1st December 2017	-	-	2mm / 30mins 3.88m	-	11mm / 15mins 1.88m	19mm / 30mins 4.78m	16mm / 30min 1.56m	12mm / 10mins 1.62m

Table A2 – Selection of Historical Flood Events within the Shire of Yarra Ranges

Historic Landslides (Landslip)

Significant landslides requiring some form of emergency response to have occurred within the Shire of Yarra Ranges are as follows in the table below.

Event	Location	Approx. Flow Length	Approx. Flow Width	Description	Map book Reference
1891	Mount Dandenong and Montrose	2.0km	50m	Occurred from the steep slopes of Mount Dandenong. A house and several outbuildings were destroyed by the debris flow. Two people were caught in the debris flow and one had to be rescued.	
October 1992	Blackwood Avenue, Warburton			Moved about 0.24m over 10 days in 1992 and raised the possibility of a dramatic failure occurring and the Yarra River being dammed. Emergency procedures were activated but closed off after several days when the movements slowed down. Road now permanently closed to traffic and there are currently no occupied buildings in the flow path. Four houses lie in close proximity to the edges of the landslide.	Melway 290 E3
1995	Charles Road, Lilydale	20m	1m	Involved the failure of water saturated fill slope impacting upon a neighbour's house and shed.	
1996	Hazelvale Road, Tecoma	80m	5m	Involved the failure of water saturated ground below absorption trenches destroying various outdoor structures and coming to rest against a house.	
July 1996	Mount Dandenong Tourist Road, Ferntree Gully	100m		Boulders and soil fell from cuttings onto the road, and where a fill slope failure flowed about 100m down-slope of the road	

Table A3 – Selection of Historical Landslide Events within the Shire of Yarra Ranges

Dam Spilling / Failure

Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within the Shire of Yarra Ranges. See Dam Failure in Section 3 of this plan for more information. Only dams with a storage capacity >100ML have been included in the list. Note that if the storage capacity is reached and water flows over the spillway, this is not to be referred to as a flow release or a storage breach or failure.

Dam Name / ID	Location	Owner	Watercourses Impacted	Dam Capacity	Full Supply Level	Map book Reference
Maroondah Reservoir	Maroondah Hwy, Healesville	Melbourne Water	Watts River > Yarra River	21,821ML	139.43m AHD	Melway 270 J4
O'Shannassy Reservoir	Road 1, McMahons Creek	Melbourne Water	O'Shannassy River > Yarra River	3,123ML	363.5m AHD	VicMap 6538 E6
Silvan Reservoir	Monbulk Road, Silvan	Melbourne Water	Olinda Creek > Yarra River	39,908ML	246.49m AHD	Melway 122 K3
Sugarloaf Reservoir	Ashmore Road, Christmas Hills	Melbourne Water	Sugarloaf Creek > Watsons Creek > Yarra River	93,411ML	178.00m AHD	Melway 273 E7
Upper Yarra Reservoir	Woods Point Road, Reefton	Melbourne Water	Yarra River	200,051ML	366.53m AHD	VicMap 6539 C6
Lake Muratore	Muratore Court, Gilderoy	Private	Saxton Creek > Little Yarra River	3,000ML	-	VicMap 6619 H12
5634/D15	Roger Road, Wandin North	Private	Little Stringybark Creek > Stringybark Creek	217ML	-	Melway 119 B4
5600/D7	Domaine Chandon on Maroondah Hwy, Coldstream	Private	Yarra River Tributary > Yarra River	200ML	-	Melway 276 D6
5600/D14	Hyde Park Road, Coldstream	Private	Yarra River Tributary > Yarra River	200ML	-	Melway 276 G11
5700/D1	Stratton Road, Gruyere	Private	Yarra River Tributary > Yarra River	194ML	-	Melway 283 K4
5600/D45	Healesville – Yarra Glen Road, Healesville	Private	Yarra River Tributary > Yarra River	150ML	-	Melway 277 E2
5740/D16	Macclesfield Road, Yellingbo	Private	Cockatoo Creek Tributary > Cockatoo Creek	150ML	-	Melway 305 H11
5756/D4	Holden Road, Silvan	Private	Ferndale Creek > Woori Yallock Creek	150ML	-	Melway 305 C12
5640/D32	Smedley Lane, Yarra Glen	Private	Steels Creek Tributary > Steels Creek	128ML	-	Melway 267 D4
5600/D13	St Huberts Road, Coldstream	Private	Lillyponds Creek Tributary > Lillyponds Creek	120ML	-	Melway 275 H9
5620/D2	Melba Hwy, Yering	Private	Stringybark Creek > Yarra River	120ML	-	Melway 275 B11

Dam Name / ID	Location	Owner	Watercourses Impacted	Dam Capacity	Full Supply Level	Map book Reference
5620/D30	Maroondah Hwy, Coldstream	Private	Lillyponds Creek Tributary > Lillyponds Creek	108ML	-	Melway 275 K9
5780/D30	Launching Place Rd, Hoddles Creek	Private	Hoddles Creek Tributary > Hoddles Creek	106ML	-	VicMap 6618 G10
5741/D11	Hansen Creek Rd, Hoddles Creek	Private	McCrae Creek	100ML	-	VicMap 6618 E13
5741/D6	Beenak Road, Hoddles Creek	Private	McCrae Creek	100ML	-	VicMap 6618/H14
5711/D12	Badger Ave, Badger Creek	Private	Boggy Creek > Badger Creek	100ML	-	Melway 278 F10
5600/D4	Tarrawarra Estate on Healesville – Yarra Glen Rd, Healesville	Private	Yarra River Tributary > Yarra River	100ML	-	Melway 277 B3
5660/D18	Healesville – Yarra Glen Rd, Tarrawarra	Private	Paul Creek > Yarra River	100ML	-	Melway 268 D11
5600/D9	Maroondah Hwy, Coldstream	Private	Lillyponds Creek Tributary > Lillyponds Creek	100ML	-	Melway 275 J8
5600/D5	Yering Station on Melba Hwy, Yering	Private	Stringybark Creek > Lilyponds Creek > Yarra River	100ML	-	Melway 275 B8

Table A4 – Melbourne Water Reservoirs that pose a risk to the Shire of Yarra Ranges from Dam Failure

Service Reservoirs located within the Municipality are listed below.

Service Reservoir Name	Location	Owner	Material	Reservoir Capacity	Map book Reference
Cresswell Reservoir	Maroondah Highway, Healesville	Melbourne Water	Concrete	4.50 ML	VicMap 6536 D3
Frogley Reservoir	Badger Weir Road, Badger Creek	Melbourne Water	Concrete	4.54 ML	VicMap 6536 E7
John's Hill Steel Tank	Trumpington Grove, Kallista	Melbourne Water	Steel	10.0 ML	Melway 125 A12
Lewis Hill Steel Tank	Queens Road, Silvan	Melbourne Water	Steel	33.0 ML	Melway 121 B8
Monbulk Steel Tank No.1	McCarthy Road, Silvan	Melbourne Water	Steel	4.96 ML	Melway 122 G10
Monbulk Steel Tank No. 2	McCarthy Road, Silvan	Melbourne Water	Steel	5.10 ML	Melway 122 G9
Montrose Reservoir	Claire View, Montrose	Melbourne Water	Concrete	9.5 ML	Melway 52 A6
Olinda Service Reservoir	Edinburgh Road, Lilydale	Melbourne Water	Concrete	50.0 ML	Melway 52 F1
Yarra Glen Concrete Tank	Mount Wise Road, Yarra Glen	Melbourne Water	Concrete	2.3 ML	Melway 266 G10

Table A5 – Melbourne Water Service Reservoirs in the Shire of Yarra Ranges

APPENDIX B – TYPICAL FLOOD PEAK TRAVEL TIMES

In using the information contained in this Appendix, consideration needs to be given to the time of travel of the flood peak. A flood on a 'dry' waterway will generally travel more slowly than a flood on a 'wet' waterway (e.g. The first flood after a dry period will travel more slowly than the second flood in a series of floods). Hence, recent flood history, soil moisture and forecast weather conditions all need to be considered when using the following information to direct flood response activities.

Note that flooding will start some time ahead of the time indicated by the following travel times – these are the time between the flood peaks at respective sites.

Where negative values are shown in the table below this indicates that a flood peak may be expected at the gauge downstream before a separate flood peak is experienced at the upstream gauge. This phenomenon may be due to the location of the thunderstorm passing through the catchment between the two gauges, or because of the urban environment found downstream causing floodwaters to enter the waterway quicker than those in a more rural setting upstream. Lastly this may be because of the existence of a retarding basin between the two gauges.

Typical Travel Times

Location From	Location To	Typical Travel Time	Flood Class	
YARRA RIVER				
Millgrove	Coldstream	Between 10 to 45 hours	Minor Flood	Inflows from Little Yarra River, Don River, Hoddles Creek, Woori Yallock Creek, Wandin Yallock Creek, Badger Creek and Watts River likely to significantly impact travel times to Coldstream
		Between 12 to 30 hours	Moderate Flood	
Coldstream	Yarra Glen	Between 6 to 36 hours	Minor Flood	Inflows from Pauls Creek and Steels Creek likely to significantly impact travel times to Yarra Glen
		Between 10 to 18 hours	Moderate Flood	
WATTS RIVER				
Maroondah Reservoir	Healesville	Between (-1) to 9 hours	Minor Flood	Flood peak likely to occur downstream first due to the existence of the Maroondah Reservoir unless the reservoir has been spilling for a number of hours to days already before the peak occurs.
		Between (-6) to 4 hours	Moderate Flood	
Grace Burn	Healesville	Between 6 to 11 hours	Minor Flood	
		Between 2 to 5 hours	Moderate Flood	
OLINDA CREEK				
Mount Evelyn	Lilydale Lake	Between 3 to 6 hours	N/A	
Lilydale Lake	Yering	Between 2 to 7 hours	N/A	

Table B1 – Typical Flood Travel Times between gauges on the Yarra River, Watts River and the Olinda Creek

Historical Travel Times

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class At:
YARRA RIVER				**Coldstream**

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class At:
19th November 1978	Millgrove	Coldstream	19 hours	Minor
29th June 1980	Millgrove	Coldstream	21 hours	Moderate
21st August 1981	Millgrove	Coldstream	40 hours	Minor
29th August 1981	Millgrove	Coldstream	20 hours	Minor
19th September 1984	Millgrove	Coldstream	18 hours	Moderate
9th August 1985	Millgrove	Coldstream	23 hours	Minor
11th June 1989	Millgrove	Coldstream	13 hours	Moderate
28th October 1989	Millgrove	Coldstream	30 hours	Moderate
YARRA RIVER				**Coldstream**
25th August 1990	Millgrove	Coldstream	10 hours	Minor
4th September 1990	Millgrove	Coldstream	26 hours	Minor
12th October 1990	Millgrove	Coldstream	16 hours	Minor
19th September 1991	Millgrove	Coldstream	29 hours	Moderate
22nd September 1991	Millgrove	Coldstream	21 hours	Minor
17th December 1991	Millgrove	Coldstream	25 hours	Minor
	Coldstream	Yarra Glen	25 hours	
13th September 1992	Millgrove	Coldstream	33 hours	Minor
	Coldstream	Yarra Glen	30 hours	
23rd September 1992	Millgrove	Coldstream	31 hours	Minor
	Coldstream	Yarra Glen	37 hours	
19th October 1992	Millgrove	Coldstream	14 hours	Moderate
	Coldstream	Yarra Glen	9 hours	
15th August 1993	Millgrove	Coldstream	31 hours	Minor
	Coldstream	Yarra Glen	41 hours	
3rd September 1993	Millgrove	Coldstream	31 hours	Minor
	Coldstream	Yarra Glen	22 hours	
9th September 1993	Millgrove	Coldstream	37 hours	Minor
	Coldstream	Yarra Glen	12 hours	
16th September 1993	Millgrove	Coldstream	18 hours	Moderate
	Coldstream	Yarra Glen	15 hours	
21st September 1993	Millgrove	Coldstream	35 hours	Minor
	Coldstream	Yarra Glen	13 hours	
6th November 1993	Millgrove	Coldstream	31 hours	Minor
	Coldstream	Yarra Glen	13 hours	
29th December 1993	Millgrove	Coldstream	20 hours	Minor
	Coldstream	Yarra Glen	27 hours	
13rd June 1995	Millgrove	Coldstream	34 hours	Minor
	Coldstream	Yarra Glen	17 hours	
8th August 1995	Millgrove	Coldstream	34 hours	Minor
	Coldstream	Yarra Glen	19 hours	
11th February 1996	Millgrove	Coldstream	29 hours	Minor
	Coldstream	Yarra Glen	28 hours	
18th April 1996	Millgrove	Coldstream	28 hours	Minor
	Coldstream	Yarra Glen	11 hours	
30th July 1996	Millgrove	Coldstream	9 hours	Moderate

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class At:
	Coldstream	Yarra Glen	10 hours	
15th September 1996	Millgrove	Coldstream	30 hours	Minor
	Coldstream	Yarra Glen	15 hours	
2nd October 1996	Millgrove	Coldstream	20 hours	Moderate
	Coldstream	Yarra Glen	15 hours	
11th September 2000	Millgrove	Coldstream	53 hours	Minor
	Coldstream	Yarra Glen	4 hours	
3rd November 2003	Millgrove	Coldstream	33 hours	Minor
	Coldstream	Yarra Glen	17 hours	
13th September 2004	Millgrove	Coldstream	39 hours	Minor
	Coldstream	Yarra Glen	32 hours	
YARRA RIVER				**Coldstream**
7th November 2004	Millgrove	Coldstream	27 hours	Minor
	Coldstream	Yarra Glen	7 hours	
29th September 2009	Millgrove	Coldstream	42 hours	Minor
	Coldstream	Yarra Glen	29 hours	
6th September 2010	Millgrove	Coldstream	50 hours	Minor
	Coldstream	Yarra Glen	16 hours	
5th February 2011	Millgrove	Coldstream	12 hours	Moderate
	Coldstream	Yarra Glen	18 hours	
23rd June 2011	Millgrove	Coldstream	39 hours	Minor
	Coldstream	Yarra Glen	15 hours	
1st October 2011	Millgrove	Coldstream	45 hours	Minor
	Coldstream	Yarra Glen	29 hours	
28th November 2011	Millgrove	Coldstream	49 hours	Minor
	Coldstream	Yarra Glen	29 hours	
23rd June 2012	Millgrove	Coldstream	35 hours	Moderate
	Coldstream	Yarra Glen	22 hours	
3rd July 2012	Millgrove	Coldstream	29 hours	Minor
	Coldstream	Yarra Glen	19 hours	
11th August 2012	Millgrove	Coldstream	45 hours	Minor
	Coldstream	Yarra Glen	16 hours	
3rd October 2016	Millgrove	Coldstream	43 hours	Minor
	Coldstream	Yarra Glen	24 hours	
WATTS RIVER				**Healesville**
25th August 1990	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Minor
19th September 1991	Maroondah Reservoir	Healesville	3 hours	Minor
17th December 1991	Maroondah Reservoir	Healesville	3 hours	Moderate
22nd September 1992	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Minor
9th October 1992	Maroondah Reservoir	Healesville	0 hours	Moderate

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class At:
2nd September 1993	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Moderate
15th October 1993	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Moderate
5th November 1993	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Minor
27th December 1993	Maroondah Reservoir	Healesville	Healesville peaked 7 hours before Maroondah Reservoir	Moderate
6th August 1995	Maroondah Reservoir	Healesville	Healesville peaked 6 hours before Maroondah Reservoir	Moderate
10th February 1996	Maroondah Reservoir	Healesville	4 hours	Moderate
17th April 1996	Maroondah Reservoir	Healesville	1 hour	Moderate
30th July 1996	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Moderate
14th September 1996	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Minor
1st October 1996	Maroondah Reservoir	Healesville	4 hours	Minor
11th September 2000	Maroondah Reservoir	Healesville	8 hours	Minor
	Grace Burn	Healesville	11 hours	Minor
7th November 2004	Maroondah Reservoir	Healesville	Healesville peaked 9 hours before Maroondah Reservoir	Moderate
	Grace Burn	Healesville	2 hours	
WATTS RIVER				**Healesville**
13th November 2004	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Moderate
	Grace Burn	Healesville	3 hours	
3rd February 2005	Grace Burn	Healesville	5 hours	Moderate
5th September 2010	Maroondah Reservoir	Healesville	9 hours	Minor
1st November 2010	Maroondah Reservoir	Healesville	Healesville peaked 4 hours before Maroondah Reservoir	Moderate
5th February 2011	Maroondah Reservoir	Healesville	Healesville peaked 1 hour before Maroondah Reservoir	Minor
14th April 2011	Maroondah Reservoir	Healesville	3 hours	Minor
1st October 2011	Maroondah Reservoir	Healesville	5 hours	Minor
10th November 2011	Maroondah Reservoir	Healesville	1 hour	Moderate
27th November 2011	Maroondah Reservoir	Healesville	1 hour	Moderate

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class At:
25th December 2011	Maroondah Reservoir	Healesville	Healesville peaked 2 hours before Maroondah Reservoir	Moderate
22nd June 2012	Maroondah Reservoir	Healesville	1 hour	Minor
	Grace Burn	Healesville	6 hours	Minor
2nd July 2012	Maroondah Reservoir	Healesville	Healesville peaked 3 hours before Maroondah Reservoir	Moderate
	Grace Burn	Healesville	2 hours	
18th August 2012	Maroondah Reservoir	Healesville	2 hours	Minor
	Grace Burn	Healesville	8 hours	
OLINDA CREEK				
5th July 1991	Mount Evelyn	Lilydale Lake	4 hours	N/A
16th December 1991	Mount Evelyn	Lilydale Lake	5 hours	N/A
27th December 1993	Mount Evelyn	Lilydale Lake	3 hours	N/A
30th July 1996	Mount Evelyn	Lilydale Lake	3 hours	N/A
5th February 2011	Mount Evelyn	Lilydale Lake	3 hours	N/A
	Lilydale Lake	Yering	2 hours	N/A
16th February 2011	Mount Evelyn	Lilydale Lake	4 hours	N/A
	Lilydale Lake	Yering	7 hours	N/A
27th November 2011	Mount Evelyn	Lilydale Lake	4 hours	N/A
	Lilydale Lake	Yering	7 hours	N/A
2nd July 2012	Mount Evelyn	Lilydale Lake	6 hours	N/A
	Lilydale Lake	Yering	3 hours	N/A
3rd October 2016	Mount Evelyn	Lilydale Lake	6 hours	N/A
	Lilydale Lake	Yering	Less than 1 hour	N/A
29th December 2016	Mount Evelyn	Lilydale Lake	6 hours	N/A
	Lilydale Lake	Yering	2 hours	N/A

Table B2 – Historical Flood Travel Times between gauges on the Yarra River, Watts River and the Olinda Creek

APPENDIX C1 – UPPER YARRA RIVER (REEFTON TO HEALESVILLE) FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along the Yarra River from Reefton to Healesville

Property					
Properties	**142**				
Residential	26				
Commercial	7	Shops along Warburton Highway, Warburton			
Industrial	0				
Public Land	3				
Rural	106				
Community Infrastructure					
Schools / Colleges	1	Warburton Christian School			
Essential Infrastructure					
Major Roads	4	Don Road, Maroondah Hwy, Warburton Hwy and Woods Point Road			
Bus Routes	3	683, 684 and 685			
Sewerage Facilities	10	5 Pumping Stations and 5 Emergency Relief Points			
Levees	1	Ronald Grove, Millgrove			
Tourism / Recreation					
Caravan Parks	2	Doon Reserve Caravan Park; and Warburton Caravan Park			
Recreation Facilities	3	Everard Park; Warburton Reserve; Yarra River Walking Trail			
Government Boundaries					
Local Gov't Areas	1	Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	2	Upper Yarra & Healesville	FRV District	0	

Table C1.1 – Consequence Summary of 1% AEP flood along the Yarra River from Reefton to Healesville

The Yarra River flows from the east, entering the Upper Yarra Reservoir at Reefton before continuing west through McMahons Creek. East Warburton is the first township based on the banks of the river and the first opportunity for impacts from flooding. The river continues west through the towns of Warburton, Millgrove, Wesburn, Yarra Junction & Launching Place with each location providing risks from flooding. Landslips along the Yarra River in Warburton have the potential to cause localised flooding upstream in Warburton by damming the river at the landslip point (Melway 290 E3). Little Yarra River joins the Yarra River in Yarra Junction with significant flows possible contributing to larger flooding in the floodplains at Yarra Junction where a number of rural properties and Doon Road Caravan Park are located. Upstream in Warburton, the Warburton Caravan Park on the north bank of the Yarra River is also at risk from flooding during large events. Flooding has the potential to last a number of days, especially on the floodplain around Settlement Road. The Yarra River continues through Woori Yallock where the river takes a northward turn and flows through a

predominantly rural setting. On this section of the river, little infrastructure resides until crossing the Maroondah Highway at Everard Park in Healesville. For more information on flooding in the area, see mapping in **Appendix F**.

Gauges and Warnings

Warnings are available for flooding expected along the Yarra River at Millgrove and Coldstream. Flood class levels for the Millgrove and Coldstream gauges are detailed in table C1.3 and are used in the issuing of a flood warning for the Yarra River to Millgrove and Yarra River Millgrove to Coldstream. Other level / flood gauges within the Upper Yarra River catchment are also contained within table C1.2.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Armstrongs Creek u/s Diversion Weir	229104C	East bank of the creek, 200m upstream of Armstrong Creek East branch convergence	✓			VicMap 6538 K1
Cambarville	586067	Camberville Picnic Area	✓		✓	VicMap 6455 B8
Don River at Don Valley	229220A	East bank of the River, northern side of the Dalry Road bridge	✓			VicMap 6536 F12
Hoddles Creek at Launching Place	229224A	East bank of the creek, south side of the Warburton Hwy bridge	✓			Melway 287 F6
Little Yarra River at Yarra Junction	229214A	South bank of the river, west side of Lowes Road	✓			Melway 288 F7
McMahons Creek u/s Diversion Weir	229106A	West wide of the creek, McMahons Creek Road, 500m d/s of Observation Road	✓			VicMap 6539 B11
Mt Donna Buang	586075	100m from Mt Boobyalla walking trail gate, Mt Donna Buang		✓	✓	Melway 290 G7
O'Shannassy River d/s Reservoir	229111A	West bank of the river 1km downstream of the reservoir	✓			VicMap 6538 E7
Starvation Creek u/s Diversion Wier	229109A	West side of the creek near Road 13, 500m beyond Starvation Creek Road	✓	✓		VicMap 6538 J15
Upper Yarra Reservoir	229102A	West bank of the outlet at the Pumping Station	✓	✓		VicMap 6539 C6
Warburton	586193	50 Old Warburton Road		✓		Melway 290 D7
Woori Yallock at Woori Yallock	229215B	East side of the creek at the Warburton Trail crossing	✓	✓		Melway 286 A7
Yarra River at Coldstream	229653A	South bank of the river at 771 Maroondah Hwy	✓	✓		Melway 277 D4
Yarra River d/s Doctors Creek, Reefton	229103A	South bank of the river at Upper Yarra Dam Camping ground	✓			VicMap 6539 C5
Yarra River at Millgrove	229212A	South bank of the river on Dee Road, 100m off the Warburton Hwy	✓			Melway 289 D4
Yarra River at Warburton	229404A	West bank of the river, northern side of the Warburton Hwy bridge	✓			Melway 290 D4
Yarra River at Yarra Junction	229234A	Doon Reserve Caravan Park at the end of Doon Road	✓			Melway 288 C5
Yarra River at Launching Place	229226A	Don Road, Launching Place	Staff Gauge Only			Melway 287 H6

Table C1.2 – Gauges within the Upper Yarra River catchment from Reefton to Coldstream

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

There are currently two flood warning gauges on the Yarra River that could be used to assist with public safety through the issue of flood warnings from Reefton to Coldstream. These are at Millgrove and Coldstream.

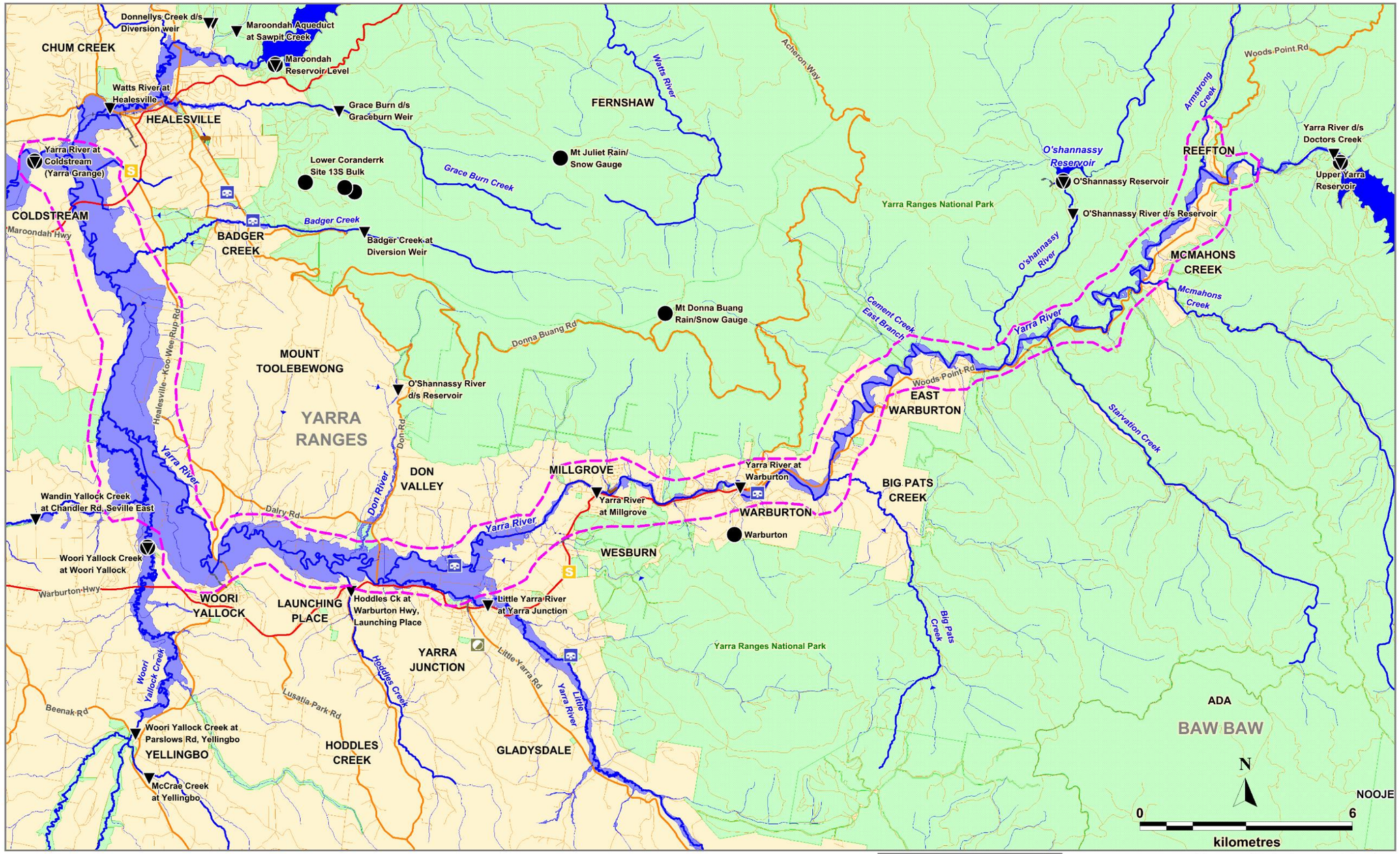
Gauge	Flood Class Level		
	Minor	Moderate	Major
Yarra River at Coldstream	4.0m	5.1m	6.1m
Yarra River at Millgrove	2.0m	2.5m	3.0m

Table C1.3 – Gauges with established Flood Class Levels for the Yarra River from Reefton to Coldstream

At these sites on the Yarra River, the Bureau of Meteorology (the Bureau) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website(**http://www.bom.gov.au/vic/warnings/index.shtml**). While Yarra Ranges Council monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

The Bureau does not issue formal flood warnings for other creeks and rivers in the Upper Yarra Catchment, generally due to their rapid response to rainfall, giving limited time for a flood warning.

Area Map of Flood Risk within the Upper Yarra River catchment



SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

Areas of flood risk along the Yarra River (Reefton to Coldstream)

- Area of Interest
- 1% AEP Riverine Flood Extent
- Waterbody
- Melbourne Water Retarding Basin
- Area Boundary for this Appendix
- Levee / Embankment
- River / Creek
- Melbourne Water Underground Drain
- Caravan Park
- Municipal Depot
- VicSES Unit
- Stream Level Gauge
- Rain Gauge

Figure C1 – Areas of flood risk along the Yarra River from Reefton to Coldstream in the Shire of Yarra Ranges

Properties at Flood Risk

Properties listed in the table below are at risk from flooding. As more intelligence becomes available, this list may grow. This table has been populated based on modelling work as part of the Yarra River flood mapping (Melbourne Water and S.P. Goh & Associates, November 2010) flood mapping and risk assessment program.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding during a 1% AEP event along the Yarra River from Reefton to Healesville

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
15	Upper Yarra Dam Road	Reefton	Yarra River	Riverine
20	Upper Yarra Dam Road	Reefton	Yarra River	Riverine
2055	Warburton – Woods Point Road	Reefton	Yarra River	Riverine
15	Wombat Crescent	East Warburton	Yarra River	Riverine
17	Wombat Crescent	East Warburton	Yarra River	Riverine
21	Wombat Crescent	East Warburton	Yarra River	Riverine
1	Angers Drive	East Warburton	Yarra River	Riverine
2	Angers Drive	East Warburton	Yarra River	Riverine
3	Angers Drive	East Warburton	Yarra River	Riverine
6	Angers Drive	East Warburton	Yarra River	Riverine
7	Angers Drive	East Warburton	Yarra River	Riverine
15	Armitage Avenue	East Warburton	Yarra River	Riverine
25	Armitage Avenue	East Warburton	Yarra River	Riverine
35	Armitage Avenue	East Warburton	Yarra River	Riverine
45	Armitage Avenue	East Warburton	Yarra River	Riverine
55	Armitage Avenue	East Warburton	Yarra River	Riverine
57	Armitage Avenue	East Warburton	Yarra River	Riverine
59	Armitage Avenue	East Warburton	Yarra River	Riverine
61	Armitage Avenue	East Warburton	Yarra River	Riverine
63	Armitage Avenue	East Warburton	Yarra River	Riverine
65	Armitage Avenue	East Warburton	Yarra River	Riverine
67	Armitage Avenue	East Warburton	Yarra River	Riverine
20	Hazelwood Road	East Warburton	Yarra River	Riverine
22	Hazelwood Road	East Warburton	Yarra River	Riverine
24	Hazelwood Road	East Warburton	Yarra River	Riverine
26	Hazelwood Road	East Warburton	Yarra River	Riverine
4	Woods Point Road	Warburton	Yarra River	Riverine
6-12	Woods Point Road	Warburton	Yarra River	Riverine
14	Woods Point Road	Warburton	Yarra River	Riverine
16	Woods Point Road	Warburton	Yarra River	Riverine
18	Woods Point Road	Warburton	Yarra River	Riverine
20	Woods Point Road	Warburton	Yarra River	Riverine
21	Woods Point Road	Warburton	Yarra River	Riverine

Properties at risk from Flooding during a 1% AEP event along the Yarra River from Reefton to Healesville				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
30	Woods Point Road	Warburton	Yarra River	Riverine
165	Woods Point Road	East Warburton	Yarra River	Riverine
167	Woods Point Road	East Warburton	Yarra River	Riverine
169	Woods Point Road	East Warburton	Yarra River	Riverine
171	Woods Point Road	East Warburton	Yarra River	Riverine
173	Woods Point Road	East Warburton	Yarra River	Riverine
175	Woods Point Road	East Warburton	Yarra River	Riverine
177	Woods Point Road	East Warburton	Yarra River	Riverine
181	Woods Point Road	East Warburton	Yarra River	Riverine
185	Woods Point Road	East Warburton	Yarra River	Riverine
187	Woods Point Road	East Warburton	Yarra River	Riverine
189	Woods Point Road	East Warburton	Yarra River	Riverine
191	Woods Point Road	East Warburton	Yarra River	Riverine
200	Woods Point Road	East Warburton	Yarra River	Riverine
202	Woods Point Road	East Warburton	Yarra River	Riverine
204	Woods Point Road	East Warburton	Yarra River	Riverine
210	Woods Point Road	East Warburton	Yarra River	Riverine
212	Woods Point Road	East Warburton	Yarra River	Riverine
214	Woods Point Road	East Warburton	Yarra River	Riverine
218	Woods Point Road	East Warburton	Yarra River	Riverine
270	Woods Point Road	East Warburton	Yarra River	Riverine
356	Woods Point Road	East Warburton	Yarra River	Riverine
358	Woods Point Road	East Warburton	Yarra River	Riverine
360	Woods Point Road	East Warburton	Yarra River	Riverine
364	Woods Point Road	East Warburton	Yarra River	Riverine
365	Woods Point Road	East Warburton	Yarra River	Riverine
370	Woods Point Road	East Warburton	Yarra River	Riverine
391	Woods Point Road	East Warburton	Yarra River	Riverine
435	Woods Point Road	East Warburton	Yarra River	Riverine
3	Graham Road	East Warburton	Yarra River	Riverine
1	George Road	East Warburton	Yarra River	Riverine
2	George Road	East Warburton	Yarra River	Riverine
210	Riverside Drive	Warburton	Yarra River	Riverine
270	Riverside Drive	Warburton	Yarra River	Riverine
20	Kellys Road	Warburton	Yarra River	Riverine
24	Kellys Road	Warburton	Yarra River	Riverine
34	Kellys Road	Warburton	Yarra River	Riverine
36	Kellys Road	Warburton	Yarra River	Riverine
40	Kellys Road	Warburton	Yarra River	Riverine
3305	Warburton Highway	Warburton	Yarra River	Riverine
3315	Warburton Highway	Warburton	Yarra River	Riverine
3331	Warburton Highway	Warburton	Yarra River	Riverine
3335	Warburton Highway	Warburton	Yarra River	Riverine
3/3395	Warburton Highway	Warburton	Yarra River	Riverine

Properties at risk from Flooding during a 1% AEP event along the Yarra River from Reefton to Healesville				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	**Street**	**Suburb**	**Along Melbourne Water Watercourse**	**Flood Risk Type**
3405A	Warburton Highway	Warburton	Yarra River	Riverine
3455-3457	Warburton Highway	Warburton	Yarra River	Riverine
5/38	Dammans Road	Warburton	Yarra River	Riverine
6/38	Dammans Road	Warburton	Yarra River	Riverine
29	Thomas Avenue	Warburton	Yarra River	Riverine
19	Ronald Grove	Millgrove	Yarra River	Riverine
20	Ronald Grove	Millgrove	Yarra River	Riverine
21	Ronald Grove	Millgrove	Yarra River	Riverine
22	Ronald Grove	Millgrove	Yarra River	Riverine
23	Ronald Grove	Millgrove	Yarra River	Riverine
24	Ronald Grove	Millgrove	Yarra River	Riverine
25	Ronald Grove	Millgrove	Yarra River	Riverine
26	Ronald Grove	Millgrove	Yarra River	Riverine
27	Ronald Grove	Millgrove	Yarra River	Riverine
28	Ronald Grove	Millgrove	Yarra River	Riverine
29	Ronald Grove	Millgrove	Yarra River	Riverine
30	Ronald Grove	Millgrove	Yarra River	Riverine
31	Ronald Grove	Millgrove	Yarra River	Riverine
32	Ronald Grove	Millgrove	Yarra River	Riverine
34	Ronald Grove	Millgrove	Yarra River	Riverine
35	Ronald Grove	Millgrove	Yarra River	Riverine
36	Ronald Grove	Millgrove	Yarra River	Riverine
34A	River Road	Millgrove	Yarra River	Riverine
38	Dee Road	Millgrove	Yarra River	Riverine
39	Dee Road	Millgrove	Yarra River	Riverine
110	Station Road	Wesburn	Yarra River	Riverine
160	Station Road	Wesburn	Yarra River	Riverine
65	Lowes Road	Yarra Junction	Yarra River	Riverine
70	Lowes Road	Yarra Junction	Yarra River	Riverine
115	Lowes Road	Yarra Junction	Yarra River	Riverine
150A	Settlement Road	Yarra Junction	Yarra River	Riverine
155	Settlement Road	Yarra Junction	Yarra River	Riverine
200	Settlement Road	Yarra Junction	Yarra River	Riverine
210	Settlement Road	Yarra Junction	Yarra River	Riverine
215	Settlement Road	Yarra Junction	Yarra River	Riverine
250	Settlement Road	Yarra Junction	Yarra River	Riverine
270	Settlement Road	Yarra Junction	Yarra River	Riverine
280	Settlement Road	Yarra Junction	Yarra River	Riverine
30	Doon Road	Yarra Junction	Yarra River	Riverine
55	Doon Road	Yarra Junction	Yarra River	Riverine
60	Doon Road	Yarra Junction	Yarra River	Riverine
90	Doon Road	Yarra Junction	Yarra River	Riverine
125	Doon Road	Yarra Junction	Yarra River	Riverine
140	Doon Road	Yarra Junction	Yarra River	Riverine

Properties at risk from Flooding during a 1% AEP event along the Yarra River from Reefton to Healesville				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
150	Doon Road	Yarra Junction	Yarra River	Riverine
200	Doon Road	Yarra Junction	Yarra River	Riverine
140	Barak Drive	Launching Place	Yarra River	Riverine
2170	Warburton Highway	Launching Place	Yarra River	Riverine
2205	Warburton Highway	Launching Place	Yarra River	Riverine
2005	Don Road	Don Valley	Yarra River	Riverine
2025	Don Road	Don Valley	Yarra River	Riverine
2035	Don Road	Don Valley	Yarra River	Riverine
2045	Don Road	Don Valley	Yarra River	Riverine
2055	Don Road	Don Valley	Yarra River	Riverine
2065	Don Road	Don Valley	Yarra River	Riverine
2085	Don Road	Don Valley	Yarra River	Riverine
49	Cairncroft Avenue	Launching Place	Yarra River	Riverine
195	Dalry Road	Launching Place	Yarra River	Riverine
95	Allsops Road	Launching Place	Yarra River	Riverine
1185	Healesville-Koo Wee Rup Road	Launching Place	Yarra River	Riverine
195	Old Warburton Highway	Woori Yallock	Yarra River	Riverine
265	Old Warburton Highway	Woori Yallock	Yarra River	Riverine
534-662	Healesville-Koo Wee Rup Road	Healesville	Yarra River	Riverine
1A	Maroondah Highway	Healesville	Yarra River	Riverine
103	Donovans Road	Healesville	Yarra River	Riverine

Total
142

Table C1.4 – Properties at risk of flooding along the Yarra River from Reefton to Healesville in the Shire of Yarra Ranges

Isolation

East Warburton may be cut off from Warburton and Yarra Junction if Woods Point Road becomes flooded, if this occurs the only sealed access in or out will be via Woods Point Road to the east. Access may be cut for periods up to 36 hours. In the unlikely event that the Warburton Highway in Launching Place is cut by floodwaters, direct access to metropolitan Melbourne for the region will be restricted for periods up to 72 hours. Warburton Highway also has the potential to be cut by the Little Yarra River in Yarra Junction. In this event, it is expected that Yarra Junction-Noojee Road (Little Yarra Road) remain open. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services http://ptv.vic.gov.au/live-travel-updates/ . A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

A **Levee** exists in Millgrove along **Ronald Grove** which is designed to protect to the 1% AEP (100yr ARI) flood level. The Levee protects 16 properties along Ronald Grove. Apart from the roads outlined below, all other essential infrastructure and services areas along the Yarra River around

East Warburton, Warburton, Millgrove, Wesburn, Yarra Junction and Launching Place are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding around Warburton, Millgrove, Yarra Junction, Launching Place & Woori Yallock. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely impacted in a 1% AEP event
• Woods Point Road at Reefton, McMahons Creek, East Warburton and in Warburton at Acheron Way Intersection
• Warburton Hwy, Launching Place between Don Road and Corduroy Road
• Don Road, Launching Place
• Maroondah Highway, Healesville at Everard Park

Table C1.5 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads likely flooded in a 1% AEP (100yr ARI) event			
EAST WARBURTON	**MILLGROVE**	**WARBURTON**	**WOORI YALLOCK**
• Armitage Avenue	• Dee Road	• Brett Road	• Haggards Lane
• Cement Creek Road	• McKenzie-King Drive	• Dammans Road	**YARRA JUNCTION**
• Hazelwood Road	• Ronald Grove	• Kellys Road	• Corduroy Road
• Whitegum Drive	• Whinwell Street	• Riverside Drive	• Lowes Road
LAUNCHING PLACE	**REEFTON**	• Thomas Avenue	• Settlement Road
• Barak Drive	• Upper Yarra Dam Road	**WESBURN**	
• Doon Road		• Gairns Road	
		• Station Road	

Table C1.6 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

Levees

Melbourne Water Levee	Reach	Side	Levee Height	Levee Length	Levee Shape	Levee Material	Houses in Flow Path	Melway Reference
Yarra River, Millgrove	Ronald Grove	North	0.5 – 2	0.5m	Trap	Earth	16	289E3

Table C1.7 – Melbourne Water Levees in the Upper Yarra River Catchment in the Yarra Ranges

No formal Pumping Stations or Retarding Basins exist along the Yarra River around East Warburton, Warburton, Millgrove, Wesburn, Yarra Junction and Launching Place.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located along the Yarra River between Reefton and Healesville is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Dammans Road	Yarra River	North	Yarra Valley Water	Dammans Road, Warburton	290 A4
Scotchmans Crescent	Scotchmans Creek	South Side of Yarra River	Yarra Valley Water	Scotchmans Crescent and Warburton Highway, Warburton	289 K5
Lincoln Road	Yarra River	North	Yarra Valley Water	Lincoln Road and Riverturn Lane, Warubrton	289 H4
Cairncroft Avenue	Yarra River	South	Yarra Valley Water	Cairncroft Avenue, Launching Place	287 C5
Healesville L.T.P Influent	Picanniny Creek	East side of Yarra River	Yarra Valley Water	Yarra Valley Water Healesville Purification Plant	277 J5

Table C1.8 – Sewer Pumping Stations along the Yarra River between Reefton and Healesville in the Shire of Yarra Ranges

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along the Yarra River that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Yarra River	South	Yarra Valley Water	Thomas Avenue, Warburton	290 A4
Yarra River	North	Yarra Valley Water	Riverturn Lane, Warburton	289 H4
Yarra River	South	Yarra Valley Water	55 Cavanagh Road, Wesburn	288 K2
Yarra River	South	Yarra Valley Water	Cairncroft Avenue, Launching Place	287 C5
Woori Yallock Main Drain	South Side of Yarra River	Yarra Valley Water	Warburton Trail, Woori Yallock	286 G10

Table C1.9 – Sewer Emergency Relief Points along the Yarra River between Reefton and Coldstream in the Shire of Yarra Ranges

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Yarra River at various river heights between Reefton and Coldstream. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Yarra River at Warburton
- Yarra River at Millgrove
- Yarra River at Coldstream

FLOOD INTELLIGENCE CARD – WARBURTON GAUGE, YARRA RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**West bank of the river, northern side of the Warburton Hwy bridge**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229404A**
STREAM:	**Yarra River**
GAUGE NUMBER:	**229404A**
GAUGE ZERO:	**148.55m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**290 D4**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**2.04m (5th September 2010)**

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.0m		**Community Infrastructure Likely Flooded** • Warburton Caravan Park at 30 Woods Point Road, Warburton starts flooding	
2.04m	5th September 2010 Flood Level Peak		
3.0m		**Community Infrastructure Likely Flooded** • Yarra River Walking Trail at Warburton Christian School flooded **Water Over Road** • Kellys Road, Warburton	
3.5m		**Community Infrastructure Likely Flooded** • Warburton Christian School, Warburton Hwy, Warburton Sports Grounds begins flooding	
6.24m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **82 Properties in Total** • 15 & 20 Upper Yarra Dam Road, Reefton • 2005 Warburton – Woods Point Road, Reefton • 15, 17 & 21 Wombat Crescent, East Warburton	

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 1, 2, 3, 6, & 7 Angers Drive, East Warburton • 15, 25, 35, 45, 55, 57, 59, 61, 63, 65 & 67 Armitage Avenue, East Warburton • 20, 22, 24 & 26 Hazelwood Road, East Warburton • 165, 167, 169, 171, 173, 175, 177, 181, 185, 187, 189, 191, 200, 202, 204, 210, 212, 214, 218, 270, 356, 358, 360, 364, 365, 370, 391 & 435 Woods Point Road, East Warburton • 4, 6-12, 14, 16, 18, 20, 21 & 30 Woods Point Road, Warburton • 3 Graham Road, East Warburton • 1 & 2 George Road, East Warburton • 210 & 270 Riverside Drive, Warburton • 20, 24, 34, 36 & 40 Kellys Road, Warburton • 3305, 3315, 3331, 3335, 3/3395, 3405A & 3455-3457 Warburton Highway, Warburton • Units 5-6/38 Dammans Road, Warburton • 29 Thomas Avenue, Warburton **Community Infrastructure Likely Flooded** • Warburton Caravan Park at 30 Woods Point Road, Warburton • Warburton Reserve at 3455-3457 Warburton Hwy, Warburton **Essential Infrastructure Likely Impacted** • Sewer Pumping Stations located on Dammans Road, Scotchmans Cres, and Lincoln Road in Warburton • Sewer Emergency Relief Points located on Thomas Avenue and Riverturn Lane in Warubrton **Water Over Road** • Upper Yarra Dam Road, Reefton • Whitegum Drive, East Warburton • Cement Creek Road, East Warburton • Armitage Avenue, East Warburton • Hazelwood Road, East Warburton • Woods Point Road, East Warburton • Riverside Drive, Warburton • Kellys Road, Warburton • Woods Point Road, Warburton at Acheron Way Intersection • Dammans Road, Warburton • Brett Road, Warburton • Thomas Avenue, Warburton	

Table C1.10 – Breakdown of likely consequences at various Warburton gauge level heights along the Yarra River with operational considerations

FLOOD INTELLIGENCE CARD – MILLGROVE GAUGE, YARRA RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**South bank of the river on Dee Road, 100m off the Warburton Hwy**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229212A**
STREAM:	**Yarra River**
GAUGE NUMBER:	**229212A**
GAUGE ZERO:	**124.76m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**289 D4**
MINOR:	**2.0m**
MODERATE:	**2.5m**
MAJOR	**3.0m**
LEVEE HEIGHT:	**8.0m**
HIGHEST RECORDED FLOOD:	**3.13m (8th November 1971)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.0m	**MINOR FLOOD LEVEL**		
2.1m		**Community Infrastructure Likely Flooded** • Doon Reserve Caravan Park at 200 Doon Road, Yarra Junction starts flooding	
2.5m	**MODERATE FLOOD LEVEL**		
2.74m	1st October 1996 Flood Level Peak		
3.0m	**MAJOR FLOOD LEVEL**		
3.13m	8th November 1971 Flood Level Peak		

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
6.84m	1% AEP (100yr ARI) Flood Level (Major)	• Note: Apart from the Levee in Millgrove and the properties located on Ronald Grove, it is not known at what level all other infrastructure contained below starts being flooded **Properties at Flood Risk** **57 Properties in Total** • 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35 & 36 Ronald Grove, Millgrove • 34A River Road, Millgrove • 38 & 39 Dee Road, Millgrove • 110 & 160 Station Road, Wesburn • 65, 70 & 115 Lowes Road, Yarra Junction • 150A, 155, 200, 210, 215, 250, 270 & 280 Settlement Road, Yarra Junction • 30, 55, 60, 90, 125, 140, 150 & 200 Doon Road, Yarra Junction • 140 Barak Drive, Launching Place • 2170 & 2205 Warburton Highway, Launching Place • 2005, 2025, 2035, 2045, 2055, 2065 & 2085 Don Road, Don Valley • 49 Cairncroft Avenue, Launching Place • 195 Dalry Road, Launching Place • 95 Allsops Road, Launching Place • 1185 Healesville-Koo Wee Rup Road, Launching Place • 195 & 265 Old Warburton Highway, Woori Yallock **Essential Infrastructure Likely Impacted** • Bus Route 683 along Warburton Highway at Launching Place and Warburton • Height of Levee at Ronald Grove, Millgrove. No freeboard at this height. • Sewer Pumping Station located on Cairncroft Avenue, Launching Place • Sewer Emergency Relief Points located on Cavanagh Road, Wesburn; Cairncroft Avenue, Launching Place; and on the Warburton Trail in Woori Yallock **Water Over Road** • McKenzie-King Drive Bridge, Millgrove • Dee Road, Millgrove • Whinwell Street, Millgrove • Gairns Road, Wesburn • Station Road, Wesburn • Lowes Road, Yarra Junction • Settlement Road, Yarra Junction • Corduroy Road, Yarra Junction • Doon Road, Launching Place • Warburton Hwy, Launching Place between Don Road and Corduroy Road • Don Road, Launching Place • Haggards Lane, Woori Yallock	

Table C1.11– Breakdown of likely consequences at various Millgrove gauge level heights along the Yarra River with operational considerations

FLOOD INTELLIGENCE CARD – COLDSTREAM GAUGE, YARRA RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**South bank of the river at 771 Maroondah Hwy, Coldstream**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229653A**
STREAM:	**Yarra River**
GAUGE NUMBER:	**229653A**
GAUGE ZERO:	**69.01m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**277 D4**
MINOR:	**4.0m**
MODERATE:	**5.14m**
MAJOR	**6.1m**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**6.00m (6th February 2011)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.0m	**MINOR FLOOD LEVEL**	**Community Infrastructure Likely Flooded** • Flooding of Canoe Launch Area and Internal Tracks at Everard Park, 1A Maroondah Highway, Healesville	• VICSES to advise organisations that flood warnings have been issued
5.14m	**MODERATE FLOOD LEVEL**		• VICSES to advise organisations that flood warnings have been issued
6.0m	6th February 2011 Flood Level Peak	**Event Summary** •	
6.1m	**MAJOR FLOOD LEVEL**	**Essential Infrastructure Likely Impacted** • Bus Routes 684 and 685 along Maroondah Highway likely impacted at Yarra River Everard Park **Water Over Road** • Maroondah Highway, Healesville at Everard Park	• VICSES to advise organisations that flood warnings have been issued
7.19m	1% AEP (100yr ARI) Flood Level (Major)	• Note: It is not known at what level property and infrastructure contained below starts being flooded **Properties at Flood Risk** **3 Properties in Total** • 534-662 Healesville-Koo Wee Rup Road, Healesville • 1A Maroondah Highway, Healesville	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 103 Donovans Road, Healesville **Essential Infrastructure Likely Impacted** • Sewer Pumping Station at the Yarra Valley Water Healesville Purification Plant	

Table C1.12 – Breakdown of likely consequences at various Coldstream gauge level heights along the Yarra River with operational considerations

APPENDIX C2 – UPPER YARRA RIVER (COLDSTREAM TO CHIRNSIDE PARK) FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along the Yarra River from Coldstream to Chirnside Park					
Property					
Properties	**25**				
Residential	4				
Commercial	7				
Industrial	0				
Public Land	1				
Rural	13				
Community Infrastructure					
Essential Infrastructure					
Major Roads	2	Healesville-Yarra Glen Road and Melba Highway			
Bus Routes	3	578, 685 and 965 along Melba Hwy and Healesville-Yarra Glen Rd			
Sewerage Facilities	1	Pumping Station			
Water Facilities	1	Yering Gorge Pumping Stations			
Airports / Airfields	1	Lilydale Airport			
Tourism / Recreation					
Sports Facilities	4	Melbourne Gun Club, The Heritage Golf & Country Club, Yarra Glen Racecourse and Yering Meadows Golf Course			
Recreation Facilities	4	Spadoni's Nature Reserve, Yarra Glen Recreation Reserve, Yarra Flats Billabongs, Yarra Valley Tourist Railway			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Manningham and Nillumbik	CFA District	1	District 13
SES Unit Area	2	Healesville and Lilydale	FRV District	0	

Table C2.1 – Consequence Summary of 1% AEP flood along the Yarra River from Coldstream to Yering

Downstream of the confluence of the Watts River, the Yarra then turns west, meandering through Coldstream, Yarra Glen & Yering in an area known as 'the Yarra flats'. The town of Yarra Glen is where most of the flood impacts are located along this section of the Yarra River including the Melba Highway & Yarra Valley Racing Centre. As the area is largely flat, floodwaters are slow moving and can last for up to 2-3 weeks with multiple flood peaks due to the number of tributaries flowing into the river upstream. Locally, Watts River, Pauls Creek & Steels Creek join the Yarra River between Healesville & Yarra Glen and have the potential to influence flood levels and impacts. For more insight into flooding impacts, see mapping in **Appendix F**.

Gauges and Warnings

Warnings are available for flooding expected along the Yarra River at Yarra Glen. For other hydrographic/telemetry (river gauges) within the Municipality, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Dixons Creek at Yarra Glen	229290A	South bank of the creek, east side of the Melba Hwy bridge	✓	✓		Melway 267 G8
Olinda Creek at Yering	229258A	West bank of the creek, south side of MacIntyre Lane bridge	✓			Melway 280 H1
Pauls Creek at Tarrawarra	229245A	East bank of the creek, south side of the Healesville – Yarra Glen Road bridge	✓			Melway 268 B12
Steels Creek at Yarra Glen	229246B	East side of the creek, south side of the Melba Hwy bridge	✓			Melway 267 F10
Stringybark Creek at Yering	229247B	East bank of the creek, south side of St Huberts Rd	✓	✓		Melway 275 F11
Watts River at Healesville	229144A	South bank of the river, east side of Healesville – Kinglake Road bridge	✓			Melway 269 J12
Yarra River at Christmas Hills	229270A	300m south of Melb Water Yarra Gorge Pumping Stations, Skyline Rd	✓	✓		Melway 273 H12
Yarra River at Coldstream	229653A	South bank of the river at 771 Maroondah Hwy	✓	✓		Melway 277 D4
Yarra River at Yarra Glen	229206A	West bank of the river at River View Cottages B&B	✓			Melway 275 A2

Table C2.2 – Gauges within the Yarra River catchment from Coldstream to Yering

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

There is currently one flood warning gauge on The Yarra River that could be used for flood warning to assist with public safety through the issue of flood warnings from Coldstream to Warrandyte. This is at Yarra Glen.

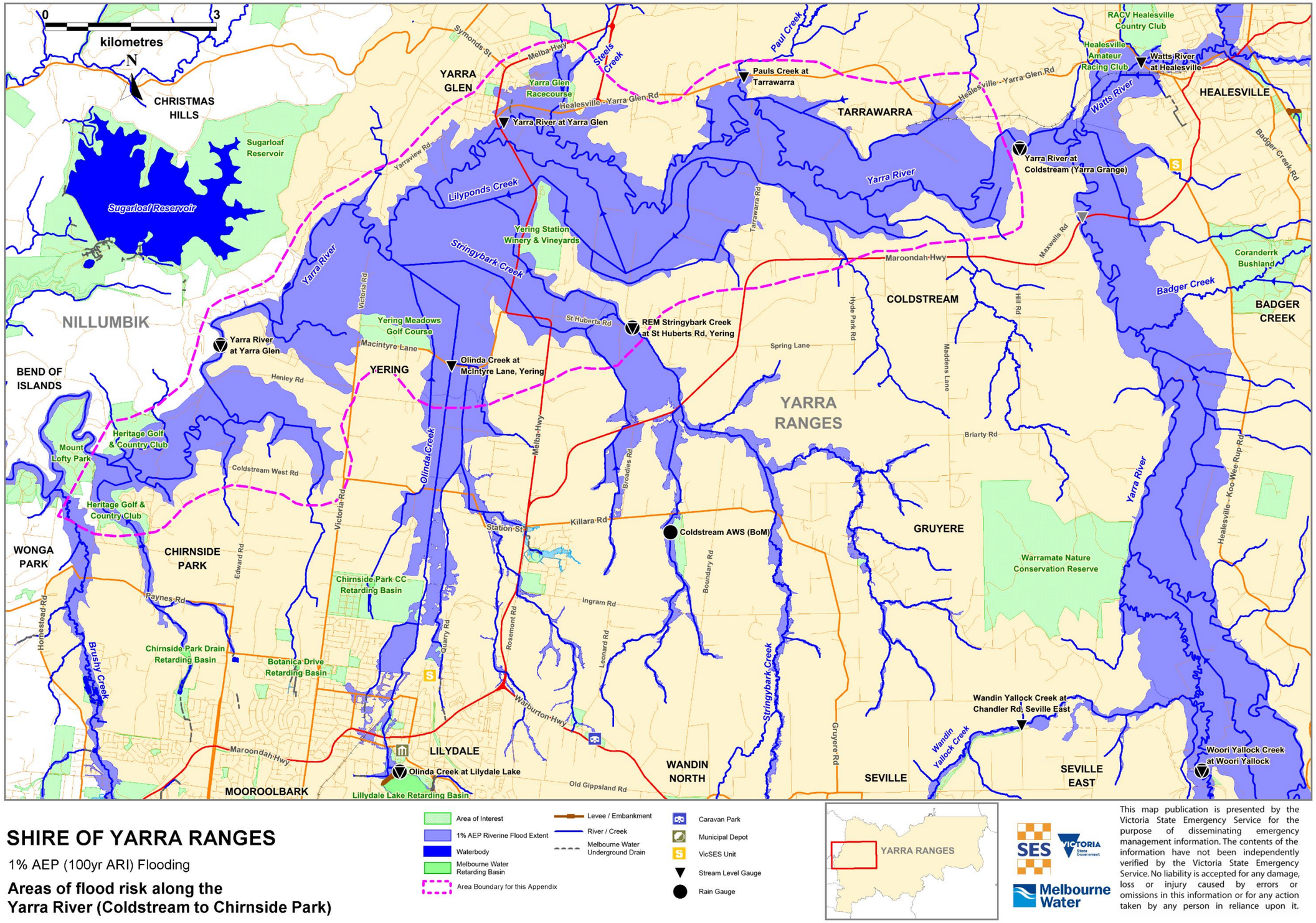
Gauge	Flood Class Level		
	Minor	Moderate	Major
Yarra River at Yarra Glen	4.1m	4.6m	5.0m

Table C2.3 – Hydrographic Monitoring Stations with established Flood Class Levels for the Shire of Yarra Ranges

At these sites on Watts River and the Yarra River, the Bureau of Meteorology (the Bureau) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website(**http://www.bom.gov.au/vic/warnings/index.shtml**). While Yarra Ranges Council monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

The Bureau does not issue formal flood warnings for other creeks and rivers in the Yarra Catchment Coldstream to Yering, generally due to their rapid response to rainfall, giving limited time for a flood warning.

Area Map of Flood Risk along the Yarra River from Coldstream to Chirnside Park



SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

Areas of flood risk along the Yarra River (Coldstream to Chirnside Park)

Figure C2 – Areas of flood risk along the Yarra River in Coldstream, Yarra Glen, Yering and Chirnside Park in the Shire of Yarra Ranges

Properties at Flood Risk

Properties listed in the table below are at risk from flooding. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Yarra River flood mapping (Melbourne Water and S.P. Goh & Associates, November 2010) flood mapping and risk assessment program.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding during a 1% AEP event along the Yarra River between Coldstream and Chirnside Park				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	**Street**	**Suburb**	**Along Melbourne Water Watercourse**	**Flood Risk Type**
1-3	Tarrawarra Road	Coldstream	Yarra River	Riverine
9-11	Tarrawarra Road	Coldstream	Yarra River	Riverine
15-17	Tarrawarra Road	Coldstream	Yarra River	Riverine
23-25	Tarrawarra Road	Coldstream	Yarra River	Riverine
707	Healesville-Koo Wee Rup Road	Tarrawarra	Yarra River	Riverine
739	Healesville-Koo Wee Rup Road	Tarrawarra	Yarra River	Riverine
767	Healesville-Koo Wee Rup Road	Tarrawarra	Yarra River	Riverine
1159	Healesville-Koo Wee Rup Road	Yarra Glen	Yarra River	Riverine
2	Armstrong Grove	Yarra Glen	Yarra River	Riverine
1030	Melba Highway	Yarra Glen	Yarra River	Riverine
2	Bell Street	Yarra Glen	Yarra River	Riverine
4	Bell Street	Yarra Glen	Yarra River	Riverine
6	Bell Street	Yarra Glen	Yarra River	Riverine
8	Bell Street	Yarra Glen	Yarra River	Riverine
2/10	Bell Street	Yarra Glen	Yarra River	Riverine
1/12	Bell Street	Yarra Glen	Yarra River	Riverine
14	Bell Street	Yarra Glen	Yarra River	Riverine
42	Bell Street	Yarra Glen	Yarra River	Riverine
44	Bell Street	Yarra Glen	Yarra River	Riverine
46	Bell Street	Yarra Glen	Yarra River	Riverine
11	MacIntyre Lane	Yering	Yarra River	Riverine
13	MacIntyre Lane	Yering	Yarra River	Riverine
178-180	Victoria Road	Yering	Yarra River	Riverine
192	Victoria Road	Yering	Yarra River	Riverine
194	Victoria Road	Yering	Yarra River	Riverine
Total				
25				

Table C2.4 – Properties at risk of flooding along the Yarra River from Coldstream to Chirnside Park in the Shire of Yarra Ranges

Isolation

No major isolation risks exist for areas around Coldstream, Yarra Glen, Yering or Chirnside Park during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services http://ptv.vic.gov.au/live-travel-updates/ . A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Parts of **Lilydale Airport** on MacIntyre Lane, Yering are at risk from flooding during a major flood at Yarra Glen.

The **Yering Gorge Water Supply Pumping Stations**, located on Skyline Road (Nillumbik) in Christmas Hills will likely be impacted during a 1% AEP flood event.

Apart from the roads outlined below, all other essential infrastructure and services around Coldstream, Yarra Glen, Yering and Chirnside Park are expected to remain predominantly dry during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding along the Yarra River in Coldstream, Yarra Glen & Yering. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely impacted in a 1% AEP (100yr ARI) event
• Melba Highway, Yering near Chateau Yering
• Healesville-Yarra Glen Road, Yarra Glen between Bell Street & Yarra Valley Racecourse
• Healesville-Yarra Glen Road, Yarra Glen between Melba Hwy & Yarra Glen Bypass

Table C2.5 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads likely flooded in a 1% AEP (100yr ARI) event		
COLDSTREAM	**YARRA GLEN**	**YERING**
• Tarrawarra Road	• Armstrong Grove	• McMeikans Road
• Coldstream West Road	• Bell Street	• St Huberts Road
	• Yarraview Road	• MacIntyre Lane
		• Victoria Road

Table C2.6 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

No formal Retarding Basins, Pumping Stations, Levees or Weirs exist along the Yarra River in Coldstream, Yarra Glen, Yering and Chirnside Park.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located along the Yarra River between Coldstream and Chirnside Park is contained within the following table.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
King Street	Yarra River	North	Yarra Valley Water	King Street, Yarra Glen	274 K2

Table C2.7 – Sewer Pumping Stations along the Yarra River between Coldstream and Chirnside Park in the Shire of Yarra Ranges

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Yarra River at various river heights between Coldstream and Chirnside Park. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Yarra River at Yarra Glen
- Yarra River at Christmas Hills

FLOOD INTELLIGENCE CARD – YARRA GLEN GAUGE, YARRA RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**West bank of the river at River View Cottages B&B, Yarra Glen**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229206A**
STREAM:	**Yarra River**
GAUGE NUMBER:	**229206A**
GAUGE ZERO:	**62.32m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**275 A2**
MINOR:	**4.1m**
MODERATE:	**4.57m**
MAJOR	**5.0m**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**4.77m (7th February 2011)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.1m	**MINOR FLOOD LEVEL**	**Community Infrastructure Likely Flooded** • Water over some parts of BBQ area entrance to the Yarra Glen Recreation Reserve and into toilet block at Sports Oval, 1159 Healesville-Koo Wee Rup Road, Yarra Glen • Sections of Yarra Glen Racecourse may start to flood at 2 Armstrong Grove • Yarra Flats Billabongs pedestrian bridge across the billabongs and internal track are flooded, 48 Melba Highway, Yering • Spadoni's Nature Reserve Internal track is inaccessible due to flooding, 194 Victoria Road, Yering	• VICSES to advise organisations that flood warnings have been issued
4.3m	(Minor)	**Water Over Road** • Possible flooding at the lowest point on Melba Highway, Yering near Chateau Yering Historic House Hotel, or near Stringybark Creek	• Deploy signs and close roads as appropriate
4.57m	**MODERATE FLOOD LEVEL**	**Community Infrastructure Likely Flooded** • More sections of Yarra Valley Racecourse become flooded • Most of Yarra Glen Recreation Reserve & Showgrounds flooded • Spadoni's Nature Reserve flooded **Essential Infrastructure Likely Impacted** • Bus Routes 578, 685 and 965 may be restricted along Melba Highway, Yering **Water Over Road** • Melba Highway, Yering between Lilyponds Creek Bridge (near Chateau Yering Historic House Hotel,	• VICSES to advise organisations that flood warnings have been issued

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Yering Station) and Yarra Glen	
4.615m	31st July 1996 Flood Level Peak (Moderate)	**Event Summary** • Melba Hwy at Yering flooded in parts between Macintyre Lane, Yering & Bell Street, Yarra Glen • Yarra Valley Racecourse flooded • Victoria Road, Yering & the Lilydale Gun Club flooded	
4.77m	7th February 2011 Flood Level Peak (Moderate)	**Event Summary** • Melba Hwy at Yarra Glen & Yering closed for more than 24 hours between St Huberts Road, Yering & Bell Street Yarra Glen • Yarra Valley Racecourse flooded	
5.0m	**MAJOR FLOOD LEVEL**	**Essential Infrastructure Likely Impacted** • Bus Routes 685 and 965 may be restricted along Healesville-Yarra Glen Road, Yarra Glen **Water Over Road** • Healesville-Yarra Glen Road, Yarra Glen between Bell Street & Yarra Valley Racecourse • Armstrong Grove, Yarra Glen adjacent to Yarra Valley Racecourse	• VICSES to advise organisations that flood warnings have been issued
8.4mm	1% AEP (100-year ARI flow) (Major)	**Properties at Flood Risk** **20 Properties in Total** • 1-3, 9-11, 15-17 & 23-25 Tarrawarra Road, Coldstream • 707, 739 & 767 Healesville-Koo Wee Rup Road, Tarrawarra • 1159 Healesville-Koo Wee Rup Road, Yarra Glen • 2 Armstrong Grove, Yarra Glen • 1030 Melba Highway, Yarra Glen • 2, 4, 6, 8, 2/10, 1/12, 14, 42, 44 & 46 Bell Street, Yarra Glen **Community Infrastructure Likely Flooded** • Yarra Valley Tourist Railway flooded in sections between Yarra Glen Railway Station and Healesville Railway Station • Melbourne Gun Club, Victoria Road, Yering • Yering Meadows Golf Course, Victoria Road, Yering **Essential Infrastructure Likely Impacted** • Lilydale Airport on Macintyre Lane, Yering • Bus Routes 685 and 965 may be restricted along Healesville-Yarra Glen Road, Yarra Glen **Water Over Road** • Tarrawarra Road, Coldstream • Healesville-Yarra Glen Road, Yarra Glen between Melba Hwy & Yarra Glen Bypass • Melba Hwy, Yarra Glen with significant levels in parts between Healesville-Yarra Glen Road & St Huberts Road in Yering • Bell Street, Yarra Glen adjacent to McKenzie Reserve • Yarraview Road, Yarra Glen • McMeikans Road, Yering • St Huberts Road, Yering	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Macintyre Lane, Yering • Victoria Road, Yering	

Table C2.8 – Breakdown of likely consequences at various Yarra Glen gauge level heights along the Yarra River with operational considerations

FLOOD INTELLIGENCE CARD – CHRISTMAS HILLS GAUGE, YARRA RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**300m south of Melb Water Yarra Gorge Pumping Stations, Skyline Rd, Yering**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229270A**
STREAM:	**Yarra River**
GAUGE NUMBER:	**229270A**
GAUGE ZERO:	**58.56m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**273 H12**
MINOR:	**N/A**
MODERATE:	**N/A**
MAJOR	**N/A**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**4.17m (1st August 1996)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.3m		**Community Infrastructure Likely Flooded** • Spadoni's Nature Reserve flooded at 194 Victoria Road, Yering **Water Over Road** • Melba Highway, Yarra Glen	
7.84m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level property and infrastructure contained below starts being flooded **Properties at Flood Risk** **5 Properties in Total** • 11 & 13 MacIntyre Lane, Yering • 178-180, 192 & 194 Victoria Road, Yering **Community Infrastructure Likely Flooded** • Melbourne Gun Club at 192 Victoria Road, Yering • Yering Meadows Golf Course at 178-180 Victoria Road, Yering • The Heritage Golf & Country Club at 21 Heritage Avenue, Chirnside Park **Essential Infrastructure Likely Impacted** • Lilydale Airport at 13 Macintyre Lane, Yering • Yering Gorge Water Supply Pumping Stations, Skyline Road (Nillumbik) in Christmas Hills **Water Over Road** • Macintyre Lane, Yering • Victoria Road, Yering	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Coldstream West Road, Coldstream	

Table C2.9 – Breakdown of likely consequences at various Yering gauge level heights along the Yarra River with operational considerations

APPENDIX C3 – LITTLE YARRA RIVER FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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Summary of Consequences in a 1% AEP (100yr ARI) flood along the Little Yarra River					
Property					
Properties	**35**				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	35	Little Yarra Rd, Settlement Rd, Lowes Rd, Doon Rd, Don Rd and Warburton Hwy			
Community Infrastructure					
Essential Infrastructure					
Major Roads	2	Don Road and Warburton Hwy			
Bus Routes	1	683 along Warburton Hwy			
Sewerage Facilities	2	1 Pumping Station and 1 Emergency Relief Point			
Water Facilities	1	Lake Muratore on Saxon Creek, Gilderoy			
Tourism / Recreation					
Recreation Facilities	1	Warburton Trail			
Caravan Parks	1	Doon Reserve Caravan Park			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	1	Upper Yarra	FRV District	0	

Table C3.1 – Consequence Summary of 1% AEP flood along the Little Yarra River

Little Yarra River flows from the southeast through the towns of Powelltown, Gilderoy, Three Bridges, Gladysdale & Yarra Junction where it joins the Yarra River at the local floodplain. The Little Yarra River runs beside Yarra Junction-Noojee Road where it puts at risk a couple of properties from flooding directly and may isolate a number more by cutting local roads. In Yarra Junction where a floodplain resides, there are a number of rural houses as well as the Doon Reserve Caravan Park at risk. This area may become flooded in more frequent flooding events.

In Golderoy, the largest private dam in Greater Melbourne **Lake Muratore** is located to the south via a small Tributary **Saxon Creek**. It is large enough that if the Dam were to fail, flooding impacts downstream through Gilderoy, Three Bridges, Gladysdale & Yarra Junction would be expected.

For more insight into flooding consequences along the Little Yarra River, see mapping in **Appendix F**.

Gauges and Warnings

Whilst there are hydrographic/telemetry stations (river gauges) within the municipality, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Little Yarra River at Yarra Junction	229214A	South bank of the river, west side of Lowes Road	✓			Melway 288 F7
Warburton	586193	50 Old Warburton Road		✓		Melway 290 D7
Yarra River at Yarra Junction	229234A	Doon Reserve Caravan Park at the end of Doon Road	✓			Melway 288 C5

Table C3.2 – Hydrographic Monitoring Stations within the Little Yarra River catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk along the Little Yarra River

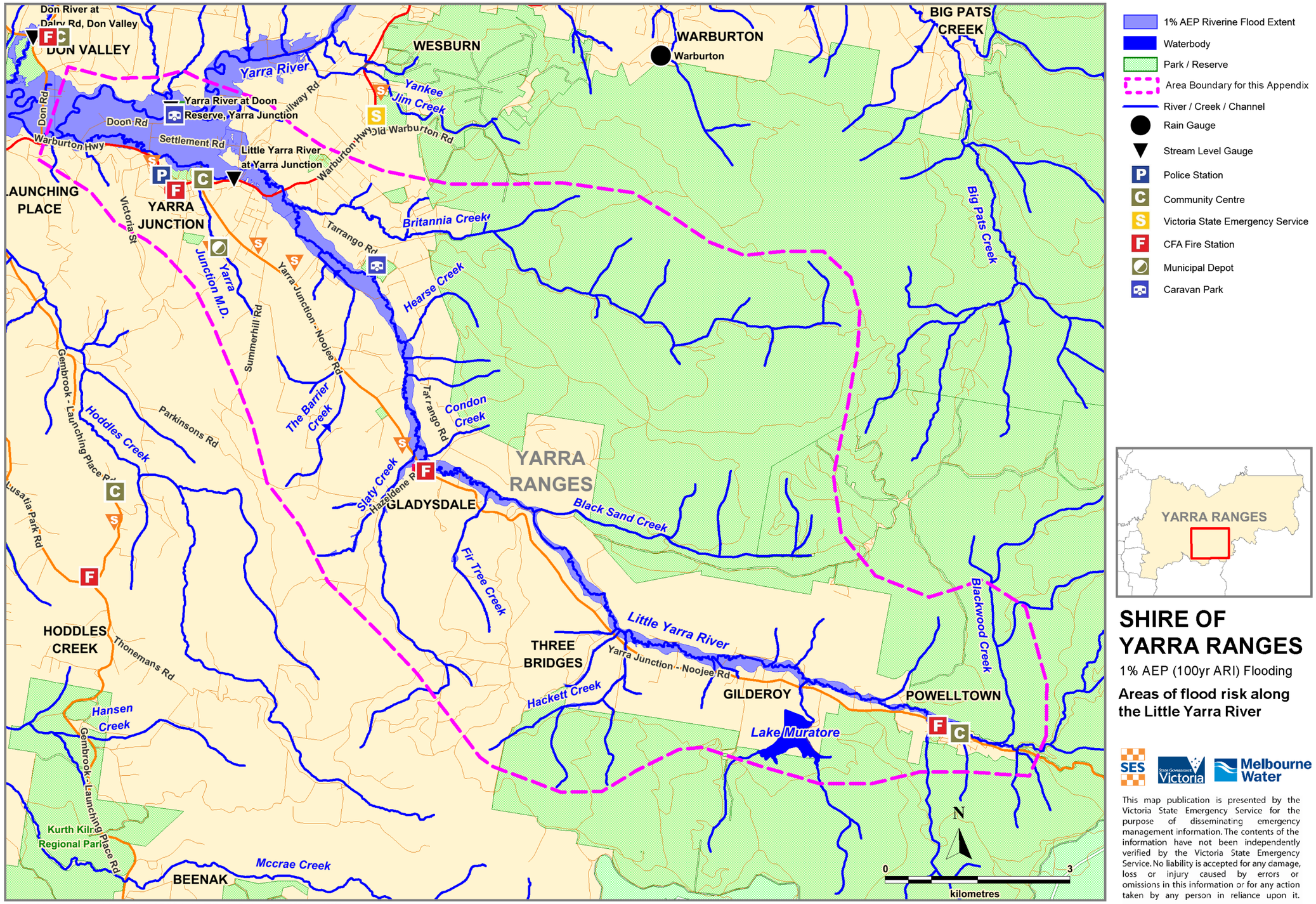

Figure C3 – Areas of flood risk along the Little Yarra River in Powelltown, Gilderoy, Three Bridges, Gladysdale & Yarra Junction in the Shire of Yarra Ranges.

Properties at Flood Risk

Properties listed in the table below are at risk from property flooding. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Little Yarra River flood mapping (Melbourne Water and S.P. Goh & Associates, July 2013) flood mapping and risk assessment program.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding during a 1% AEP event along the Little Yarra River

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
555	Little Yarra Road	Gladysdale	Little Yarra River	Riverine
565	Little Yarra Road	Gladysdale	Little Yarra River	Riverine
595	Little Yarra Road	Gladysdale	Little Yarra River	Riverine
2531	Warburton Highway	Yarra Junction	Little Yarra River	Riverine
2537	Warburton Highway	Yarra Junction	Little Yarra River	Riverine
2545	Warburton Highway	Yarra Junction	Little Yarra River	Riverine
2547	Warburton Highway	Yarra Junction	Little Yarra River	Riverine
2575	Warburton Highway	Yarra Junction	Little Yarra River	Riverine
155	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
185	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
200	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
210	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
215	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
250	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
270	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
280	Settlement Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
65	Lowes Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
115	Lowes Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
125	Lowes Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
30	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
55	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
60	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
90	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
125	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
140	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
150	Doon Road	Launching Place	Little Yarra River & Yarra River	Riverine
200	Doon Road	Yarra Junction	Little Yarra River & Yarra River	Riverine
2205	Warburton Highway	Launching Place	Little Yarra River & Yarra River	Riverine
2005	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine
2025	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine
2035	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine
2045	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine
2055	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine
2065	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine

2085	Don Road	Launching Place	Little Yarra River & Yarra River	Riverine
Total				
35				

Table C3.3 – Properties at risk of flooding along the Little Yarra River catchment in the Shire of Yarra Ranges

Isolation

No major isolation risks exist for areas along the Little Yarra River in Powelltown, Gilderoy, Three Bridges, Gladysdale & Yarra Junction due to flooding solely from Little Yarra River. However, depending on levels of flooding along the Yarra River, Warburton Highway in Launching Place may be cut for up to 72 hours during a major flood event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services http://ptv.vic.gov.au/live-travel-updates/ . A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas along the Little Yarra River in Powelltown, Gilderoy, Three Bridges, Gladysdale & Yarra Junction are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding along the Little Yarra River in Gilderoy, Three Bridges, Gladysdale & Yarra Junction. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely impacted in a 1% AEP (100yr ARI) event
• Don Road, Launching Place
• Warburton Highway, Wesburn at Britannia Creek Road
• Warburton Highway, Yarra Junction at Riversdale Road
• Warburton Highway, Launching Place at Barak Drive

Table C3.4 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads likely flooded in a 1% AEP (100yr ARI) event		
GILDEROY	**THREE BRIDGES**	**YARRA JUNCTION**
• Howells Road	• Blacksands Road	• Corduroy Road
GLADYSDALE	• Coles Road	• Lowes Road
• Tarrango Road	• McConachys Road	• Settlement Road
LAUNCHING PLACE		
• Doon Road		

Table C3.5 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees exist along the Little Yarra River in Powelltown, Gilderoy, Three Bridges, Gladysdale & Yarra Junction.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located along the Little Yarra River is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Yarra Junction	Little Yarra River	South	Yarra Valley Water	Along the Warburton Trail, Yarra Junction	288 C7

Table C3.6 – Sewer Pumping Stations within the Little Yarra River Catchment

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along the Little Yarra River that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Little Yarra River	South	Yarra Valley Water	Along the Warburton Trail, Yarra Junction	288 C7

Table C3.7 – Sewer Emergency Relief Points in the Little Yarra River Catchment

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The table on the following pages provide a breakdown of the possible consequences of flooding along the Little Yarra River at various river heights. This table is to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Little Yarra River at Yarra Junction

FLOOD INTELLIGENCE CARD – YARRA JUNCTION GAUGE, LITTLE YARRA RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

LOCATION:	**South bank of the river, west side of Lowes Road, Yarra Junction**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229214A**
STREAM:	**Little Yarra River**
GAUGE NUMBER:	**229214A**
GAUGE ZERO:	**113.73m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**288 F7**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**1.69m (18th September 1984)**

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
1.24m	20% AEP (5yr ARI) Flood Level	**Properties at Flood Risk** **10 properties in Total** • 565 Little Yarra Road, Gladysdale • 155, 200, 210, 215, 270 & 280 Settlement Road, Yarra Junction • 65 Lowes Road, Yarra Junction • 55 Doon Road, Launching Place • 2085 Don Road, Launching Place **Community Infrastructure Flooded** • Warburton Trail, Yarra Junction south of Railway Road / Settlement Road Intersection **Water Over Road (above 300mm depth)** • Howells Road, Gilderoy • McConachys Road, Three Bridges • Coles Road, Three Bridges • Settlement Road, Yarra Junction • Corduroy Road, Yarra Junction • Doon Road, Launching Place near the Warburton Highway	
1.32m	10% AEP (10yr ARI) Flood Level	**Properties at Flood Risk** **12 properties in Total at this Level; 2 new at this Level**	

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
		• 2531 Warburton Highway, Yarra Junction • 2065 Don Road, Launching Place **Community Infrastructure Flooded** • Doon Reserve Caravan Park on Doon Road, Yarra Junction becomes Isolated **Water Over Road (over 300mm depth)** • Blacksands Road, Three Bridges • Tarrango Road, Gladysdale at the Little Yarra River bridge • Lowes Road, Yarra Junction • Doon Road, Launching Place at Corduroy Road	
1.34m	5% AEP (20yr ARI) Flood Level	**Properties at Flood Risk** **17 Properties in Total at this Level; 5 new at this Level** • 125 & 140 Doon Road, Launching Place • 2035, 2045 & 2055 Don Road, Launching Place **Water Over Road (above 300mm depth)** • Don Road, Launching Place	
1.40m	2% AEP (50yr ARI) Flood Level	**Properties at Flood Risk** **26 Properties in Total at this Level; 9 new at this Level** • 555 Little Yarra Road, Gladysdale • 2537 & 2547 Warburton Highway, Yarra Junction • 125 Lowes Road, Yarra Junction • 90, 150 & 200 Doon Road, Launching Place • 2205 Warburton Highway, Launching Place • 2025 Don Road, Launching Place **Community Infrastructure Flooded** • Doon Reserve Caravan Park on Doon Road, Yarra Junction starts flooding **Essential Infrastructure Likely Impacted** • Bus Route 683 may be restricted along the Warburton Hwy **Water Over Road (above 300mm depth)** • Warburton Highway, Launching Place at Barak Drive	
1.44m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **35 Properties in Total at this Level; 9 new at this Level** • 595 Little Yarra Road, Gladysdale • 2545 & 2575 Warburton Highway, Yarra Junction • 185 & 250 Settlement Road, Yarra Junction • 115 Lowes Road, Yarra Junction • 30 & 60 Doon Road, Launching Place • 2005 Don Road, Launching Place	

Table C3.8 – Breakdown of likely consequences at various Yarra Junction gauge level heights along the Little Yarra River with operational considerations

APPENDIX C4 – WATTS RIVER & GRACE BURN CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along the Watts River and Grace Burn Creek					
Property					
Properties	**55**				
Residential	23				
Commercial	5	Maroondah Highway			
Industrial	9	Hunter Road and Railway Parade			
Public Land	3				
Rural	15				
Community Infrastructure					
Retirement Villages	1	Entrance to Maroondah Retirement Village on Don Road			
Child Care / Kindergartens	1	Queens Park Kindergarten			
Community Venues	3	Healesville RSL, Healesville Walk Shopping Centre and River Street Community Market			
Essential Infrastructure					
Major Roads	3	Don Road, Maroondah Highway and Healesville-Kinglake Road			
Bus Routes	5	684, 685, 686, 687 and 965			
Sewerage Facilities	1	Emergency Relief Point			
Water Facilities	1	Maroondah Reservoir			
Drainage Facilities	1	Mount Riddle Rd Retarding Basin			
Tourism / Recreation					
Sports Facilities	2	Healesville Amateur Racing Club and Healesville Bowling Club			
Recreation Facilities	3	Coronation Park, Queens Park and Healesville Tourist Railway Line			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	1	Healesville	FRV District	0	

Table C4.1 – Consequence Summary of 1% AEP flood along the Watts River and Grace Burn Creek

Watts River flows from the east before entering the **Maroondah Reservoir** approximately 5km east of the town of Healesville. The river continues flowing west, taking a dog-leg turn to the left and flowing alongside the towns centre where the river then joins the Yarra River in Coldstream. A number of tributaries flow into Watts River in Healesville including Grace Burn Creek, Donnellys Creek, New Chum Creek & Myers Creek which all have the potential to influence flood levels and impacts in Healesville. For more insight into flood impacts in Healesville, see mapping in **Appendix F**.

Gauges and Warnings

Warnings are available for flooding expected along Watts River at Healesville. Flood class levels for the Healesville gauge is detailed in table 4.3 and is used in the issuing of a flood warning for the Watts River at Healesville. Other level / flood gauges within the Watts River catchment are also contained within table C4.2.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Donnellys Creek d/s Diversion Weir	229277A	East bank of the creek 400m south of Picnic area	✓			Melway 270 G7
Grace Burn d/s Graceburn Weir	229133B	South bank of the creek at the Graceburn Weir	✓	✓		VicMap 6536 E4
Maroondah Reservoir Level	229130A	70m north of the Melb. Water Healesville Work Centre	✓	✓		Melway 270 J4
Watts River at Healesville	229144A	South bank of the river, east side of Healesville – Kinglake Road bridge	✓			Melway 269 J12
Watts River at River Street		Coronation Park, River Street, Healesville	Staff Gauge Only			Melway 270 C12

Table C4.2 – Gauges within the Watts River catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

There are currently 4 Melbourne Water Gauging Stations on Watts River & The Yarra River that could be used for flood warning to assist with public safety. These are at Healesville, Coldstream, Millgrove & Yarra Glen. Those gauges with flood class levels established are outlined in the table below.

Gauge	Flood Class Level		
	Minor	Moderate	Major
Watts River at Healesville	2.6m	3.1m	4.0m

Table C4.3 – Gauges with established Flood Class Levels for the Watts River

At these sites on Watts River and the Yarra River, the Bureau of Meteorology (the Bureau) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website(**http://www.bom.gov.au/vic/warnings/index.shtml**). While Yarra Ranges Council monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

The Bureau does not issue formal flood warnings for other creeks and rivers in the Watts River Catchment, generally due to their rapid response to rainfall, giving limited time for a flood warning.

Area Map of Flood Risk around the Watts River and Grace Burn Creek in Healesville

Flood Modelling completed by Melbourne Water & S P Goh, July 2013. Map Produced by VicSES August 2020.

Figure C4 – Areas of flood risk along Watts River and Grace Burn Creek around Healesville in the Shire of Yarra Ranges

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Watts River and Grace Burn Creek in Healesville. As more intelligence becomes available, this list may change.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding during a 1% AEP event along Watts River and Grace Burn Creek

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
50	Maroondah Parade	Healesville	Watts River	Riverine
65	Maroondah Parade	Healesville	Watts River	Riverine
5	Camerons Road	Healesville	Watts River	Riverine
45	Camerons Road	Healesville	Watts River	Riverine
5	Donnellys Weir Road	Healesville	Watts River	Riverine
15	Donnellys Weir Road	Healesville	Watts River	Riverine
20	Donnellys Weir Road	Healesville	Watts River	Riverine
35	Donnellys Weir Road	Healesville	Watts River	Riverine
50	Donnellys Weir Road	Healesville	Watts River	Riverine
65	Donnellys Weir Road	Healesville	Watts River	Riverine
70	Donnellys Weir Road	Healesville	Watts River	Riverine
95	St Leonards Road	Healesville	Watts River	Riverine
15	Walkers Lane	Healesville	Watts River	Riverine
17	Walkers Lane	Healesville	Watts River	Riverine
3	Rutter Avenue	Healesville	Grace Burn Creek	Riverine
5	Rutter Avenue	Healesville	Grace Burn Creek	Riverine
5A	Rutter Avenue	Healesville	Grace Burn Creek	Riverine
7	Rutter Avenue	Healesville	Grace Burn Creek	Riverine
21	Rutter Avenue	Healesville	Watts River	Riverine
19-21	Farnham Road	Healesville	Grace Burn Creek	Riverine
1	Don Road	Healesville	Grace Burn Creek	Riverine
3	Don Road	Healesville	Grace Burn Creek	Riverine
5	Don Road	Healesville	Grace Burn Creek	Riverine
9	Don Road	Healesville	Grace Burn Creek	Riverine
11	Don Road	Healesville	Grace Burn Creek	Riverine
13	Don Road	Healesville	Grace Burn Creek	Riverine
30	Don Road	Healesville	Grace Burn Creek	Riverine
32	Don Road	Healesville	Grace Burn Creek	Riverine
34	Don Road	Healesville	Grace Burn Creek	Riverine
36	Don Road	Healesville	Grace Burn Creek	Riverine
36C	Don Road	Healesville	Grace Burn Creek	Riverine
251-263	Maroondah Highway	Healesville	Watts River	Riverine
265-269	Maroondah Highway	Healesville	Watts River	Riverine
316	Maroondah Highway	Healesville	Grace Burn Creek	Riverine
334	Maroondah Highway	Healesville	Grace Burn Creek	Riverine
336-364	Maroondah Highway	Healesville	Grace Burn Creek	Riverine

Properties at risk from Flooding during a 1% AEP event along Watts River and Grace Burn Creek				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
18	Green Street	Healesville	Watts River	Riverine
35	River Street	Healesville	Watts River	Riverine
55	River Street	Healesville	Watts River	Riverine
57	River Street	Healesville	Watts River	Riverine
59	River Street	Healesville	Watts River	Riverine
61	River Street	Healesville	Watts River	Riverine
85	River Street	Healesville	Watts River	Riverine
95-115	River Street	Healesville	Watts River	Riverine
5-9	Railway Parade	Healesville	Watts River	Riverine
11	Railway Parade	Healesville	Watts River	Riverine
17	Hunter Road	Healesville	Watts River	Riverine
19	Hunter Road	Healesville	Watts River	Riverine
23	Hunter Road	Healesville	Watts River	Riverine
27	Hunter Road	Healesville	Watts River	Riverine
1/29	Hunter Road	Healesville	Watts River	Riverine
2/29	Hunter Road	Healesville	Watts River	Riverine
3/29	Hunter Road	Healesville	Watts River	Riverine
109	Healesville-Kinglake Road	Healesville	Watts River	Riverine
103	Donovans Road	Healesville	Watts River	Riverine

Total
55

Table C4.4 – Properties at risk of flooding along Watts River & Grace Burn Creek in the Yarra Ranges

Isolation

No major isolation risks exist for Healesville. However, access may be cut to eastern Healesville from the west where the Healesville District Hospital is located for a period while Maroondah Highway and Don Road are cut by Grace Burn Creek and St Leonards Road to the north is cut by Watts River. Access to the east via Maroondah Highway is expected to remain open. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services http://ptv.vic.gov.au/live-travel-updates/ . A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services around Healesville are expected to remain predominantly dry during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Healesville. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely impacted in a 1% AEP (100yr ARI) event
• Don Road, Healesville between Maroondah Highway and Queens Park
• Don Road, Healesville at Donald Street
• Maroondah Highway, Healesville between Badger Creek Road & Don Road
• Healesville-Kinglake Road, Healesville between Healesville-Yarra Glen Road & Hunter Road

Table C4.5 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads flooded in a 1% AEP (100yr ARI) event			
HEALESVILLE	• Glenfern Road	• Railway Parade	• Walkers Lane
• Bradshaw Drive	• Juel Crescent	• River Street	• Wallace Parade
• Camerons Road	• Maroondah Parade	• Rutter Avenue	• Weiss Road
• Donnellys Weir Road	• Myers Creek Road	• St Leonards Road	• Wilson Street

Table C4.6 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses in Flow Path (sunny day)	Melway Reference
Mount Riddell Rd, Healesville	Don Road Drain	105.5m AHD	105.5m AHD	Unavailable	3.0m 106.0m AHD	38.3ML	Low	1	278 F3

Table C4.7 – Melbourne Water Retarding Basins within the Watts River and Grace Burn Creek catchments in the Yarra Ranges

No formal Pumping Stations, Levees or Weirs exist around Healesville and Badger Creek.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Healesville is contained within the following table.

Sewer Emergency Relief Points

There is a Sewer Emergency Relief Point near the lower Watts River that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Railway Parade Main Drain	South side of Watts River	Yarra Valley Water	Railway Parade, Healesville	277 K1

Table C4.8 – Sewer Emergency Relief Points in the Watts River Catchment

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Watts River and Grace Burn Creek at various river or creek heights around Healesville. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Watts River at Maroondah Reservoir
- Watts River at Healesville

FLOOD INTELLIGENCE CARD – MAROONDAH RESERVOIR GAUGE, WATTS RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**70m north of the Melb. Water Healesville Work Centre, Maroondah Reservoir**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229130A**
STREAM:	**Watts River**
GAUGE NUMBER:	**229130A**
GAUGE ZERO:	**123.25m AHD**
GAUGE TYPE:	**Reservoir Level & Rain**

MELWAY REFERENCE:	**270 K5**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
SPILLWAY LEVEL:	**16.243m**
HIGHEST RECORDED FLOOD:	**18.18m (1st December 1934)**

Reservoir Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
16.243m		• Full Supply Level. Water starts to flow over the spillway.	
16.65m		• Water Level at Healesville is expected to exceed 3.0m	
16.85m	10th February 1996 Reservoir Level		

Reservoir Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
18.12m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **12 Properties in Total** • 50 & 65 Maroondah Parade, Healesville • 5 & 45 Camerons Road, Healesville • 5, 15, 20, 35, 50, 65 & 70 Donnellys Weir Road, Healesville • 95 St Leonards Road, Healesville **Community Infrastructure Flooded** • Parts of the Maroondah Reservoir Park around the Hendersons Picnic Area **Water Over Road** • Camerons Road, Healesville • Donnellys Weir Road, Healesville • Maroondah Parade, Healesville • St Leondards Road, Healesville • Myers Creek Road, Healesville • Bradshaw Drive, Healesville	
18.18m	1st December 1934 Flood Level Peak		

Table C4.9 – Breakdown of likely consequences at various Maroondah Reservoir gauge level heights on the Watts River with operational considerations

FLOOD INTELLIGENCE CARD – HEALESVILLE GAUGE, WATTS RIVER

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**South bank of the river, east side of Healesville – Kinglake Road bridge**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229144A**
STREAM:	**Watts River**
GAUGE NUMBER:	**229144A**
GAUGE ZERO:	**74.20m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**269K12**
MINOR:	**2.6m**
MODERATE:	**3.1m**
MAJOR	**4.0m**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**3.51m (30th July 1996)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
2.6m	**MINOR FLOOD LEVEL**		
2.7m		**Water Over Road** • River Street at Church Street, Healesville (Melway 270 B12) flooded at lowest point	
2.85m		**Properties at Flood Risk** **2 Property in Total** • Strawberry Farm at 35 River Street (Melway 270 A12) opposite Healesville Railway Station • Coronation Park at 95-115 River Street, Healesville **Community Infrastructure Flooded** • Picnic Area (Melway 270 C12) at 95-115 Coronation Park, behind Healesville Walk Shopping Centre starts flooding • Car park in Coronation Park (Melway 270 C12), Healesville is flooded **Water Over Road** • River Street, Healesville (Melway 270 B12)	
2.86m	February 2011 Flood Level Peak	**Event Summary** • Don Road, Healesville near Maroondah Highway flooded	
3.1m	**MODERATE FLOOD LEVEL**	**Properties at Flood Risk** **3 New at Level; 5 Properties in Total**	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
		• 85 River Street, Healesville by 83pprox.. 0.5m of water • 36 Don Road, Healesville • 36C Don Road, Healesville **Community Infrastructure Flooded** • Healesville Bowling Club flooded (Melway 270B12) • Queens Park at 36C Don Road, Healesville **Essential Infrastructure Impacted** • Bus Routes 684, 685, 686, 687 & 965 (Night Bus) likely impacted along Maroondah Highway and Routes 686, 685 & 965 along Don Road, Healesville **Water Over Road** • Don Road, Healesville between Maroondah Highway and Queens Park • Maroondah Highway, Healesville between Badger Creek Road & Don Road • River Street, Healesville (Melway 270B12) is approximately 0.40m under water	
3.39m	February 1996 Flood Level Peak	**Event Summary** • Healesville Caravan Park on River Street, Healesville (now relocated to Don Road, Badger Creek) was severely flooded. Parkland now exists in place. • Relief Centre established for Caravan Park residents • Park Drive Motel on Maroondah Highway, Healesville flooded (now replaced with shops adjacent to Innocent Bystander Winery) • 4 properties on Donnellys Weir Road required sandbagging	
3.49m	October 2010 Flood Level Peak	**Event Summary** • Properties on Walkers Lane, Healesville flooded • Property on Robin Parade, Healesville flooded • Donnellys Weir Road, Healesville flooded • Healesville Amateur Racing Club flooded • Healesville Bowling Club flooded • No residents evacuated	
3.51m	July 1996 Flood Level Peak	**Event Summary** • At least 40 residents evacuated • Properties Sandbagged along Grace Burn Creek on Don Road, Healesville • Healesville Caravan Park on River Street, Healesville (now relocated to Don Road, Badger Creek) was severely flooded. Parkland now exists in place. • Properties on St Leonards Road, Healesville flooded	
3.7m	September 1984 Flood Level Peak (estimate level only)	**Event Summary** • Unavailable	
4.0m	**MAJOR FLOOD LEVEL**	• Extensive area flooding expected with properties likely flooded	
5.2m	1% AEP (100-year ARI flow) (Major)	• Note: It is not known at what level property and infrastructure contained below starts being flooded **Properties at Flood Risk** **50 New at Level; 55 Properties in Total**	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
		• 50 & 65 Maroondah Parade, Healesville • 5 & 45 Camerons Road, Healesville • 5, 15, 20, 35, 50, 65 & 70 Donnellys Weir Road, Healesville • 95 St Leonards Road, Healesville • 15 & 17 Walkers Lane, Healesville • 3, 5, 5A, 7 & 21 Rutter Avenue, Healesville • 19-21 Farnham Road, Healesville • 1, 3, 5, 9, 11, 13, 30, 32 & 34 Don Road, Healesville • 251-263, 265-269, 316, 334 & 336-364 Maroondah Highway, Healesville • 18 Green Street, Healesville • 55, 57, 59 & 61 River Street • 5-9 & 11 Railway Parade • 17, 19, 23, 27 & Factories 1-3/29 Hunter Road, Healesville • 109 Healesville-Kinglake Road, Healesville • 103 Donovans Road, Healesville **Community Infrastructure Flooded** • Tennis Courts, Netball Court, Skate Park and BBQ areas in Queens Park flooded • Queens Park Kindergarten • Entrance to Maroondah Retirement Village via Don Road cut • Healesville RSL Car Park • Healesville Walk Shopping Centre on Maroondah Highway, Healesville • Car Park on River Street holding Community Market (1st Sunday Each Month) • Healesville Amateur Racing Club at 109 Healesville-Kinglake Road • Healesville Tourist Railway Line west of Healesville-Kinglake Road, Healesville **Essential Infrastructure Likely Impacted** • Sewer Emergency Relief Point located on Railway Parade, Healesville **Water Over Road** • Donnellys Weir Road, Healesville • St Leonards Road, Healesville • Myers Creek Road, Healesville • Bradshaw Drive, Healesville • Weiss Road, Healesville • Walkers Lane, Healesville • Wilson Street, Healesville • Rutter Avenue, Healesville • Wallace Parade, Healesville • Glenfern Road, Healesville • Juel Crescent, Healesville • Healesville-Kinglake Road, Healesville between Healesville-Yarra Glen Road & Hunter Road • Railway Parade, Healesville	

Table C4.8 – Breakdown of likely consequences at various Healesville gauge level heights along Watts River and Grace Burn Creek with operational considerations

APPENDIX C5 – OLINDA & STRINGYBARK CREEKS FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Olinda Creek					
Property					
Properties	**90**				
Residential	46				
Commercial	25	William Street East and Main Street, Lilydale			
Industrial	10	Beresford Road and Hightech Place			
Public Land	5				
Rural	4	York Road, Mount Evelyn and MacIntyre Lane and Victoria Road, Yering			
Community Infrastructure					
Schools / Colleges	1	Mt Lilydale Mercy College Sports Grounds			
Child Care / Kindergartens	1	Goodstart Early Learning Montrose			
Community Venues	1	York on Lilydale			
Essential Infrastructure					
Major Roads	3	Maroondah Highway, Swansea Road and York Road			
Major Rail	1	Lilydale Station Carpark			
Bus Routes	5	Routes 663, 677, 679, 680 and 964 and Terminal Station at Lilydale Railway Station			
Sewerage Facilities	5	4 Pumping Stations and 1 Emergency Relief Point			
Drainage Facilities	1	Lilydale Lake			
Airports / Airfields	1	Lilydale Airport			
Tourism / Recreation					
Sports Facilities	2	Melbourne Gun Club and Yering Meadows Golf Course			
Recreation Facilities	6	Keith Hume Fraser Reserve, Lilydale Lake Picnic Area, Melba Park, Nelson Road Walking Trail, Olinda Creek Trail and Spadoni Nature Reserve			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	2	Lilydale and Healesville	FRV District	0	

Table C5.1 – Consequence Summary of 1% AEP flood along Olinda Creek

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Stringybark Creek					
Property					
Properties	**68**				
Residential	55				
Commercial	5	Maroondah Highway, Coldstream			
Industrial	0				
Public Land	0				
Rural	8				
Community Infrastructure					
Essential Infrastructure					
Major Roads	1	Clegg Road			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	2	Lilydale and Healesville	FRV District	0	

Table C5.2 – Consequence Summary of 1% AEP flood along Stringybark Creek

The Olinda and Stringybark Creeks begin on the slopes of Mount Dandenong in Olinda and Silvan respectively working their way north through Mount Evelyn where the first risks to infrastructure are presented. Olinda Creek crosses main roads such as York Road and Swansea Road which have the potential to be cut during an intense rainfall event. Both catchments are relatively small and the creeks respond quickly to rain.

Olinda creek runs northward adjacent to Swansea Road where in feeds into the Lilydale Lake in Lilydale. Lilydale Lake is a large retarding basin containing a river level gauge monitoring the lake level. From Lilydale Lake, Olinda creek continues northward where it enters the Lilydale town centre and a number of urban infrastructure risks. Such risks include shops and light industrial areas around Maroondah Highway and around Beresford Road.

From the Lilydale Town-centre, the Olinda Creek continues northward through Coldstream where it enters predominantly flat terrain and a relatively undeveloped landscape for 8km where it joins the Yarra River at Yering.

Stringybark creek after crossing Clegg Road in Mount Evelyn flows north through Wandin North then Coldstream and Gruyere where it joins the Olinda Creek in Yering. Killara Road, St Huberts Road & the Melba Highway are roads that may be cut by flooding from Stringybark Creek. The Coldstream Airport also lays adjacent to the western tributary of Stringybark Creek on Killara Road.

Gauges and Warnings

Whilst there are gauges within the Olinda and Stringybark Creeks catchments, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Olinda Creek at Lilydale Lake	229672A	Lilydale Lake Dam Wall, north-eastern edge at outlet, Swansea Road, Lilydale	✓	✓		Melway 38 F6
Olinda Creek at Mount Evelyn	229690A	South bank of the creek, East side of York Road bridge at Tramway Rd	✓	✓		Melway 120 A3
Olinda Creek at Yering	229258A	West bank of the creek, south side of MacIntyre Lane bridge	✓			Melway 280 H1
Stringybark Creek at Mount Evelyn	229401A	West bank of the creek at cnr Clegg Road and Forest Rd	✓			Melway 118 H12
Stringybark Creek at Yering	229247B	East bank of the creek, south side of St Huberts Rd	✓	✓		Melway 275 F11
Stringybark Creek at Melba Hwy, Yering	229247A	Melba Highway, Yering	Staff Gauge Only			Melway 275 B11

Table C5.3 – Gauges within the Olinda Creek and Stringybark Creek catchments

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk around the Olinda and Stringybark Creeks

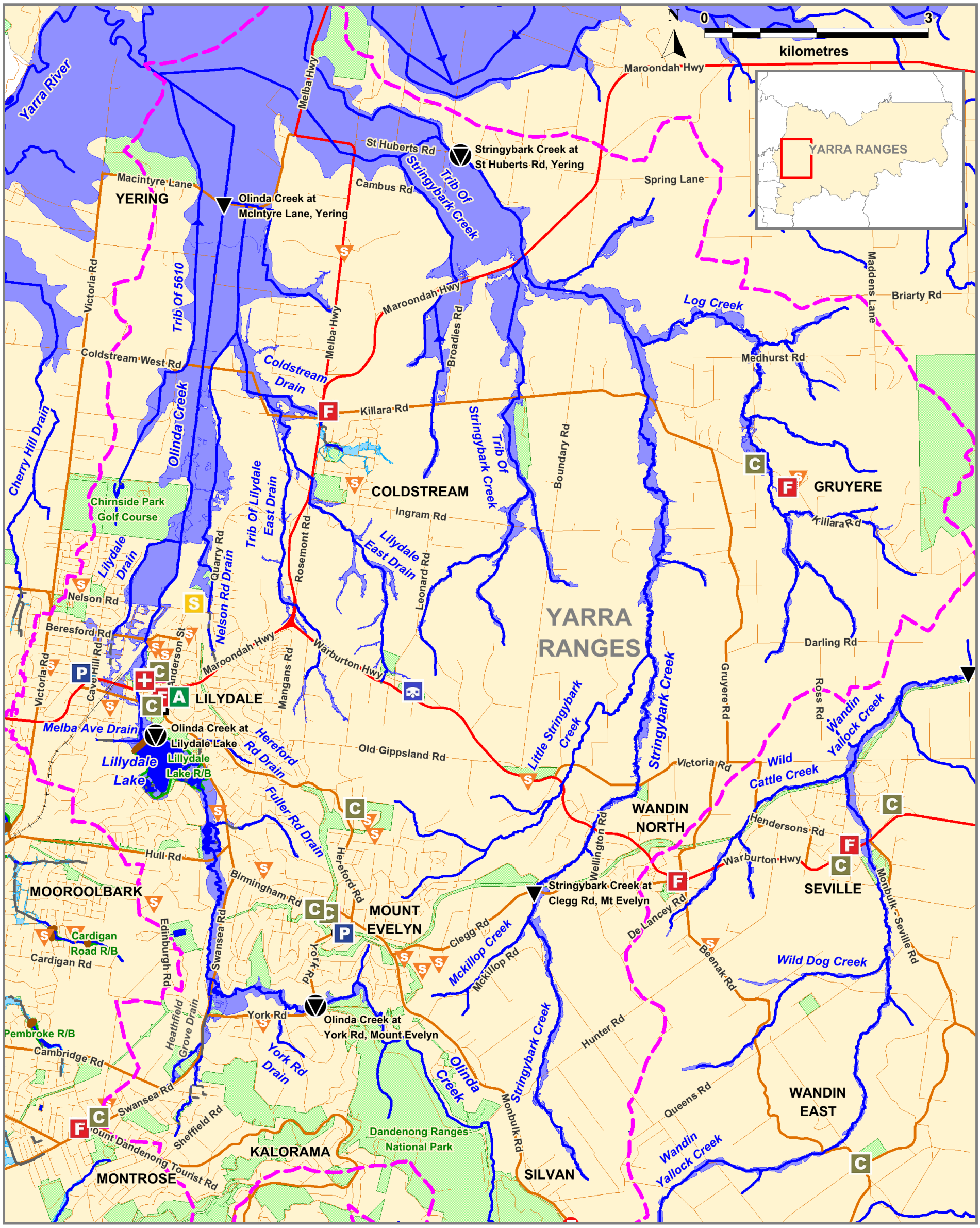

Figure C5 – Areas of flood risk along Olinda & Stringybark Creeks in Mount Evelyn, Lilydale, Wandin North, Coldstream, Gruyere & Yering.

Properties at Flood Risk

Properties listed in the table below are at risk from flooding within the Olinda Creek catchment. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Olinda Creek Flood Mapping (S.P. Goh & Associates, February 2017) flood mapping and risk assessment program.

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Properties at risk from Flooding along the Olinda Creek Catchment

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
5% AEP	2% AEP	1% AEP				
-	-	132-134	York Road	Mount Evelyn	Olinda Creek	Riverine
-	-	136	York Road	Mount Evelyn	Olinda Creek	Riverine
-	-	138	York Road	Mount Evelyn	Olinda Creek	Riverine
-	-	52	Richards Road	Montrose	Heathfield Grove Drain	Flash
-	-	30	The Boulevard	Montrose	Heathfield Grove Drain	Flash
95	95	95	Swansea Road	Montrose	Heathfield Grove Drain	Flash
-	-	110	Swansea Road	Montrose	Heathfield Grove Drain	Flash
-	-	144	Swansea Road	Montrose	Heathfield Grove Drain	Flash
-	-	146	Swansea Road	Montrose	Heathfield Grove Drain	Flash
-	-	148	Swansea Road	Montrose	Heathfield Grove Drain	Flash
158	158	158	Swansea Road	Montrose	Heathfield Grove Drain	Flash
-	-	2	Marne Road	Mount Evelyn	Olinda Creek	Riverine
-	-	6	Marne Road	Mount Evelyn	Olinda Creek	Riverine
-	-	362	Swansea Road	Mount Evelyn	Fuller Road Drain	Flash
-	-	72-86	Main Street	Lilydale	Olinda Creek	Riverine
-	-	88	Main Street	Lilydale	Olinda Creek	Riverine
-	-	90	Main Street	Lilydale	Olinda Creek	Riverine
-	-	92	Main Street	Lilydale	Olinda Creek	Riverine
-	-	94	Main Street	Lilydale	Olinda Creek	Riverine
-	-	96	Main Street	Lilydale	Olinda Creek	Riverine
-	-	98	Main Street	Lilydale	Olinda Creek	Riverine
-	-	100	Main Street	Lilydale	Olinda Creek	Riverine
-	-	102	Main Street	Lilydale	Olinda Creek	Riverine
-	-	104	Main Street	Lilydale	Olinda Creek	Riverine
-	-	106	Main Street	Lilydale	Olinda Creek	Riverine
-	-	108	Main Street	Lilydale	Olinda Creek	Riverine
-	-	110-112	Main Street	Lilydale	Olinda Creek	Riverine
-	-	111-113	Main Street	Lilydale	Olinda Creek	Riverine
-	-	116	Main Street	Lilydale	Olinda Creek	Riverine
-	-	123	Main Street	Lilydale	Olinda Creek	Riverine
-	-	125	Main Street	Lilydale	Olinda Creek	Riverine
179	179	179	Main Street	Lilydale	Olinda Creek	Riverine
-	-	4-6	William Street East	Lilydale	Olinda Creek	Riverine

Properties at risk from Flooding along the Olinda Creek Catchment						
Residential	Commercial	Industrial	Rural	Public Use		
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
5% AEP	2% AEP	1% AEP				
-	-	8	William Street East	Lilydale	Olinda Creek	Riverine
-	-	10	William Street East	Lilydale	Olinda Creek	Riverine
-	-	12	William Street East	Lilydale	Olinda Creek	Riverine
-	-	14	William Street East	Lilydale	Olinda Creek	Riverine
-	-	16-18	William Street East	Lilydale	Olinda Creek	Riverine
-	-	1/26	Chapel Street	Lilydale	Olinda Creek	Riverine
-	-	3/26	Chapel Street	Lilydale	Olinda Creek	Riverine
-	-	4/26	Chapel Street	Lilydale	Olinda Creek	Riverine
-	-	1/22	Hightech Place	Lilydale	Lilydale Drain	Flash
-	-	2/22	Hightech Place	Lilydale	Lilydale Drain	Flash
-	-	3/22	Hightech Place	Lilydale	Lilydale Drain	Flash
-	-	28-30	Hightech Place	Lilydale	Lilydale Drain	Flash
-	-	6/34	Hightech Place	Lilydale	Lilydale Drain	Flash
-	-	60/64-86	Beresford Road	Lilydale	Lilydale Drain	Flash
-	2A	2A	McComb Street	Lilydale	Lilydale Drain	Flash
-	-	85	Cave Hill Road	Lilydale	Lilydale Drain	Flash
89	89	89	Cave Hill Road	Lilydale	Lilydale Drain	Flash
-	91	91	Cave Hill Road	Lilydale	Lilydale Drain	Flash
-	1/95	1/95	Cave Hill Road	Lilydale	Lilydale Drain	Flash
-	-	2/95	Cave Hill Road	Lilydale	Lilydale Drain	Flash
-	109	109	Cave Hill Road	Lilydale	Lilydale Drain	Flash
-	-	111	Cave Hill Road	Lilydale	Lilydale Drain	Flash
-	53A	53A	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	55	Beresford Road	Lilydale	Lilydale Drain	Flash
55A	55A	55A	Beresford Road	Lilydale	Lilydale Drain	Flash
-	57	57	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	59	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	1/61	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	2/61	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	3/61	Beresford Road	Lilydale	Lilydale Drain	Flash
-	62	62	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	63	Beresford Road	Lilydale	Lilydale Drain	Flash
-	63A	63A	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	65	Beresford Road	Lilydale	Lilydale Drain	Flash
-	-	32	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	34	34	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	36	36	Morokai Grove	Lilydale	Lilydale Drain	Flash
38	38	38	Morokai Grove	Lilydale	Lilydale Drain	Flash
40	40	40	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	42	42	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	44	44	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	-	45	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	-	46	Morokai Grove	Lilydale	Lilydale Drain	Flash

Properties at risk from Flooding along the Olinda Creek Catchment						
Residential	Commercial	Industrial	Rural	Public Use		
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
5% AEP	2% AEP	1% AEP				
47	47	47	Morokai Grove	Lilydale	Lilydale Drain	Flash
49	49	49	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	51	51	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	-	53	Morokai Grove	Lilydale	Lilydale Drain	Flash
-	12/157-161	12/157-161	Beresford Road	Lilydale	Olinda Creek	Riverine
-	13/157-161	13/157-161	Beresford Road	Lilydale	Olinda Creek	Riverine
-	-	14/157-161	Beresford Road	Lilydale	Olinda Creek	Riverine
-	-	15/157-161	Beresford Road	Lilydale	Olinda Creek	Riverine
35	35	35	Quarry Road	Lilydale	Nelson Road Drain	Flash
-	-	11	MacIntyre Lane	Yering	Olinda Creek	Riverine
-	-	13	MacIntyre Lane	Yering	Olinda Creek	Riverine
-	-	178-180	Victoria Road	Yering	Olinda Creek	Riverine
-	-	192	Victoria Road	Yering	Olinda Creek	Riverine
194	194	194	Victoria Road	Yering	Olinda Creek	Riverine
Totals						
11	**26**	**90**				

Table C5.4 – Properties at risk of flooding along the Olinda Creek catchment in the Yarra Ranges

Properties listed in the table below are at risk from flooding within the Stringybark Creek catchment. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Stringybark Creek (Melbourne Water, June 2016) flood mapping and risk assessment program.

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Properties at risk from Flooding along Stringybark Creek & Lilydale East Drain Catchments during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
10	Cahillton Road	Gruyere	Log Creek	Riverine
35	Killara Road	Coldstream	Stringybark Creek Tributary	Riverine
774-776	Maroondah Highway	Coldstream	Stringybark Creek Tributary	Riverine
689-691	Maroondah Highway	Yering	Stringybark Creek Tributary	Riverine
17-19	MacIntyre Lane	Yering	Stringybark Creek	Riverine
25	MacIntyre Lane	Yering	Stringybark Creek	Riverine
505-507	Maroondah Hwy	Lilydale	Lilydale East Drain Trib	Riverine
509-511	Maroondah Hwy	Lilydale	Lilydale East Drain Trib	Riverine
48	Lauriston Drive	Coldstream	Coldstream Drain	Flash
50	Lauriston Drive	Coldstream	Coldstream Drain	Flash
51	Lauriston Drive	Coldstream	Coldstream Drain	Flash
53	Lauriston Drive	Coldstream	Coldstream Drain	Flash
55	Lauriston Drive	Coldstream	Coldstream Drain	Flash

Properties at risk from Flooding along Stringybark Creek & Lilydale East Drain Catchments during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
9	Fintona Court	Coldstream	Coldstream Drain	Flash
10	Fintona Court	Coldstream	Coldstream Drain	Flash
11	Fintona Court	Coldstream	Coldstream Drain	Flash
12	Fintona Court	Coldstream	Coldstream Drain	Flash
13	Fintona Court	Coldstream	Coldstream Drain	Flash
14	Fintona Court	Coldstream	Coldstream Drain	Flash
15	Fintona Court	Coldstream	Coldstream Drain	Flash
16	Fintona Court	Coldstream	Coldstream Drain	Flash
5	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
7	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
8	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
9	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
10	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
11	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
12	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
14	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
16	Cheviot Avenue	Coldstream	Coldstream Drain	Flash
1	Witham Drive	Coldstream	Coldstream Drain	Flash
3	Witham Drive	Coldstream	Coldstream Drain	Flash
5	Witham Drive	Coldstream	Coldstream Drain	Flash
5A	Witham Drive	Coldstream	Coldstream Drain	Flash
7	Witham Drive	Coldstream	Coldstream Drain	Flash
9	Witham Drive	Coldstream	Coldstream Drain	Flash
11	Witham Drive	Coldstream	Coldstream Drain	Flash
13	Witham Drive	Coldstream	Coldstream Drain	Flash
15	Witham Drive	Coldstream	Coldstream Drain	Flash
17	Witham Drive	Coldstream	Coldstream Drain	Flash
27	North Gateway	Coldstream	Coldstream Drain	Flash
29	North Gateway	Coldstream	Coldstream Drain	Flash
4	Melrose Avenue	Coldstream	Coldstream Drain	Flash
6	Melrose Avenue	Coldstream	Coldstream Drain	Flash
9	Murrac Street	Coldstream	Coldstream Drain	Flash
11	Murrac Street	Coldstream	Coldstream Drain	Flash
13	Murrac Street	Coldstream	Coldstream Drain	Flash
15	Murrac Street	Coldstream	Coldstream Drain	Flash
17	Murrac Street	Coldstream	Coldstream Drain	Flash
611	Maroondah Highway	Coldstream	Coldstream Drain	Flash
623	Maroondah Highway	Coldstream	Coldstream Drain	Flash
629	Maroondah Highway	Coldstream	Coldstream Drain	Flash
635	Maroondah Highway	Coldstream	Coldstream Drain	Flash
670-672	Maroondah Highway	Coldstream	Coldstream Drain	Flash
30	Station Street	Coldstream	Coldstream Drain	Flash
32	Station Street	Coldstream	Coldstream Drain	Flash
54	Station Street	Coldstream	Lilydale East Drain	Flash

Properties at risk from Flooding along Stringybark Creek & Lilydale East Drain Catchments during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
56	Station Street	Coldstream	Lilydale East Drain	Flash
58	Station Street	Coldstream	Lilydale East Drain	Flash
60	Station Street	Coldstream	Lilydale East Drain	Flash
62-64	Station Street	Coldstream	Lilydale East Drain	Flash
66	Station Street	Coldstream	Lilydale East Drain	Flash
68	Station Street	Coldstream	Lilydale East Drain	Flash
72	Station Street	Coldstream	Lilydale East Drain	Flash
74	Station Street	Coldstream	Lilydale East Drain	Flash
76	Station Street	Coldstream	Lilydale East Drain	Flash
80	Station Street	Coldstream	Lilydale East Drain	Flash
82	Station Street	Coldstream	Lilydale East Drain	Flash

Total
68

Table C5.5 – Properties at risk of flooding along the Stringybark Creek catchment in the Yarra Ranges

Isolation

No major isolation risks exist for areas around Mount Evelyn, Lilydale, Coldstream, Wandin North, Gruyere & Yering during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Mount Evelyn, Lilydale & Coldstream are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding around Mount Evelyn, Lilydale, Coldstream, Wandin North, Gruyere & Yering. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads flooded in a 1% AEP (100yr ARI) event
• Clegg Road, Wandin North at Forest Road (Stringybark Creek)
• Maroondah Highway, Coldstream at Killara Road (Coldstream Drain)
• Swansea Road, Mount Evelyn near York Road (Olinda Creek)
• Swansea Road, Lilydale at Lilydale Lake (Hereford Road Drain)
• York Road, Mount Evelyn at Tramway Road and Inverness Road (Olinda Creek)

Table C5.6 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads flooded in a 1% AEP (100yr ARI) event			
COLDSTREAM	**GRUYERE**	• Industry Park Drive	**MOUNT EVELYN**
• Cheviot Avenue	• Cahillton Road	• John Street	• Hunter Road
• Coldstream West Road	• Killara Road	• Main Street service lane north	• Nicholson Crescent
• Fintona Court	**LILYDALE**	• Main Street service lane south	• Tramway Road
• Gateway North	• Akarana Road	• Morokai Grove	**YERING**
• Ingram Road	• Beresford Road	• Nelson Road	• MacIntyre Lane
• Killara Road	• Cave Hill Road	• Quarry Road	• St Huberts Road
• Lauriston Drive	• Chapel Street	• William Street East	• Victoria Road
• Murrac Street	• Hightech Place	**MONTROSE**	
• Station Street	• Hull Road	• Park Road	
• Witham Drive	• Industry Court	• The Avenue	

Table C5.7 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses in Flow Path (sunny day)	Melway Reference
Lilydale Lake, Lilydale	Olinda Creek	108.0m AHD	108.0m AHD	108.2m AHD	6.4m 108.2m AHD	1397ML	High B	12	38 F7

Table C5.8 – Melbourne Water Retarding Basins within the Olinda Creek catchment in the Yarra Ranges

No formal Pumping Stations, Levees or Weirs exist along Olinda Creek around Mount Evelyn, Lilydale & Coldstream.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located along the Olinda and Stringybark Creeks and their stormwater tributaries is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Mount Evelyn Reserve	Olinda Creek	South	Yarra Valley Water	Mount Evelyn Reserve on Tramway Road, Mount Evelyn	120 C3
Keith Hume Fraser Reserve	Cambridge Road Drain	-	Yarra Valley Water	Keith Hume Fraser Reserve on Swansea Road, Mount Evelyn	52 F5
Station Street (Coldstream)	Coldstream Drain	-	Yarra Valley Water	Station Street, Coldstream	281 A8
Septic Tank Properties	Lilydale East Drain	-	Yarra Valley Water	Station Street, Coldstream	280 K8
Stewart Avenue	Stringybark Creek	East	Yarra Valley Water	Warburton Highway, Wandin North at Stringybark Creek crossing	119 A10

Table C5.9 – Sewer Pumping Stations within the Olinda Creek and Stringybark Creek Catchments close to waterways

Sewer Emergency Relief Points

There is a Sewer Emergency Relief Point along Olinda Creek that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Olinda Creek	South	Yarra Valley Water	Mount Evelyn Reserve on Tramway Road, Mount Evelyn	120 C3

Table C5.10 – Sewer Emergency Relief Points in the Olinda Creek and Stringybark Creek Catchments close to waterways

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Olinda and Stringybark Creeks and their stormwater tributaries at various creek heights or rain totals. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Olinda Creek at Mount Evelyn
- Olinda Creek at Lilydale Lake
- Olinda Creek at Yering
- Olinda Creek's Stormwater Tributaries
- Stringybark Creek at Yering

FLOOD INTELLIGENCE CARD – MOUNT EVELYN GAUGE, OLINDA CREEK

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION	**South bank of the creek, East side of York Road bridge at Tramway Rd**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229690A**
STREAM:	**Olinda Creek**
GAUGE NUMBER:	**229690A**
GAUGE ZERO:	**133.772m AHD**
GAUGE TYPE	**Stream Level & Rain**

MELWAY REFERENCE:	**120 A3**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**1.43m (30th July 1996)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
2.23m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **5 Properties in Total** • 132-134, 136 & 138 York Road, Mount Evelyn • 2 & 6 Marne Road, Mount Evelyn **Community Infrastructure Flooded** • York on Lilydale Resort on York Road, Mount Evelyn • Olinda Creek Trail between York Road & Lilydale Lake **Essential Infrastructure Likely Impacted** • Bus Routes 663 and 679 along York Road, Mount Evelyn • Bus Routes 663 and 964 along Swansea Road, Mount Evelyn • Bus Route 680 on Hull Road, Lilydale **Water Over Road** • Tramway Road, Mount Evelyn at York Road • York Road, Mount Evelyn at Tramway Road and Inverness Road • Swansea Road, Mount Evelyn near York Road • Hull Road, Lilydale near Swansea Road • Akarana Road, Lilydale	

Table C5.11 – Breakdown of likely consequences at various Mount Evelyn gauge level heights along Olinda Creek with operational considerations

FLOOD INTELLIGENCE CARD – LILYDALE LAKE GAUGE, OLINDA CREEK

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**Lilydale Lake on Swansea Road, Lilydale**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229672A**
STREAM:	**Olinda Creek**
GAUGE NUMBER:	**229672A**
GAUGE ZERO:	**100.0m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**38 F6**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
SPILLWAY LEVEL:	**8.0m (108.0m AHD)**
HIGHEST RECORDED FLOOD:	**5.55m (30th July 1996)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
6.6m	5% AEP (20yr ARI) Flood Level	**Properties at Flood Risk** **8 Properties in Total** • 179 Main Street, Lilydale (Melba Park) • 89 Cave Hill Road, Lilydale • 55A Beresford Road, Lilydale • 38, 40, 47 & 49 Morokai Grove, Lilydale • 35 Quarry Road, Lilydale **Community Infrastructure Flooded** • Parts of Melba Park at the end of Chapel Street, Lilydale • Nelson Road walking trail • Mt Lilydale Mercy College Sports Grounds on Quarry Road, Lilydale **Essential Infrastructure Flooded** • Bus Route 677 along Cave Hill Road, Lilydale **Water Over Road (above 300mm depth)** • Beresford Road, Lilydale • Cave Hill Road, Lilydale near Beresford Road • Morokai Grove, Lilydale at a low point near Cave Hill Road	
7.6m	2% AEP (50yr ARI) Flood Level	**Properties at Flood Risk** **15 New at Level; 23 Properties in Total**	

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 2A McComb Street, Lilydale • 91, 1/95 & 109 Cave Hill Road, Lilydale • 53A, 57, 62, 63A & Factories 12-13/157-161 Beresford Road, Lilydale • 34, 36, 42, 44, 51 Morokai Grove, Lilydale **Water Over Road (above 300mm depth)** • Nelson Road, Lilydale at Quarry Road • Quarry Road, Lilydale at Yarra Valley Water Depot	
8.0m		• Spillway starts activating • Full Supply Level Reached	
8.2m	1% AEP (100yr ARI) Flood Level	• Embankment Crest Height Reached **Properties at Flood Risk** **48 New at Level; 71 Properties in Total** • 72-86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110-112, 111-113, 116, 123 & 125 Main Street, Lilydale • 4-6, 8, 10, 12, 14 & 16-18 William Street East, Lilydale • 1/26, 3/26 & 4/26 Chapel Street, Lilydale • Factories 1-3/22, 28-30 & 6/34 Hightech Place, Lilydale • 55, 59, Units 1-3/61, 63, 65, 60/64-86 & Factories 14-15/157-161 Beresford Road, Lilydale • 85, 2/95 & 111 Cave Hill Road, Lilydale • 32, 45, 46 & 53 Morokai Grove, Lilydale **Essential Infrastructure Flooded** • Lilydale Train Station Car Park • Bus Route 670 along John Street and William Street East, Lilydale • Bus Terminal at Lilydale Railway Station servicing routes 683, 684, 685 and 965 **Water Over Road (above 300mm depth)** • John Street, Lilydale at William Street East and at the Clarke Street low-point • William Street East, Lilydale • Main Street south side Service Lane, Lilydale between Cave Hill Road and Hutchinson Street • Main Street north side Service Lane, Lilydale near Lilydale Train Station • Chapel Street, Lilydale • Hightech Place, Lilydale • Industrial Park Drive, Lilydale • Industry Court, Lilydale	

Table C5.12 – Breakdown of likely consequences at various Lilydale gauge level heights along Olinda Creek with operational considerations

FLOOD INTELLIGENCE CARD – YERING GAUGE, OLINDA CREEK

Version 1 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**West bank of the creek, south side of MacIntyre Lane bridge**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229258A**
STREAM:	**Olinda Creek**
GAUGE NUMBER:	**229258A**
GAUGE ZERO:	**66.93m AHD**
GAUGE TYPE:	**Stream Level & Flow**

MELWAY REFERENCE:	**280 H1**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**2.75m (5th February 2011)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.67m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **5 Properties in Total** • 11 & 13 MacIntyre Lane, Yering • 178-180, 192 & 194 Victoria Road, Yering **Community Infrastructure Likely Flooded** • Spadoni Nature Reserve at 194 Victoria Road, Yering **Essential Infrastructure Likely Impacted** • Lilydale Airport at 13 MacIntyre Lane, Yering **Tourism / Recreation Likely Impacted** • Melbourne Gun Club at 192 Victoria Road, Yering • Yering Meadows Golf Course at 178-180 Victoria Road, Yering **Water Over Road** • Coldstream West Road, Coldstream • MacIntyre Lane, Yering	

Table C5.13 – Breakdown of likely consequences at various Yering gauge level heights along Olinda Creek with operational considerations

FLOOD INTELLIGENCE CARD – OLINDA CREEK STORMWATER TRIBUTARIES (UNGAUGED)

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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CLOSEST RAIN GAUGE:	**Olinda Creek at Lilydale Lake**
LOCATION:	**Lilydale Lake on Swansea Road, Lilydale**
RECENT RAINFALL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229672A**

MELWAY REF:	**38 F6**
GAUGE NUMBER:	**229672A**
GAUGE TYPE:	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Consideration**
15mm in 10 mins; 24mm in 30 mins; 30mm in 1 hour; 37mm in 2 hours; 43mm in 3 hours; or 57mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	5% AEP (20-year ARI)	**Properties at Flood Risk** **2 Properties in Total** **Heathfield Grove Drain** • 95 & 158 Swansea Road, Montrose **Community Infrastructure Flooded** **Hereford Road Drain** • Lilydale Lake Picnic Area **Heathfield Grove Drain** • Goodstart Early Learning Centre at 158 Swansea Road, Montrose • Keith Hume Fraser Reserve at 95 Swansea Road, Montrose **Water Over Road (above 300mm depth)** **Hereford Road Drain** • Swansea Road, Lilydale at Lilydale Lake **Heathfield Grove Drain** • Swansea Road, Mount Evelyn near York Road **York Road Drain** • York Road, Mount Evelyn at Inverness Road	
18mm in 10 mins; 29mm in 30 mins; 35mm in 1 hour;	2% AEP (50-year ARI)	**Community Infrastructure Flooded** **Hereford Road Drain** • Lilydale Lake Picnic Area **Heathfield Grove Drain**	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
43mm in 2 hours; 50mm in 3 hours; or 67mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.		• Goodstart Early Learning Centre at 158 Swansea Road, Montrose • Keith Hume Fraser Reserve at 95 Swansea Road, Montrose **Water Over Road (above 300mm depth)** **Hereford Road Drain** • Swansea Road, Lilydale at Lilydale Lake **Fuller Road Drain** • Nicholson Crescent, Mount Evelyn **Heathfield Grove Drain** • The Avenue, Montrose • Swansea Road, Mount Evelyn near York Road **York Road Drain** • York Road, Mount Evelyn at Inverness Road	
21mm in 10 mins; 33mm in 30 mins; 39mm in 1 hour; 48mm in 2 hours; 55mm in 3 hours; or 75mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100-year ARI)	**Properties at Flood Risk** **71 Properties in Total** **Heathfield Grove Drain** • 52 Richards Road, Montrose • 30 The Boulevard, Montrose • 95, 110, 144, 146, 148 & 158 Swansea Road, Montrose **Fuller Road Drain** • 362 Swansea Road, Mount Evelyn **Lilydale East Drain Tributary** • 505-507 & 509-511 Maroondah Highway, Lilydale **Coldstream Drain** • 48, 50, 51, 53 & 55 Lauriston Drive, Coldstream • 9, 10, 11, 12, 13, 14, 15 & 16 Fintona Court • 5, 7, 8, 9, 10, 11, 12, 14 & 16 Cheviot Avenue, Coldstream • 1, 3, 5, 5A, 7, 9, 11, 13, 15 & 17 Witham Drive, Coldstream • 27 & 29 North Gateway, Coldstream • 4 & 6 Melrose Avenue, Coldstream • 9, 11, 13, 15 & 17 Murrac Street, Coldstream • 611, 623, 629, 635 & 670-672 Maroondah Highway • 30, 32, 54, 56, 58, 60, 62-64, 66, 68, 72, 74, 76, 80 & 82 Station Street, Coldstream **Community Infrastructure Flooded** **Hereford Road Drain** • Lilydale Lake Picnic Area **Heathfield Grove Drain** • Goodstart Early Learning Centre at 158 Swansea Road, Montrose • Keith Hume Fraser Reserve at 95 Swansea Road, Montrose **Water Over Road (above 300mm depth)** **Hereford Road Drain**	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
		• Swansea Road, Lilydale at Lilydale Lake **Fuller Road Drain** • Nicholson Crescent, Mount Evelyn **Heathfield Grove Drain** • The Avenue, Montrose • Park Road, Montrose • Swansea Road, Mount Evelyn near York Road **York Road Drain** • York Road, Mount Evelyn at Inverness Road **Coldstream Drain** • Cheviot Avenue, Coldstream • Fintona Court, Coldstream • Gateway North, Coldstream • Lauriston Drive, Coldstream • Murrac Street, Coldstream • Station Street, Coldstream • Witham Drive, Coldstream	

Table C5.14 – Breakdown of possible consequences at various rainfall intensities around the Olinda Creek Tributaries in Montrose, Mount Evelyn & Lilydale with operational considerations

FLOOD INTELLIGENCE CARD – YERING GAUGE, STRINGYBARK CREEK

Version 2 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**East bank of the creek, south side of St Huberts Rd, Yering**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229247B**
STREAM:	**Stringybark Creek**
GAUGE NUMBER:	**229247B**
GAUGE ZERO:	**69.23m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**275 F11**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**2.28m (2nd July 2012)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.19m	20% AEP (5yr ARI) Flood Level		
2.33m	10% AEP (10yr ARI) Flood Level		
2.52m	5% AEP (20yr ARI) Flood Level		
2.60m		**Water Over Road** • St Huberts Road, Yering • Melba Highway Yering	
2.72m	2% AEP (50yr ARI) Flood Level		
2.84m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **6 Properties in Total** **Log Creek** • 10 Cahilton Road, Gruyere **Stringybark Creek Tributary** • 35 Kilara Road, Coldstream • 774-776 & 689-691 Maroondah Highway, Coldstream	

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Stringybark Creek • 17-19 & 25 MacIntyre Lane, Yering **Water Over Road** • Hunter Road, Mount Evelyn • Clegg Road, Wandin North at Forest Road • Cahilton Road, Gruyere • Kilara Road, Gruyere • Ingram Road, Coldstream • Maroondah Highway, Coldstream at Kilara Road • Victoria Road, Yering	

Table C5.15 – Breakdown of likely consequences at various Yering gauge level heights along Olinda Creek with operational considerations

APPENDIX C6 – BRUSHY CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Brushy Creek and its stormwater tributaries in Shire of Yarra Ranges

Property					
Properties	**32**	Identified as over-floor flooding risks			
Residential	12				
Commercial	14	Brice Avenue shops			
Industrial	0				
Public Land	6				
Rural	0				
Community Infrastructure					
Child Care / Kindergartens	1	Manchester Preschool			
Community Venues	1	Mooroolbark Plaza Shopping Centre			
Essential Infrastructure					
Major Roads	1	Hull Road at 5-ways Intersection			
Major Rail	1	Lilydale Railway Line at Mooroolbark Station (pre LXR works)			
Bus Routes	2	680 and 689			
Sewerage Facilities	5	3 Pumping Stations and 2 Emergency Relief Points			
Levees	1	Maroondah Hwy to Moana Drive			
Drainage Facilities	8	Retarding Basins			
Tourism / Recreation					
Sports Facilities	1	Esther Park & Soccer Grounds			
Recreation Facilities	5	Balcombe Ave Reserve, Elizabeth Bridge Reserve, Greenslopes Reserve, Pembroke Basin Reserve, Red Earth Community Park (Brice Ave Reserve)			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Maroondah and Manningham	CFA District	1	District 13
SES Unit Area	1	Lilydale	FRV District	0	

Table C6.1 – Consequence Summary of 1% AEP flood along Brushy Creek and its stormwater tributaries in the Shire of Yarra Ranges

Brushy Creek, with a relatively small catchment area and with a creek length of approximately 14km starts in Mooroolbark as a number of underground drains. These drains connect together at various locations in Mooroolbark before becoming the open waterway of Brushy Creek in Mooroolbark's town centre near the Railway Station and Brice Avenue shops. Brushy Creek then flows north for approximately 10km where it joins the Yarra River in Wonga Park.

Because of the small catchment size, the urban environment and shallow creek, this area is area is susceptible to flash flooding with the creek rising fairly quickly during an intense rainfall event. A river level gauge is located on Diane Crescent in Mooroolbark to monitor flood levels but because of the rapid rise of the creek no warnings are able to be issued by Melbourne Water.

Key infrastructure at risk in the Brushy Creek catchment are the Brice Avenue shopping precinct, Manchester Road and a number of residential properties to the north and southeast of the five-ways roundabouts on Hull Road.

A number of Retarding Basins are present in the area designed to reduce these flooding impacts. A Levee also exists on both banks of Brushy Creek from Dianne Crescent in Mooroolbark to Bellara Drive. This levee protects a number of properties along Esther Crescent and adjoining streets as well as properties along Lee Anne Crescent in the City of Maroondah.

Gauges and Warnings

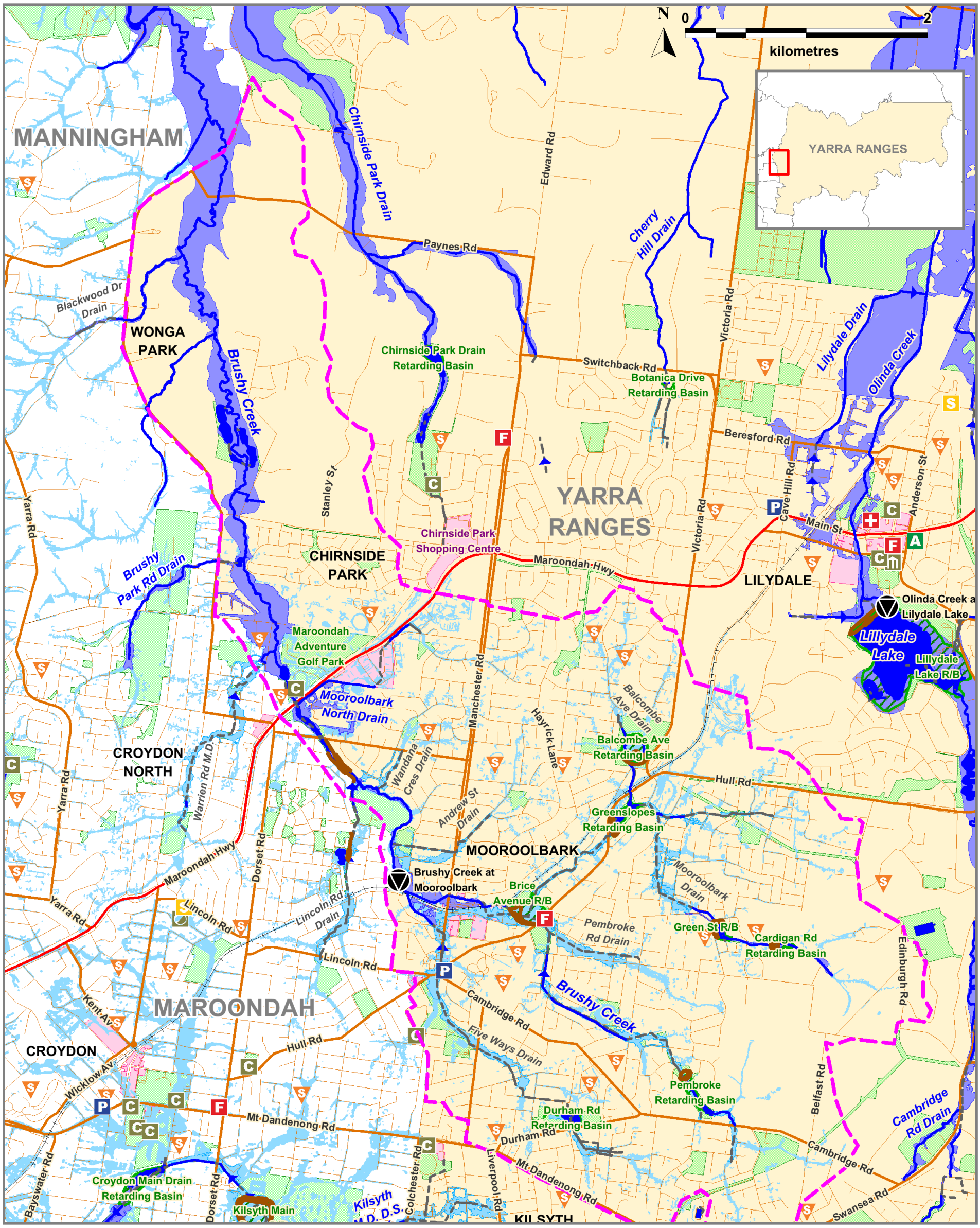
Whilst there are flood level gauges within the Brushy Creek catchment, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Brushy Creek at Mooroolbark	229249A	West side of Creek on Diane Cr, Mooroolbark	✓	✓		Melway 37 E11
Brushy Creek at Wonga Park	229252A	Lower Homestead Road, Wonga Park	Staff Gauge Only			Melway 279 B10

Table C6.2 – Hydrographic Monitoring Stations within the Brushy Creek catchment

This gauge may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk around Brushy Creek and its stormwater tributaries



Flood Modelling completed by Engeny, February 2019. Map Produced by VicSES September 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

Areas of flood risk along Brushy Creek

- 1% AEP Riverine Flood Extent
- 1% AEP Flash Flood Extent
- Waterbody
- Park / Reserve
- Melbourne Water Retarding Basin
- River / Creek / Channel
- Area Boundary for this Appendix
- Levee / Embankment
- Melbourne Water Stormwater Drain
- Community Centre
- School / College
- Fire Station
- VicSES Unit
- Tide Level Gauge
- Rain Gauge
- Police Station
- Ambulance Station
- Municipal Offices
- Caravan Park
- Hospital

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Figure C6 – Areas of flood risk along Brushy Creek in Kilsyth, Mooroolbark & Chirnside Park in the Shire of Yarra Ranges.

Properties at Flood Risk

Properties listed in the table below are at risk from flooding over-floor in a 1% AEP flood event around Brushy Creek and its stormwater tributaries in the Shire of Yarra Ranges. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Maroondah Flood Mapping (Engeny, February 2019) flood mapping and risk assessment program. Note that any multi-lot properties situated above ground floor likely impacted by isolation only with flooding on ground floor impacting access to common areas and/or carpark and storage facilities. Information on above ground-floor properties is not available in this list.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding over-floor along Brushy Creek and its stormwater tributaries in the Shire of Yarra Ranges

Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
20% AEP	5% AEP	1% AEP				
	✓	✓	102 Bellara Drive	Mooroolbark	Brushy Creek	Flash
		✓	5/61 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	65 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	71 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	9/79B Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	12/81A Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	81 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	85 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	87 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	4/91-111 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	5/91-111 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	8/91-111 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	9/91-111 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	10/91-111 Brice Avenue	Mooroolbark	Brushy Creek	Flash
		✓	11/91-111 Brice Avenue	Mooroolbark	Brushy Creek	Flash
	✓	✓	280 Cambridge Road	Kilsyth	Brushy Creek	Flash
		✓	67 Cardigan Road	Mooroolbark	Pembroke Rd Drain	Flash
	✓	✓	43 Diane Crescent	Mooroolbark	Brushy Creek	Flash
	✓	✓	25B Esther Crescent	Mooroolbark	Brushy Creek	Flash
	✓	✓	25A Esther Crescent	Mooroolbark	Brushy Creek	Flash
	✓	✓	1/25 Esther Crescent	Mooroolbark	Brushy Creek	Flash
✓	✓	✓	70 Hawthory Road	Kilsyth	Five Ways Drain	Flash
		✓	3/14-16 Kipling Avenue	Mooroolbark	Pembroke Rd Drain	Flash
		✓	4/14-16 Kipling Avenue	Mooroolbark	Pembroke Rd Drain	Flash
		✓	132 Manchester Road	Mooroolbark	Andrew Street Drain	Flash
		✓	12 Neville Street	Mooroolbark	Andrew Street Drain	Flash
		✓	14 Neville Street	Mooroolbark	Andrew Street Drain	Flash
	✓	✓	16 Neville Street	Mooroolbark	Andrew Street Drain	Flash

Properties at risk from Flooding over-floor along Brushy Creek and its stormwater tributaries in the Shire of Yarra Ranges							
Residential			Commercial	Industrial	Rural	Public Use	
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type	
20% AEP	5% AEP	1% AEP					
	✓	✓	18 Neville Street	Mooroolbark	Andrew Street Drain	Flash	
		✓	2 Willow Court	Kilsyth	Brushy Creek	Flash	
	✓	✓	4 Willow Court	Kilsyth	Brushy Creek	Flash	
		✓	5 Willow Court	Kilsyth	Brushy Creek	Flash	
Totals							
1	10	32					

Table C6.3 – Properties at risk of flooding over-floor along Brushy Creek and its stormwater tributaries in the Shire of Yarra Ranges

Isolation

No major isolation risks exist for areas around Mooroolbark & Chirnside Park during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

Lilydale Railway Line may be flooded near Mooroolbark Railway Station. Mooroolbark Station car-park likely to be flooded. Conditions likely changed once level-crossing removal project completed (2022) with rail bridges constructed over Manchester Road.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas along Brushy Creek in Kilsyth, Mooroolbark & Chirnside Park are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding around Mooroolbark & Chirnside Park. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event
• Hull Road, Mooroolbark at the 5-ways roundabout intersection

Table C6.4 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads likely flooded in a 1% AEP (100yr ARI) event			
CHIRNSIDE PARK	**KILSYTH**	• Carolanne Court	• Lorna Court
• Black Springs Road	• Willow Court	• Carronvale Road	• Manchester Road
• Glenpark Drive	**MOOROOLBARK**	• Croydondale Drive	• McDermott Avenue
• Lower Homestead Road	• Bainbridge Court	• Dallas Court	• Rachael Drive
• Paynes Road	• Brice Avenue	• Esther Crescent	• Ricky Court
• Ramset Drive	• Campbell Street	• Hawthory Road	• Wordsworth Street
• Uplands Road	• Cardigan Road	• Kathy Court	• Zina Grove

Table C6.5 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses in Flow Path (sunny day)	Melway Reference
Brice Avenue, Mooroolbark	Brushy Creek	92.07m AHD	92.4m AHD	92.75m AHD	3.0m 93.6m AHD	33.1ML	High C	Unavailable	37 H12
Balcombe Ave, Mooroolbark	Balcombe Ave Drain	119.0m AHD	117.5m AHD	119.5m AHD	4.9m 119.5m AHD	84ML	High C	6	37 K9
Cardigan Rd, Mooroolbark	Mooroolbark Drain	140.5m AHD	140.1m AHD	140.75m AHD	7.5m 141.0m AHD	20.5ML	High C	7	52 C1
Chirnside Park Drain, Chirnside Park	Chirnside Park Drain	82.9m AHD	Unavailable	82.4m AHD	2.6m 88.46m AHD	25ML	Very Low	0	37 F1
Durham Rd, Kilsyth	Five Ways Drain	N/A	105.82m AHD	Unavailable	1.55m 107.25m AHD	12ML	Very Low	0	51 H4
Green St, Mooroolbark	Mooroolbark Drain	126.2m AHD	125.85m AHD	126.4m AHD	4.0m 126.4m AHD	33.0ML	High C	37	52 B1
Greenslopes, Mooroolbark	Mooroolbark Drain	104.7m AHD	104.7m AHD	105.0m AHD	4.0m 105.0m AHD	38.5ML	Low	3	37 K10
Pembroke, Mooroolbark	Brushy Creek	125.7m AHD	125.34m AHD	126.0m AHD	6.2m 126.2m AHD	43.9ML	High C	9	52 A4

Table C6.6 – Melbourne Water Retarding Basins within the Brushy Creek catchment in the Shire of Yarra Ranges

Levees

Melbourne Water Levee	Reach	Side	Levee Height	Levee Length	Expected Level of Protection	ANCOLD Hazard Rating	Houses at risk behind Levee	Melway Reference
Brushy Creek	Maroondah Highway to Moana Drive	East	1.0m (77.0m AHD)	695m	100yr ARI flood level	Low	1	37 D9

Table C6.7 – Melbourne Water Levees in the Brushy Creek Catchment in the Yarra Ranges

No formal Pumping Stations exist around Kilsyth, Mooroolbark and Chirnside Park.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Brushy Creek and its stormwater tributaries is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Brushy Creek	Brushy Creek	East	Yarra Valley Water	Yarra Valley Water Brushy Creek Treatment Plant on Maroondah Hwy, Chirnside Park	37 C7
Pezzimenti Place	Brushy Park Road Drain	-	Yarra Valley Water	Pezzimenti Place, Chirnside Park	37 B5
Wonga Park	Blackwood Drive Drain	North	Yarra Valley Water	Homestead Road, Wonga Park	24 K12

Table C6.8 – Sewer Pumping Stations within the Brushy Creek Catchment in the Shire of Yarra Ranges

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along Brushy Creek and its stormwater tributaries that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Blackwood Drive Drain	North	Yarra Valley Water	Homestead Road, Wonga Park	24 K12
Local Drainage	-	Yarra Valley Water	Brushy Park Road, Chirnside Park	37 B4

Table C6.9 – Sewer Emergency Relief Points in the Brushy Creek Catchment in the Shire of Yarra Ranges

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Brushy Creek and its stormwater tributaries at various creek heights or rain totals within the Shire of Yarra Ranges. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Brushy Creek at Mooroolbark

FLOOD INTELLIGENCE CARD – MOOROOLBARK GAUGE, BRUSHY CREEK

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. ***Scan the QR code for the current levels for this gauge.***

LOCATION:	**West side of Creek on Diane Cr, Mooroolbark**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229249A**
STREAM:	**Brushy Creek**
GAUGE NUMBER:	**229249A**
GAUGE ZERO:	**79.95m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**37 E11**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**2.93m (77.0m AHD)**
HIGHEST RECORDED FLOOD:	**3.07m (29th July 1987)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
2.34m	20% AEP (5yr ARI) Flood Level	**Properties at Flood Risk (Over-Floor)** **1 Property in Total** **Five Ways Drain** • 70 Hawthory Road, Kilsyth **Community Infrastructure Likely Flooded** • Balcombe Avenue Reserve on Balcombe Avenue, Mooroolbark • Greenslopes Reserve on Greenslopes Drive, Mooroolbark • Pembroke Basin Reserve on Cambridge Road, Mooroolbark • Red Earth Community Park (Brice Avenue Reserve) on Brice Avenue, Mooroolbark **Water Over Road (over 300mm depth)** • Ricky Court, Mooroolbark • Croydondale Drive, Mooroolbark • Cardigan Road, Mooroolbark	
2.48m	10% AEP (10yr ARI) Flood Level	**Properties at Flood Risk (Over-Floor)** **0 New at Level; 1 Properties in Total** **Community Infrastructure Likely Flooded** • Elizabeth Bridge Reserve on Durham Road, Kilsyth **Essential Infrastructure Likely Impacted** • Bus Route 689 along Hawthory Road, Kilsyth	

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
		Water Over Road (over 300mm depth) • Hawthory Road, Mooroolbark at Kilsyth Swimming Pool	
2.50m	5% AEP (20yr ARI) Flood Level	**Properties at Flood Risk (Over-Floor)** **9 New at Level; 10 Properties in Total** • 102 Bellara Drive, Mooroolbark • 280 Cambridge Road, Kilsyth • 43 Diane Crescent, Mooroolbark • 25A, 25B & 1/25 Esther Crescent, Mooroolbark • 16 & 18 Neville Street, Mooroolbark • 4 Willow Court, Kilsyth **Community Infrastructure Likely Flooded** • Esther Park & Soccer Grounds on Esther Crescent, Mooroolbark **Essential Infrastructure Likely Impacted** • Bus Route 689 at the 5-ways Intersection, Hull Road, Mooroolbark **Water Over Road (over 300mm depth)** • Bainbridge Court, Mooroolbark • Carronvale Road, Mooroolbark • Dallas Court, Mooroolbark • Hull Road, Mooroolbark at the 5-ways roundabout intersection • Lorna Court, Mooroolbark • Ramset Drive, Chirnside Park • Willow Court, Kilsyth	
2.55m	2% AEP (50yr ARI) Flood Level	**Properties at Flood Risk (Over-Floor)** **14 New at Level; 24 Properties in Total** • 65, 71, 9/79B, 12/81A, 81, 85, 87, 5/91-111, 8/91-111, 9/91-111, 10/91-111 & 11/91-111 Brice Avenue, Mooroolbark • 12 Neville Street, Mooroolbark • 5 Willow Court, Kilsyth **Community Infrastructure Likely Flooded** • Manchester Preschool on Manchester Road, Mooroolbark • Mooroolbark Plaza Shopping Centre on Brice Avenue, Mooroolbark **Essential Infrastructure Likely Impacted** • Bus Route 680 along Brice Avenue, Mooroolbark **Water Over Road (over 300mm depth)** • Brice Avenue, Mooroolbark • Campbell Street, Mooroolbark • Carolanne Court, Mooroolbark • Glenpark Drive, Chirnside Park • Kathy Court, Mooroolbark • McDermott Avenue, Mooroolbark	

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
		• Zina Grove, Mooroolbark	
2.87m	5th February 2011 Flood Level Peak	**Event Summary** • Nil Information Available	
2.93m	1% AEP Flood Level (100yr ARI)	**Properties at Flood Risk (Over-Floor)** **8 New at Level; 32 Properties in Total** • 5/61 & 4/91-111 Brice Avenue, Mooroolbark • 67 Cardigan Road, Mooroolbark • 3/14-16 & 4/14-16 Kipling Avenue, Mooroolbark • 132 Manchester Road, Mooroolbark • 14 Neville Street, Mooroolbark • 2 Willow Court, Kilsyth **Essential Infrastructure Flooded** • Levee Height between Maroondah Hwy and Moana Drive, Mooroolbark reached. 1 house (97 Bellara Drive, Mooroolbark) at risk from over-topping. • Lilydale Railway Line may be flooded near Mooroolbark Railway Station. Mooroolbark Station car-park likely to be flooded. Conditions likely changed once level-crossing removal project completed with rail bridges constructed over Manchester Road. **Water Over Road (over 300mm depth)** • Esther Crescent, Mooroolbark at Esther Park • Manchester Road, Mooroolbark near Railway Crossing and near Five-Ways Roundabout • Rachael Drive, Mooroolbark • Wordsworth Street, Mooroolbark Note: It is not known at what level roads contained below start being overtopped • Black Springs Road, Chirnside Park • Lower Homestead Road, Chirnside Park • Paynes Road, Chirnside Park • Uplands Road, Chirnside Park	
3.07m	29th July 1987 Flood Level Peak	**Event Summary** • 60mm of rain recorded over 26 hours • 3 properties on Carronvale Road & Alma Court, Mooroolbark flooded • 3 properties on Taylor Road & Kipling Avenue, Mooroolbark flooded • Croydondale Drive Inundated • Hull Road flooded near Greenslopes Drive • Cardigan Road adjacent to Brushy Creek flooded • Diane Crescent flooded at Brushy Creek • 2 properties on Diane Crescent east of Brushy Creek flooded	

Table C6.8 – Breakdown of likely consequences at various Mooroolbark gauge level heights along Brushy Creek with operational considerations

APPENDIX C7 – BUNGALOOK CREEK & KILSYTH MAIN DRAIN FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Bungalook Creek and the Kilsyth Main Drain in the Shire of Yarra Ranges

Property					
Properties	**32**				
Residential	32				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Care Facilities	2	Kirkbrae Nursing Home and Walmsley Friendship Village Nursing Home			
Retirement Villages	1	Gracevale Grange Retirement Village			
Schools / Colleges	1	Gladesville Drive Primary School Sports Grounds			
Essential Infrastructure					
Bus Routes	1	690 along Liverpool Road			
Sewerage Facilities	2	1 Pumping Station and 1 Emergency Relief Point			
Drainage Facilities	1	Fussel Rd Retarding Basin			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Maroondah	CFA District	1	District 13
SES Unit Area	1	Lilydale	FRV District	0	

Table C7.1 – Consequence Summary of 1% AEP flood along Bungalook Creek and the Kilsyth Main Drain in the Shire of Yarra Ranges

Bungalook Creek begins in the foothills of Mount Dandenong in Montrose with a number of overland flow paths making their way down Mount Dandenong possibly through residential areas adjacent to Sheffield Road causing damage. These flood waters are retarded at the Fussell Road Retarding Basin located at the end of Fussell Road. Downstream, Bungalook creek flows west, crossing Liverpool Road and into the City of Maroondah.

Kilsyth Main Drain is a series of underground drains around the relatively flat terrain in the area bounded by Canterbury Road to the South, Colchester Road to the West and Mount Dandenong Road to the North. Key Infrastructure at risk apart from a number of residential properties are the Gracevale Grange Retirement Village and the Walmsley Friendship Village Nursing Home both with

flooding risks above-floor level. The drainage network flows west, crossing Colchester Road and into the City of Maroondah.

Gauges and Warnings

Whilst there are gauges within the Bungalook Creek catchment, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Bungalook Creek at Fussell Rd R/B, Montrose	228369A	North bank of the creek, 50m east of R/B embankment	✓	✓		Melway 51 K11
Dandenong Creek at Kilsyth South	228242A	Sheffield Road, Kilsyth	Staff Gauge Only			Melway 65 K5

Table C7.2 – Gauges within the Bungalook Creek & Kilsyth Main Drain catchment

This gauge may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk around Bungalook Creek and the Kilsyth Main Drain in the Shire of Yarra Ranges

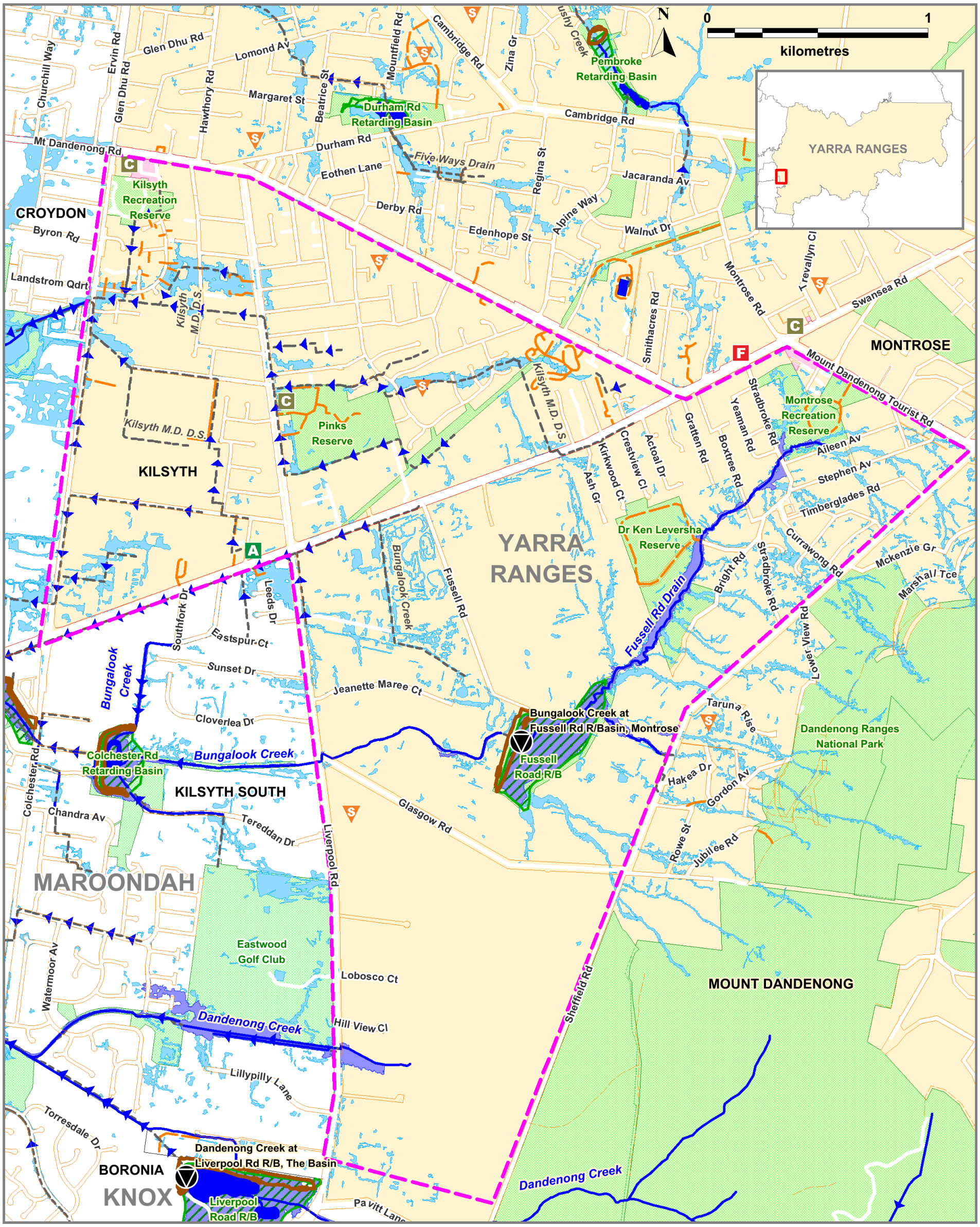

Figure C7 – Areas of flood risk along Bungalook Creek & the Kilsyth Main Drain in the Shire of Yarra Ranges

Properties at Flood Risk

Properties listed in the table below are at risk from flooding above-floor. As more intelligence becomes available, this list may change

Properties at risk from Flooding over-floor during a 1% AEP event					
Residential	Commercial	Industrial	Rural	Public Use	
Street No. at Risk	Street	Suburb	Over-Floor Flooding Risk	Along Melbourne Water Watercourse	Flood Risk Type
5	Aaron Place	Kilsyth	✓	Kilsyth Main Drain	Flash
157	Colchester Road	Kilsyth	✓	Kilsyth Main Drain	Flash
100	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
102	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
103	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
105	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
106	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
107	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
108	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
109	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
110	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
111	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
113	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
115	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
158	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
159	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
163	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
164	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
165	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
166	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
167	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
168	Greeves Drive	Kilsyth	✓	Kilsyth Main Drain	Flash
1/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
2/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
3/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
4/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
5/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
7/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
8/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
9/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
10/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
12/48	Liverpool Road	Kilsyth	✓	Kilsyth Main Drain	Flash
3	Pleasant Street	Kilsyth	✓	Kilsyth Main Drain	Flash
Total					
32					

Table C7.3 – Properties at risk of flooding along the Kilsyth Main Drain catchment in the Shire of Yarra Ranges

Isolation

No major isolation risks exist for areas along Bungalook Creek & Kilsyth Drain in Kilsyth & Montrose during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services http://ptv.vic.gov.au/live-travel-updates/ . A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas along Bungalook Creek & Kilsyth Drain in Kilsyth & Montrose are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding around Kilsyth & Montrose. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Yarra Ranges Council Roads flooded in a 1% AEP (100yr ARI) event	
KILSYTH	**MONTROSE**
• Greeves Drive	• Stradbroke Road
• Hansford Close	
• Liverpool Road at Kilsyth Avenue	
• Mountain View Road	
• Society Court	

Table C7.4 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses in Flow Path (sunny day)	Melway Reference
Fussell Rd, Montrose	Bungalook Creek	151.4m AHD	151.9m AHD	8.49m 152.19m AHD	8.5m 152.2m AHD	302.0ML	High A	15	51 K11

Table C7.5 – Melbourne Water Retarding Basins within the Kilsyth Main Drain catchment in the Yarra Ranges

No formal Pumping Stations or Levees exist around Kilsyth & Montrose.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Bungalook Creek, the Fussel Road Drain and the Kilsyth Main Drain is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Tandara Court	Fussel Road Drain	Southeast	Yarra Valley Water	Tandara Court, Montrose	52 C9

Table C7.6 – Sewer Pumping Stations within the Bungalook Creek and Kilsyth Main Drain Catchments in the Shire of Yarra Ranges

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along the Fussel Road Drain that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Fussel Road Drain	Southeast	Yarra Valley Water	Tandara Court, Montrose	52 C9

Table C7.7 – Sewer Emergency Relief Points within the Bungalook Creek and Kilsyth Main Drain Catchments in the Shire of Yarra Ranges

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Bungalook Creek and the Kilsyth Main Drain at various creek heights or rain totals within the Shire of Yarra Ranges. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Bungalook Creek at Fussel Road Retarding Basin, Montrose
- Kilsyth Main Drain, Kilsyth

FLOOD INTELLIGENCE CARD – MONTROSE GAUGE, BUNGALOOK CREEK

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**North bank of the creek, 50m east of R/B embankment, Montrose**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/228369A**
STREAM:	**Bungalook Creek**
GAUGE NUMBER:	**228369A**
GAUGE ZERO:	**143.70m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**51 K11**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
EMBANKMENT HEIGHT:	**8.50m**
HIGHEST RECORDED FLOOD:	**7.23m (18th September 1984)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
7.23m	18th September 1984 Flood Level Peak	• Nil Information Available	
7.7m		• Spillway Crest Level Reached at Fussell Road Retarding Basin	
8.2m		• Fully Supply Level Reached at Fussell Road Retarding Basin	
8.49m	1% AEP (100yr ARI) Flood Level	**Water Over Road (over 300mm depth)** • Stradbroke Road, Montrose	
8.50m		• Embankment Crest Height Reached at Fussell Road Retarding Basin	

Table C7.8 – Breakdown of likely consequences at various Montrose gauge level heights along Bungalook Creek with operational considerations

FLOOD INTELLIGENCE CARD – KILSYTH DRAIN, KILSYTH (UNGAUGED)

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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CLOSEST RAIN GAUGE:	**Montrose**
LOCATION:	**Bungalook Creek at Fussell Road Retarding Basin, Montrose**
RECENT RAIN:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/228369A**

MELWAY REF:	**51 K11**
GAUGE NUMBER	**228369A**
GAUGE TYPE	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
11mm in 10 mins; 18mm in 30 mins; 23mm in 1 hour; 29mm in 2 hours; 33mm in 3 hours; or 43mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	20% AEP (5-year ARI)	**Properties at Flood Risk (Over-Floor)** **2 Properties in Total** • 167 and 168 Greeves Drive, Kilsyth **Community Infrastructure Likely Flooded** • Walmsley Friendship Village Nursing Home on Greeves Drive, Kilsyth at risk of flooding over-floor (2 separate residences at risk over-floor) **Water Over Road (over 300mm depth)** • Greeves Drive, Kilsyth	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
15mm in 10 mins; 25mm in 30 mins; 31mm in 1 hour; 38mm in 2 hours; 44mm in 3 hours; or 57mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	5% AEP (20-year ARI)	**Properties at Flood Risk (Over-Floor)** **8 Properties in Total** • 157 Colchester Road, Kilsyth • 108, 165, 166, 167 and 168 Greeves Drive, Kilsyth • 1/48 and 7/48 Liverpool Road, Kilsyth **Community Infrastructure Likely Flooded** • Gladesville Drive Primary School on Gladesville Drive, Kilsyth with flooding across sports grounds • Gracevale Grange Retirement Village on Liverpool Road, Kilsyth at risk of flooding over-floor (2 separate residences at risk over-floor with more at risk below-floor) • Walmsley Friendship Village Nursing Home on Greeves Drive, Kilsyth at risk of flooding over-floor (5 separate residences at risk over-floor with more at risk below-floor) **Water Over Road (above 300mm depth)** • Greeves Drive, Kilsyth • Society Court, Kilsyth	
21mm in 10 mins; 33mm in 30 mins; 40mm in 1 hour; 49mm in 2 hours; 56mm in 3 hours; or 75mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100-year ARI)	**Properties at Flood Risk (Over-Floor)** **32 Properties in Total** • 5 Aaron Place, Kilsyth • 157 Colchester Road, Kilsyth • 100, 102, 103, 105, 106, 107, 108, 109, 110, 111, 113, 115, 158, 163, 164, 165, 166, 167 & 168 Greeves Drive, Kilsyth • 1/48, 2/48, 3/48, 4/48, 5/48, 7/48, 8/48, 9/48, 10/48 & 12/48 Liverpool Road, Kilsyth • 3 Pleasant Street, Kilsyth **Community Infrastructure Likely Flooded** • Gladesville Drive Primary School on Gladesville Drive, Kilsyth with flooding across sports grounds • Gracevale Grange Retirement Village on Liverpool Road, Kilsyth at risk of flooding over-floor (16 separate residences at risk over-floor with more at risk below-floor) • Kirkbrae Nursing Home and Hostel at 794 Mt Dandenong Road, Kilsyth likely flooded in common areas of the grounds • Walmsley Friendship Village Nursing Home on Greeves Drive, Kilsyth at risk of flooding over-floor (32 separate residences at risk over-floor with more at risk below-floor) **Essential Infrastructure Likely Impacted** • Bus Route 690 along Liverpool Road, Kilsyth **Over Road (above 300mm depth)** • Greeves Drive, Kilsyth • Hansford Close, Kilsyth • Liverpool Road, Kilsyth at Kilsyth Avenue • Mountain View Road, Kilsyth • Society Court, Kilsyth	

Table C7.7 – Breakdown of possible consequences at various rainfall intensities around the Kilsyth Main Drain with operational considerations

APPENDIX C8 – MONBULK CREEK & FERNY CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Monbulk Creek and Ferny Creek					
Property					
Properties	**33**				
Residential	30				
Commercial	0				
Industrial	0				
Public Land	2				
Rural	1				
Community Infrastructure					
Essential Infrastructure					
Major Roads	3	Belgrave-Hallam Road, Lysterfield Road and Monbulk Road			
Bus Routes	4	663, 694, 697 and 699			
Sewerage Facilities	1	Emergency Relief Point			
Drainage Facilities	3	2 Retarding Basins and 1 Weir			
Tourism / Recreation					
Tourism Infrastructure	1	Puffing Billy Railway Branch Head Office			
Recreation Facilities	1	Belgrave Lake Park			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Knox	CFA District	1	District 13
SES Unit Area	1	Emerald	FRV District	0	

Table C8.1 – Consequence Summary of 1% AEP flood along Monbulk Creek in the Shire of Yarra Ranges

Monbulk Creek begins in Belgrave at the junction of the Sherbrook Creeks on Belgrave-Gembrook Road. A number of infrastructure risks exist along Sherbrook Creek near Monbulk Road including the surrounds of Puffing Billy Railway Station. Monbulk Creek winds its way through Belgrave and Belgrave Heights in a south westerly direction posing some infrastructure risks along Park Drive and also Apsley Road. Monbulk Creek enters a large retarding basin in Lysterfield before continuing west, crossing Lysterfield Road into the City of Knox. Floodwaters are expected to rise fast and also be fast moving because of the hilly terrain.

Ferny Creek runs in a similar direction to Monbulk Creek approximately 1km to the northwest. The creek begins in Ferny Creek, flowing south through Tecoma then Upwey. The predominant risk to infrastructure exists in Upwey where a number of houses reside. The creek empties into Ferny Creek Retarding Basin on the border with the City of Knox before continuing west.

Gauges and Warnings

Whilst there are hydrographic/telemetry stations (river gauges) within the municipality, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Monbulk Creek at Retarding Basin, Lysterfield	228229B	South bank of the creek at the end of Nixon Road, Lysterfield	✓	✓		Melway 83 J2

Table C8.2 – Hydrographic Monitoring Stations within the Monbulk Creek catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk around the Monbulk and Ferny Creeks in the Shire of Yarra Ranges

Flood Modelling completed by Melbourne Water & GHD, Feb 2012. Map Produced by VicSES August 2020.

Figure C8 – Areas of flood risk along Monbulk & Ferny Creeks in Belgrave, Tecoma & Upwey

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Monbulk and Ferny Creeks in the Shire of Yarra Ranges. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Monbulk Creek (Melbourne Water, November 2013) and the Ferny Creek (GHD, February 2012) flood mapping and risk assessment programs.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding during a 1% AEP event

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
13	Alexander Avenue	Upwey	Ferny Creek	Riverine
15	Alexander Avenue	Upwey	Ferny Creek	Riverine
22-24	Alexander Avenue	Upwey	Ferny Creek	Riverine
57	Glenern Avenue	Upwey	Ferny Creek	Riverine
1-5	Hillside Grove	Upwey	Ferny Creek	Riverine
9	Hillside Grove	Upwey	Ferny Creek	Riverine
3/4	Kumbada Avenue	Upwey	Ferny Creek	Riverine
4/4	Kumbada Avenue	Upwey	Ferny Creek	Riverine
5	Kumbada Avenue	Upwey	Ferny Creek	Riverine
7-9	Kumbada Avenue	Upwey	Ferny Creek	Riverine
16	Kumbada Avenue	Upwey	Ferny Creek	Riverine
11	Langford Court	Tecoma	Ferny Creek	Riverine
13	Langford Court	Tecoma	Ferny Creek	Riverine
17	Langford Court	Tecoma	Ferny Creek	Riverine
45	Mahony Street	Upwey	Ferny Creek	Riverine
62	Mahony Street	Upwey	Ferny Creek	Riverine
64	Mahony Street	Upwey	Ferny Creek	Riverine
6	New Road	Upper Ferntree Gully	Ferny Creek	Riverine
1	Apsley Road	Belgrave	Monbulk Creek	Riverine
5	Apsley Road	Belgrave	Monbulk Creek	Riverine
111	Belgrave-Hallam Road	Belgrave	Monbulk Creek	Riverine
38	Bellbird Street	Belgrave	Monbulk Creek	Riverine
371	Lysterfield Road	Lysterfield	Monbulk Creek	Riverine
53	Park Drive	Belgrave	Monbulk Creek	Riverine
65	Park Drive	Belgrave	Monbulk Creek	Riverine
4	Sunnyhill Road	Belgrave	Monbulk Creek	Riverine
49	McNicol Road	Belgrave	Monbulk Creek Tributary	Riverine
50	McNicol Road	Belgrave	Monbulk Creek Tributary	Riverine
52	McNicol Road	Belgrave	Monbulk Creek Tributary	Riverine
53	McNicol Road	Belgrave	Monbulk Creek Tributary	Riverine
63	Monbulk Road	Belgrave	Sherbrooke Creek	Riverine
65-71	Monbulk Road	Belgrave	Sherbrooke Creek	Riverine

1	Old Monbulk Road	Belgrave	Sherbrooke Creek	Riverine

Total
33

Table C8.3 – Properties at risk of flooding along the Monbulk Creek and Ferny Creek catchments in the Yarra Ranges

Isolation

No major isolation risks exist for areas in Belgrave, Tecoma & Upwey during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within the Yarra Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Belgrave, Tecoma & Upwey are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding along Monbulk & Ferny Creeks in Belgrave, Tecoma & Upwey. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event
• Belgrave-Hallam Road, Belgrave at Park Drive
• Lysterfield Road, Lysterfield at Monbulk Creek crossing
• Monbulk Road, Belgrave at Gully Crescent

Table C8.4 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads likely flooded in a 1% AEP (100yr ARI) event		
BELGRAVE	• Station Street	**UPPER FERNTREE GULLY**
• Apsley Road	**BELGRAVE HEIGHTS**	• Ferndale Road
• Bellbird Street	• Mt Morton Road	• New Road
• Judkins Avenue	**LYSTERFIELD**	**UPWEY**
• McNicol Road	• Nixon Road	• Kumbada Avenue
• Old Monbulk Road		• Mahony Street
• Park Drive		• Rutherford Road

Table C8.5 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses In Flow Path (sunny day)	Melway Reference
Ferny Creek, Upwey	Ferny Creek	130.0m AHD	130.0m AHD	Unavailable	7.0m 130.8m AHD	210 ML	High A	20	74 F8
Monbulk Creek, Lysterfield	Monbulk Creek	125.8m AHD	127.3m AHD	126.51m AHD	8.5m 127.8m AHD	822.0ML	Low	0	83J2

Table C8.6 – Melbourne Water Retarding Basins within the Monbulk Creek & Ferny Creek catchments in the Yarra Ranges

Weirs

Weir Name	On Drain / Waterway	Owner	Location	Melway Reference
Belgrave Lake	Monbulk Creek	Shire of Yarra Ranges	Belgrave Lake Park (Former Dandenong Reservoir)	84 F1

Table C8.7 – Weirs along Monbulk Creek in the Shire of Yarra Ranges

No formal Pumping Stations or Levees exist in Belgrave, Tecoma or Upwey.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around the Monbulk and Ferny Creeks and their stormwater tributaries is contained within the following table.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Old Monbulk Road	Sherbrook Creek	East	South East Water		75 G10

Table C8.8 – Sewer Pumping Stations along the Monbulk and Ferny Creeks and their stormwater tributaries in the Shire of Yarra Ranges

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Monbulk and Ferny Creeks at various creek heights or rain totals within the Shire of Yarra Ranges. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Monbulk Creek at Lysterfield
- Ferny Creek at Upwey

FLOOD INTELLIGENCE CARD – LYSTERFIELD GAUGE, MONBULK CREEK

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	**Monbulk Creek Retarding Basin, Nixon Road, Lysterfield**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/228229B**
STREAM:	**Monbulk Creek**
GAUGE NUMBER:	**228229B**
GAUGE ZERO:	**116.47m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**83 J2**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
EMBANKMENT HEIGHT:	**11.33m**
HIGHEST RECORDED FLOOD:	**8.56m (5th February 2011)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
7.17m	10% AEP (10yr ARI) Flood Level	**Properties at Flood Risk** **7 Properties in Total** • 53 & 65 Park Drive, Belgrave • 38 Bellbird Street, Belgrave • 1 & 5 Apsley Road, Belgrave • 4 Sunnyhill Road, Belgrave • 1 Old Monbulk Road, Belgrave **Community Infrastructure Flooded** • Puffing Billy Railway Branch Head Office on Old Monbulk Road, Belgrave • Belgrave Lake Park on Judkins Avenue, Belgrave **Essential Infrastructure Likely Impacted** • Bus Route 697 along Belgrave-Hallam Road, Belgrave • Bus Route 699 on Station Street, Belgrave **Water Over Road (above 300mm depth)** • Apsley Road, Belgrave • Belgrave-Hallam Road, Belgrave at Park Drive • Old Monbulk Road, Belgrave • Station Street, Belgrave	

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
8.56m	5th February 2011 Flood Level Peak	**Event Summary** • Station Street, Belgrave at McNicol Road flooded with significant levels with a car stuck in floodwater	
8.66m	5% AEP (20yr ARI) Flood Level	**Properties at Flood Risk** **4 New at Level; 11 Properties in Total** • 49, 50, 52 & 53 McNicol Road, Belgrave **Water Over Road (above 300mm depth)** • Judkins Avenue, Belgrave • Park Drive, Belgrave near Arbor Avenue • McNicol Road, Belgrave	
9.33m		• Spillway Starts Operating	
9.8m	2% AEP (50yr ARI) Flood Level	**Properties at Flood Risk** **1 New at Level; 12 Properties in Total** • 65-71 Monbulk Road, Belgrave **Essential Infrastructure Likely Impacted** • Bus Route 663 and 694 on Monbulk Road, Belgrave **Water Over Road (above 300mm depth)** • Monbulk Road, Belgrave at Sherbrooke Creek crossing	
10.0m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **3 New at Level; 15 Properties in Total** • 63 Monbulk Road, Belgrave • 371 Lysterfield Road, Lysterfield • 111 Belgrave-Hallam Road, Belgrave **Water Over Road (above 300mm depth)** • Bellbird Street, Belgrave at Broadway • Mt Morton Road, Belgrave Heights • Lysterfield Road, Lysterfield at Monbulk Creek crossing • Nixon Road, Lysterfield	
10.83 m		• Full Supply Level Reached	
11.33m		• Embankment Crest Height Reached	

Table C8.9 – Breakdown of likely consequences at various Lysterfield gauge level heights along Monbulk Creek with operational considerations

FLOOD INTELLIGENCE CARD – FERNY CREEK, UPWEY (UNGAUGED)

Version 4 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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CLOSEST RAIN GAUGE	**Lysterfield**
LOCATION	**Monbulk Creek Retarding Basin, Lysterfield**
RECENT RAIN:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/228229B**

MELWAY REF:	**83 J2**
GAUGE NUMBER	**228229B**
GAUGE TYPE	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
22mm in 10 mins; 35mm in 30 mins; 45mm in 1 hour; 58mm in 2 hours; 84mm in 6 hours; or 107mm in 12 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100-year ARI)	**Properties at Flood Risk** **18 Properties in Total** • 13, 15 & 22-24 Alexander Avenue, Upwey • 57 Glenern Avenue, Upwey • 1-5 & 9 Hillside Grove, Upwey • Units 3-4/4, 5, 7-9 & 16 Kumbada Avenue, Upwey • 11, 13 & 17 Langhford Court, Tecoma • 45, 62 & 64 Mahony Street, Upwey • 6 New Road, Upper Ferntree Gully **Water Over Road (above 300mm depth)** • Rutherford Road, Upwey • Kumbada Avenue, Upwey • Mahony Street, Upwey • New Road, Upwey at Ferny Creek Retarding Basin	

Table C8.10 – Breakdown of possible consequences at various rainfall intensities around Ferny Creek in Upwey with operational considerations

APPENDIX C9 – WOORI YALLOCK CREEK AND WANDIN YALLOCK CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Woori Yallock Creek and Wandin Yallock Creek are two separate waterways that flow north through the Yarra Ranges converging together just before they join the Yarra River in Woori Yallock.

The Wandin Yallock Creek begins in Silvan, flowing the townships of Wandin East, Seville and Gruyere. The tributary of Wild Cattle Creek joins Wandin Yallock Creek in Seville flowing from Wandin North. The most prominent consequences of Wandin Yallock Creek lay in Seville between where the creek crosses the Warburton Highway and Victoria Road. These roads along with local roads Britton Road, and Seymour Street are at risk of flooding as they were in December 2010 and February 2011. Properties in Seymour Street and nearby Station Road, Britton Road, Warburton Highway and Victoria Road are also at risk of flooding. A gauge at Candler Road in Gruyere exists to monitor stream levels.

The Woori Yallock Creek begins in Monbulk, flowing north through Macclesfield, Silvan and Yellingbo where the waterway is joined by Cockatoo Creek. Currently, only flood modelling exists downstream of Cockatoo creek and the Stream Level gauge at Parslows Road. Downstream of this location, only Old Warburton Highway is at risk of flooding from Woori Yallock Creek.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along the Woori Yallock Creek					
Property					
Properties	**0**				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Essential Infrastructure					
Tertiary Roads	1	Old Warburton Highway, Seville East			
Tourism / Recreation					
Recreation Facilities	2	Woori Yallock Creek picnic area on Warburton Hwy and Warburton Trail at Woori Yallock			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	2	Lilydale and Upper Yarra	FRV District	0	

Table C9.1 – Consequence Summary of 1% AEP flood within the Woori Yallock Creek catchment

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along the Wandin Yallock Creek					
Property					
Properties	**20**				
Residential	13				
Commercial	4	Warburton Highway, Seville			
Industrial	0				
Public Land	0				
Rural	3				
Community Infrastructure					
Essential Infrastructure					
Major Roads	1	Warburton Highway			
Bus Routes	2	683 and 965			
Sewerage Facilities	4	3 Pumping Stations and 1 Emergency Relief Point			
Tourism / Recreation					
Recreation Facilities	1	Warburton Trail			
Government Boundaries					
Local Gov't Areas	1	Shire of Yarra Ranges	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 13
SES Unit Area	1	Lilydale	FRV District	0	

Table C9.2 – Consequence Summary of 1% AEP flood within the Wandin Yallock Creek catchment

Gauges and Warnings

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for the Woori Yallock or Wandin Yallock Creeks. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located at Seville East, Woori Yallock, Yellingbo, Monbulk & Nangana.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Snow Gauge	Map book Reference
Beenak	586195	10 Beenak Road, Beenak		✓		VicMap 6618 G15
Shepherd Creek at Nangana	229677B	South bank of the creek, east side of the Woori Yallock Road bridge	✓			308 F11
Cockatoo Creek at Nangana	229248B	West bank of the creek, south side of Kiernan Road bridge	✓			310 E1
Wandin Yallock Creek at Seville East	229681B	North side of the creek at the end of Chandler Road	✓			Melway 285 C5
Woori Yallock at Woori Yallock	229215B	East side of the creek at the Warburton Trail crossing	✓	✓		Melway 286 A7
Woori Yallock at Yellingbo	229679B	East side of the Parslows Road bridge	✓			Melway 306 A8
Woori Yallock Creek at Monbulk	229694B	South side of the creek, cnr Emerald – Monbulk Rd and Old Emerald Rd	✓			Melway 125 E6

Table C9.3 – Hydrographic Monitoring Stations within the Woori Yallock Creek and Wandin Yallock Creek catchments

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The Bureau of Meteorology's website also links a number of these gauges at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk around the Woori Yallock and Wandin Yallock Creeks

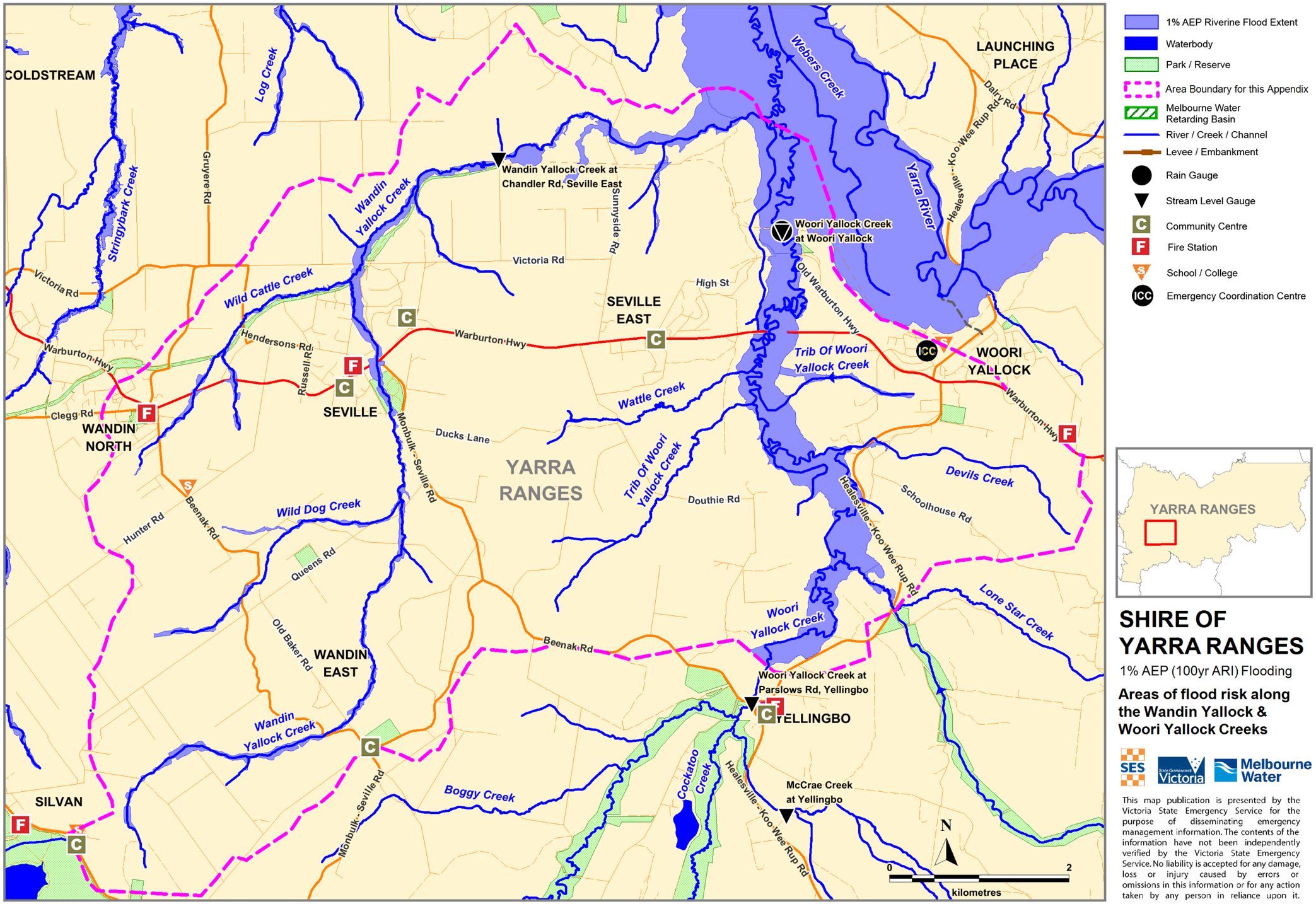


Figure C9 – Areas of flood risk around the Woori Yallock Creek and Wandin Yallock Creek in the Yarra Ranges

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Wandin Yallock Creek. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Wandin Yallock Creek (Melbourne Water, May 2013) flood mapping and risk assessment program.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
652	Warburton Highway	Seville	Wandin Yallock Creek	Riverine
658	Warburton Highway	Seville	Wandin Yallock Creek	Riverine
662	Warburton Highway	Seville	Wandin Yallock Creek	Riverine
668-670	Warburton Highway	Seville	Wandin Yallock Creek	Riverine
23	Britton Road	Seville	Wandin Yallock Creek	Riverine
37	Seymour Street	Seville	Wandin Yallock Creek	Riverine
1/39	Seymour Street	Seville	Wandin Yallock Creek	Riverine
2/39	Seymour Street	Seville	Wandin Yallock Creek	Riverine
40	Seymour Street	Seville	Wandin Yallock Creek	Riverine
42	Seymour Street	Seville	Wandin Yallock Creek	Riverine
44	Seymour Street	Seville	Wandin Yallock Creek	Riverine
46	Seymour Street	Seville	Wandin Yallock Creek	Riverine
46A	Seymour Street	Seville	Wandin Yallock Creek	Riverine
48	Seymour Street	Seville	Wandin Yallock Creek	Riverine
35	Station Road	Seville	Wandin Yallock Creek	Riverine
38	Station Road	Seville	Wandin Yallock Creek	Riverine
45	Station Road	Seville	Wandin Yallock Creek	Riverine
435	Victoria Road	Gruyere	Wandin Yallock Creek	Riverine
441	Victoria Road	Gruyere	Wandin Yallock Creek	Riverine
210	Killara Road	Gruyere	Wandin Yallock Creek	Riverine

Total
20

Table C9.4 – Properties at risk of flooding along the Woori Yallock Creek and Wandin Yallock Creek catchments in the Yarra Ranges

Isolation

No major isolation risks exist for areas around Wandin North, Wandin East, Seville, Seville East, Woori Yallock & Yellingbo during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within the Yarra

Ranges is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/2e202631c6/54_Yarra_Ranges_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Wandin North, Wandin East, Seville, Seville East, Woori Yallock & Yellingbo are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Wandin North, Wandin East, Seville, Seville East, Woori Yallock & Yellingbo. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads flooded in a 1% AEP (100yr ARI) event
• Warburton Highway, Seville west of the Monbulk-Seville Road roundabout

Table C9.5 – VicRoads Possible Road Closures during a flooding event

Yarra Ranges Council Roads flooded in a 1% AEP (100yr ARI) event	
GRUYERE	**SEVILLE EAST**
• Killara Road	• Kylie Lane
SEVILLE	• Old Warburton Highway
• Beenak Road	**WANDIN EAST**
• Queens Road	• Graham Road
• Britton Road	
• Drummond Road	
• Seymour Street	
• Victoria Road	

Table C9.6 – Yarra Ranges Council Possible Road Closures during a flooding event

Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees exist around Wandin North, Wandin East, Seville, Seville East, Woori Yallock & Yellingbo.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around the Woori Yallock and Wandin Yallock Creeks is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Elvian Road	Woori Yallock Creek Tributary	-	Yarra Valley Water	Elvian Road, Woori Yallock	286 D11
Old Warburton Hwy	Woori Yallock Creek	West	Yarra Valley Water	Warburton Highway, Seville East at Woori Yallock Creek	286 A11
Victoria Road	Wandin Yallock Creek	East	Yarra Valley Water	Station Road, Seville	119 J8

Table C9.7 – Sewer Pumping Stations within the Woori Yallock and Wandin Yallock Creek Catchments

Sewer Emergency Relief Points

There is a Sewer Emergency Relief Point along one of Woori Yallock Creek's tributaries in Woori Yallock that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Woori Yallock Creek Tributary	-	Yarra Valley Water	Elvian Road, Woori Yallock	286 D11

Table C9.8 – Sewer Emergency Relief Points in the Woori Yallock Creek Catchment

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Management Plan (SEMP). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Woori Yallock and Wandin Yallock Creeks at various creek heights. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Wandin Yallock Creek at Seville East
- Woori Yallock Creek at Woori Yallock

FLOOD INTELLIGENCE CARD – SEVILLE EAST GAUGE, WANDIN YALLOCK CREEK

Version 2 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. ***Scan the QR code for the current levels for this gauge.***

LOCATION:	**North side of the creek at the end of Chandler Road, Gruyere**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229681B**
STREAM:	**Wandin Yallock Creek**
GAUGE NUMBER:	**229681B**
GAUGE ZERO:	**103.07m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**285 C5**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**3.49m (5th February 2011)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.83m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **20 Properties in Total** • 652, 658, 662 & 668-670 Warburton Highway, Seville • 23 Britton Road, Seville • 37, Units 1-2/39, 40, 42, 44, 46, 46A & 48 Seymour Street, Seville • 35, 38 & 45 Station Road, Seville • 435 & 441 Victoria Road, Gruyere • 210 Killara Road, Gruyere **Community Infrastructure Likely Flooded** • Warburton Trail at Station Road, Seville and at Kylie Lane, Seville East **Essential Infrastructure Likely Impacted** • Bus Routes 683 and 965 on Warburton Highway in Seville **Water Over Road** • Killara Road, Gruyere • Beenak Road, Seville • Queens Road, Seville • Warburton Highway, Seville west of the Monbulk-Seville Road roundabout • Britton Road, Seville	

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Drummond Road, Seville • Seymour Street, Seville • Victoria Road, Seville • Kylie Lane, Seville East • Graham Road, Wandin East	

Table C9.9 – Breakdown of likely consequences at various Seville East gauge level heights along the Wandin Yallock Creek with operational considerations

FLOOD INTELLIGENCE CARD – WOORI YALLOCK GAUGE, WOORI YALLOCK CREEK

Version 2 – September 2020

Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. ***Scan the QR code for the current levels for this gauge.***

LOCATION:	**East side of the creek at the Warburton Trail crossing, Woori Yallock**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229215B**
STREAM:	**Woori Yallock Creek**
GAUGE NUMBER:	**229215B**
GAUGE ZERO:	**83.16m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**286 A7**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**3.37m (5th February 2011)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.37m	1% AEP (100yr ARI) Flood Level 5th February 2011 Flood Level	**Community Infrastructure Likely Flooded** • Warburton Trail at Woori Yallock Creek crossing, Woori Yallock • Woori Yallock Creek picnic area on Warburton Hwy, Woori Yallock **Water Over Road** • Old Warburton Highway, Seville East	

Table C9.10 – Breakdown of likely consequences at various Woori Yallock gauge level heights along the Woori Yallock Creek with operational considerations

APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

Phase 1 - Decision to Evacuate

The IC may make the decision to evacuate an at-risk community under the following circumstances:

- Properties are likely to become inundated;
- Properties are likely to become isolated and occupants are not suitable for isolated conditions;
- Public health is at threat as a consequence of flooding and evacuation is considered the most effective risk treatment. This is the role of the Health Commander of the incident to assess and manage. Refer to the State Health Emergency Response Plan (SHERP) for details);
- Essential services have been damaged and are not available to a community and evacuation is considered the most effective risk treatment.

The following should be considered when planning for evacuation:

- Anticipated flood consequences and their timing and reliability of predictions;
- Size and location of the community to be evacuated;
- Likely duration of evacuation;
- Forecast weather;
- Flood Models;
- Predicted timing of flood consequences;
- Time required to conduct the evacuation;
- Time available to conduct the evacuation;
- Evacuation priorities and evacuation planning arrangements;
- Access and egress routes available and their potential flood liability;
- Current and likely future status of essential infrastructure;
- Resources required to conduct the evacuation;
- Resources available to conduct the evacuation;
- Shelter including Emergency Relief Centres, Assembly Areas etc.;
- Vulnerable people and facilities;
- Transportation;
- Registration
- People of CALD background and transient populations;
- Safety of emergency service personnel; and
- Different stages of an evacuation process.

The decision to evacuate is to be made by the IC in consultation with the MERO, MERC, MRM, DHHS, Health Commander and other key agencies and expert advice (CMA's and Flood Intelligence specialists).

Triggers for evacuation, e.g. specific flood heights are predicted or are likely to occur will be considered when planning evacuation.

Phase 2 – Warning

Warnings may include a warning to prepare to evacuate and a warning to evacuate immediately. Once the decision to evacuate has been made, the at-risk community will be warned to evacuate. Evacuation warnings can be disseminated via methods listed in Part 3 of this Plan.

Evacuation warning messages will be developed and issued by VICSES in consultation with the MERO, MERC, DHS and other key agencies and expert advice (CMA's and Flood Intelligence specialists).

Phase 3 – Withdrawal

Withdrawal will be controlled by VICPOL. All agencies will provide advice regarding most appropriate evacuation routes and locations for at-risk communities to evacuate to.

VICSES, CFA, AV and Local Government will provide resources where available to support VICPOL/VICROADS with route control and may assist VICPOL in arranging evacuation transportation.

VICPOL will control security of evacuated areas.

Evacuees will be encouraged to move using their own transport where possible. Transport for those without vehicles, or other means will be arranged at the request of the incident controller or via the appointed VicPol evacuation manager.

Landing zones for aircraft will be determined by the following:

- The IC will determine the requirements for airborne resources
- The State Aircraft Desk will deploy and coordinate air resources
- The pilot in command will determine the safest location to land.

Landing zones for helicopters are located at:

- Wesburn Park, 2804 Warburton Hwy, Wesburn
- Don Rd Sporting Complex 249-263 Don Rd, Healesville

Vulnerable People in Emergencies

Vulnerable people living in the community will be identified through funded agencies, community service organisations or other community networks. Such people will be assessed against the definition of a vulnerable person and may qualify for registration on the Vulnerable Persons Register (VPR). A list of facilities where vulnerable people may be located, is also kept by Council. These may be funded facilities including, education, health and childcare, commonwealth regulated aged care facilities and other locally identified facilities. Further information on Vulnerable People in Emergencies can be obtained from Councils Emergency Management Co-ordinator.

Phase 4 – Shelter

Relief Centres and/or assembly areas which cater for people's basic needs for storms/floods may be established to meet the immediate needs of people affected by storm and/or flooding.

The emergency relief centres and/or Assembly Areas are listed in the MEMP.

VICPOL will liaise with Local Government and DHS (where regional coordination is required) via the relevant control centre to plan for the opening and operation of relief centres. This can best be achieved through the IEMT.

Animal Shelter

Animal shelter compounds will be established for domestic pets and companion animals of evacuees. These facilities may be located at locations detailed in the MEMPlan.

Caravans

Caravans maybe evacuated. Caravan evacuation will be determined dependent on location and size of event.

Phase 5 – Return

Return will be consistent with the Strategic Plan for the Return of Community

The IC in consultation with VICPOL will determine when it is safe for evacuees to return to their properties and will arrange for the notification of the community.

VicPol will manage the return of evacuated people with the assistance of other agencies as required.

Considerations for deciding whether to evacuate include:

- Current flood situation;
- Status of flood mitigation systems;
- Size and location of the community;
- Access and egress routes available and their status;
- Resources required to coordinate the return;
- Special needs groups;
- Forecast weather; and
- Transportation particularly for people without access to transport

Disruption to Services

Disruption to a range of services can occur in the event of a storm and/or flood. This may include road closures affecting school bus routes and, water treatment plant affecting potable water supplies etc.

This table will be populated as a more detailed analysis of the flood risk is completed.

Service	Impact	Trigger Point for Action	Strategy / Temporary Measures

Essential Infrastructure and Property Protection

Essential Infrastructure and properties (e.g. residences, businesses, roads, power supply etc.) that require protection are:

This table will be populated as a more detailed analysis of the flood risk is completed.

Facility	Impact	Trigger Point for Action	Strategy / Temporary Measures

For small scale events sandbags can be purchased from Bunning's. For larger scale events sandbag collection points and filling points will be determined, with the community being informed of these points depending on the nature and proximity of the event.

Rescue

The following resources are available within the Yarra Ranges Municipality to assist with rescue operations:

Aircraft available through state aircraft unit. Boats available through VICSES RDO. VICPOL resources available via RERC.

Known high-risk areas/communities (i.e. low-lying islands) where rescues might be required are detailed in **Appendix F** flood maps.

There are no identified communities at risk. The risk base is individual properties in low lying areas.

APPENDIX E – STORM AND FLOOD WARNING SYSTEMS

Storm and Flood Warning

Storm and Flood Warning products and Flood Class Levels can be found on the BoM website. Storm and Flood Warning Products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings.

Flood Bulletins

VICSES distributes flood emergency information to the media through “Flood Bulletins”. Flood Bulletins provide BoM Flood Warning information as well as information regarding possible flood consequences and safety advice, not contained in BoM Flood Warning products. VICSES uses the title Flood bulletin to ensure emphasis is placed upon BoM Flood Warning product titles.

The relevant VICSES Region Headquarters or the established ICC will normally be responsible for drafting, authorizing and issuing issue Flood Bulletins, using the One Source, One Message system.

Flood Bulletins should refer to the warning title within the Bulletin header, for example Flood Bulletin for Major Flood Warning on Yarra River (see page 70 for example).

Flood Bulletins should follow the following structure

- What is the current flood situation;
- What is the predicted flood situation;
- What are the likely flood consequences;
- What should the community do in response to flood warnings;
- Where to seek further information; and
- Who to call if emergency assistance is required.

It is important that the description of the predicted flood situation is consistent with and reflects the relevant BoM Flood Warning.

Flood Bulletins should be focused on specific gauge (or in the absence of gauges, catchment) reference areas, that is the area in which flood consequences specifically relate to the relevant flood gauge.

Flood Bulletins should be prepared and issued after receipt of each Flood Watch and Flood Warning from the BoM, or after Severe Weather or Thunderstorm Warnings indicating potential for severe flash flooding.

To ensure flood bulletins are released in a timely manner, standardised flood bulletins may be drafted based on different scenarios, prior to events occurring. The standardised flood bulletins can then be adapted to the specifics of the event occurring or predicted to occur.

Local Flood Warning System Arrangements

No local arrangements in place.

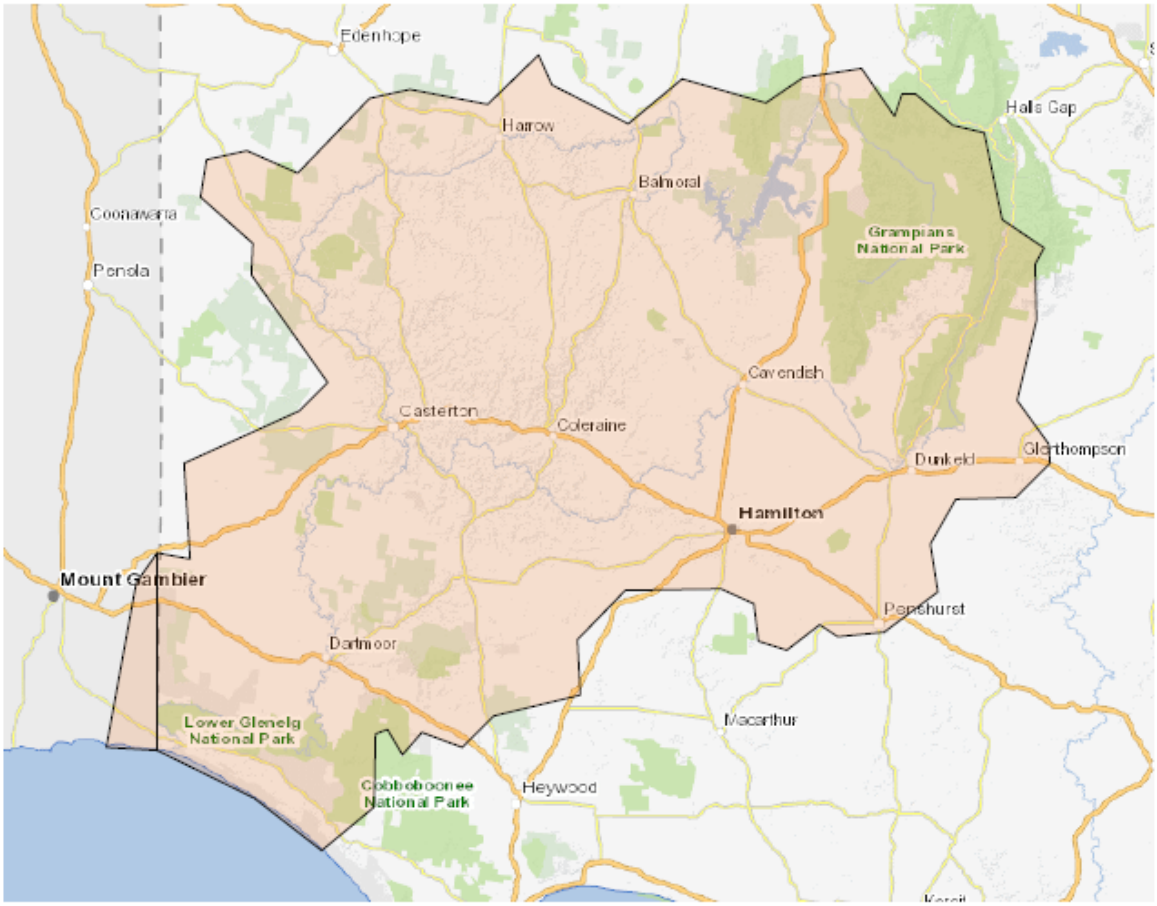
Moderate Flood Warning Example

Community Notification Sign-off

WARNING - FLOOD

Incident Location:	Glenelg River at Casterton
Incident Name:	GlenelgRiverFloodSept2017
Issued:	Set at publish time
Next Update Expected:	

Map



Message

This **Moderate Flood Warning** is being issued for Glenelg River at Casterton.

- In the 24hrs to 9am Friday up to 50mm of rainfall was recorded in the Glenelg River catchment.
- A further 5mm to 10mm is forecast for the remainder of Friday.
- Glenelg River: Moderate flooding is likely along the Glenelg River.
- The Glenelg River at Dergholm is above the minor flood level (4.0 m) and rising.
- The Glenelg River at Casterton is currently at 4.50 metres (minor flood level 3.8 m) and rising.
- The Glenelg River at Casterton is likely to exceed the moderate flood level (5.20 m) during Friday.

Act now - take actions immediately to protect your life and property.

What you should do:
Decide if you will evacuate if it becomes necessary.

If you choose to leave:
- Remember to take your pets, mobile phone, spare clothes and medications.
- Travel to the home of family or friends who are in a safe location, away from flooding.
- Be aware of any road closures when you leave.

If you are travelling:
- Be aware of road hazards including mud, debris and damaged roads or bridges.
- Floodwater is dangerous - never drive, walk or ride through floodwater.

If you stay or if it is unsafe to leave:
- Make sure you have enough food, drinking water, medications and pet food to survive for 3-5 days in case you become isolated.

You should stay informed by listening to emergency broadcasters and monitoring warnings.

Impacts in your area:
- Flooding above floor level of a single story home is likely to occur in some locations.

This message was issued by State Emergency Service.

The next update is expected by [warning_next_update] **or as the situation changes.**

Flood information:
- For river heights check www.bom.gov.au (http://www.bom.gov.au/vic/flood/rain_river.shtml) or phone 1300 659 217.
- For urgent animal welfare issues call Agriculture Victoria (http://agriculture.vic.gov.au/agriculture/emergencies) on 136 186 or your local vet.

Emergency contacts:
- For life threatening emergencies call Triple Zero (000).
- For flood and storm emergency assistance (http://www.ses.vic.gov.au/about/ShouldIcalltheSES.pdf) from the SES call 132 500.

Stay informed:
- Via www.emergency.vic.gov.au (http://emergency.vic.gov.au/respond/).
- Tune in to ABC Local Radio, commercial and designated community radio stations, or Sky News TV.
- Call the VicEmergency Hotline (https://vicemergency.zendesk.com/hc/en-gb/articles/115001055007-What-is-the-VicEmergency-Hotline-) to talk to someone about this warning on freecall 1800 226 226.
- People who are deaf, hard of hearing, or who have a speech/communication impairment can contact VicEmergency Hotline via the National Relay Service (http://relayservice.gov.au/) on 1800 555 677.

- For help with English, call the Translating and Interpreting Service (https://www.tisnational.gov.au/) on 131 450 (freecall) and ask them to telephone VicEmergency Hotline. If you know someone who cannot speak English, provide them with this number.
- Download the VicEmergency app (https://vicemergency.zendesk.com/hc/en-gb/articles/230492607-What-is-the-VicEmergency-app-) or follow VicEmergency on Twitter (https://twitter.com/vicemergency) (#vicfloods) or Facebook (https://www.facebook.com/vicemergency).

Facebook

WARNING - FLOOD
Incident Location: Glenelg River at Casterton
Incident Name: GlenelgRiverFloodSept2017
Issue Date:
Next Update:

This Moderate Flood Warning is being issued for Glenelg River at Casterton.

- In the 24hrs to 9am Friday up to 50mm of rainfall was recorded in the Glenelg River catchment.
- A further 5mm to 10mm is forecast for the remainder of Friday.
- Glenelg River: Moderate flooding is likely along the Glenelg River.
- The Glenelg River at Dergholm is above the minor flood level (4.0 m) and rising.
- The Glenelg River at Casterton is currently at 4.50 metres (minor flood level 3.8 m) and rising.
- The Glenelg River at Casterton is likely to exceed the moderate flood level (5.20 m) during Friday.

Act now - take actions immediately to protect your life and property.

More details at http://emergency.vic.gov.au/respond/#!/warning/3941/moreinfo

Twitter

Moderate Flood Warning for Glenelg River at Casterton. For more info: http://bit.ly/2tfmm6t #vicfloods

Sign-off

Authorised By:

Authorised Signature:

APPENDIX F – MAPS AND SCHEMATICS

Overview

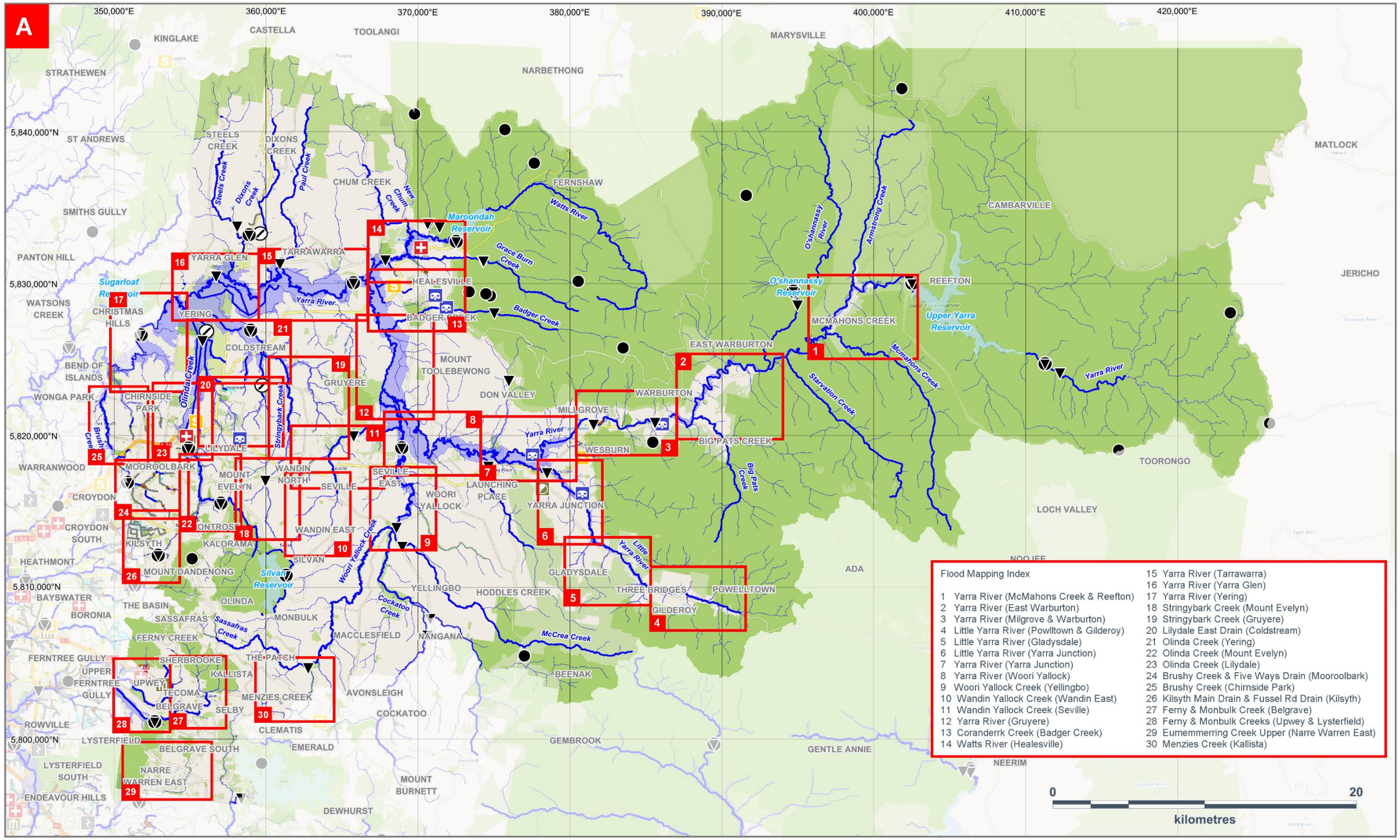
Maps considered useful to flood response are included in this Appendix. They include:

- A map outlining a series of flooding hot spot maps within the Shire of Yarra Ranges.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within the Shire of Yarra Ranges and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 30 maps showing flooding hot spots within the Shire of Yarra Ranges together with the 1% AEP (100-year ARI) flood extents (sourced from the Melbourne Water GIS).
- Schematics detailing the drainage catchments relevant for this municipality.
    - Each Schematic outlines the drainage system comprising of rivers, creeks or storm-water drains contained within one of the major catchments in the Port Phillip & Westernport Region.
    - Within each Schematic, there are details useful to flood response such as those relating to gauges, towns, rivers, creeks, drains and reservoirs. Historical facts and figures may also be shown.
    - The schematics also detail the response boundaries for SES Units and local government, and provide a reference link to the corresponding Municipal Flood Emergency Plan.
    - Details within these Catchment Schematics reflect those contained within either other sections of this Municipal Flood Emergency Plan or refer to other Municipal Flood Emergency Plans. These details have been filtered to contain only key facts. For more information on a gauge, drainage system or town consult the corresponding Flood Emergency Plan

Note that:

- The mapping/data provided in this Appendix has been developed from Melbourne Water and other sources and taken from historical records and flood modelling. It may not include more recent data or local anecdotal information. It is planned that the mapping/data be updated as further studies or modelling is completed and other Information obtained.
- Maps showing the Special Building Overlay and Land Subject to Inundation Overlay are included in the Yarra Ranges Planning Scheme can be used as a guide to areas that may flood during an event. The maps can be found in hard copy form at the Council's main office or online at the Department of Environment, Land, Water & Planning (DELWP) website https://mapshare.vic.gov.au/vicplan/.
- Maps showing 1 in 100-year ARI (1% AEP) flood extents and floodways (together with volume, height and water quality data) are shown at DELWP's mapshare website http://mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&locale=en-AU
- Note that not all waterways or drains are included in the schematics, only those that are likely to contribute to flooding further on along the drainage system. Note also the flow direction; the schematics either flow from the top of the page to the bottom, or vice versa.

Shire of Yarra Ranges Municipal Maps (sourced Melbourne Water GIS)



Flood Mapping Index	
1	Yarra River (McMahons Creek & Reefton)
2	Yarra River (East Warburton)
3	Yarra River (Milgrove & Warburton)
4	Little Yarra River (Powlltown & Gilderoy)
5	Little Yarra River (Gladysdale)
6	Little Yarra River (Yarra Junction)
7	Yarra River (Yarra Junction)
8	Yarra River (Woori Yallock)
9	Woori Yallock Creek (Yellingbo)
10	Wandin Yallock Creek (Wandin East)
11	Wandin Yallock Creek (Seville)
12	Yarra River (Gruyere)
13	Coranderrk Creek (Badger Creek)
14	Watts River (Healesville)
15	Yarra River (Tarrawarra)
16	Yarra River (Yarra Glen)
17	Yarra River (Yering)
18	Stringybark Creek (Mount Evelyn)
19	Stringybark Creek (Gruyere)
20	Lilydale East Drain (Coldstream)
21	Olinda Creek (Yering)
22	Olinda Creek (Mount Evelyn)
23	Olinda Creek (Lilydale)
24	Brushy Creek & Five Ways Drain (Mooroolbark)
25	Brushy Creek (Chirnside Park)
26	Kilsyth Main Drain & Fussel Rd Drain (Kilsyth)
27	Ferny & Monbulk Creek (Belgrave)
28	Ferny & Monbulk Creeks (Upwey & Lysterfield)
29	Eumemmerring Creek Upper (Narre Warren East)
30	Menzies Creek (Kallista)

Map Produced by VICSES August 2020.

Basemap © OpenStreetMap contributors

N

YARRA RANGES SHIRE

Version 4: August 2020

A. Flood Mapping Index

- Vegetation
- Waterbody
- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent
- Melbourne Water Stormwater Drain
- Waterway
- Flood Map Border
- Stream Level Gauge
- Rain Gauge
- Power Terminal Station
- Municipal Offices
- Municipal Depot
- Hosptial
- Caravan Park
- State Emergency Service
- Airfield

B

350,000°E 360,000°E 370,000°E 380,000°E 390,000°E 400,000°E 410,000°E 420,000°E

5,840,000°N 5,830,000°N 5,820,000°N 5,810,000°N 5,800,000°N

KINGLAKE CASTELLA TOOLANGI MARYSVILLE NARBETHONG STRATHEWEN ST ANDREWS STEELS CREEK DIXONS CREEK CHUM CREEK FERNSHAW MATLOCK SMITHS GULLY CAMBARVILLE PANTON HILL YARRA GLEN TARRAWARRA HEALESVILLE JERICHO WATSONS CREEK CHRISTMAS HILLS YERING REEFTON BADGER CREEK MCMAHONS CREEK EAST WARBURTON COLDSTREAM BEND OF ISLANDS MOUNT TOOLEBEWONG GRUYERE DON VALLEY WARBURTON WONGA PARK CHIRNSIDE PARK MILLGROVE BIG PATS CREEK LILYDALE WESBURN TOORONGO WARRANWOOD MOOROOLBARK MOUNT EVELYN WANDIN NORTH SEVILLE SEVILLE EAST WOORI YALLOCK LAUNCHING PLACE YARRA JUNCTION LOCH VALLEY CROYDON CROYDON SOUTH MONTROSE WANDIN EAST KILSYTH KALORAMA SILVAN NOOJEE HEATHMONT MOUNT DANDENONG GLADYSDALE ADA BAYSWATER BORONIA THE BASIN OLINDA YELLINGBO HODDLES CREEK THREE BRIDGES POWELLTOWN GILDEROY SASSAFRAS MONBULK MACCLESFIELD NANGANA FERNY CREEK SHERBROOKE THE PATCH PIEDMONT FERNTREE GULLY UPPER FERNTREE GULLY KALLISTA BEENAK UPWEY TECOMA MENZIES CREEK AVONSLEIGH NAYOOK NEERIM JUNCTION BELGRAVE SELBY COCKATOO ROWVILLE CLEMATIS LYSTERFIELD EMERALD GEMBROOK GENTLE ANNIE BELGRAVE SOUTH LYSTERFIELD SOUTH NARRE WARREN EAST NEERIM ENDEAVOUR HILLS MOUNT BURNETT DEWHURST

Maroondah Reservoir
Sugarloaf Reservoir
O'shannassy Reservoir
Upper Yarra Reservoir
Silvan Reservoir

Steels Creek
Dixons Creek
Paul Creek
New Chum Creek
Watts River
Grace Burn Creek
Badger Creek
Yarra River
O'shannassy River
Armstrong Creek
Olinda Creek
Stringybark Creek
Brushy Creek
Starvation Creek
Mcmahons Creek
Big Pats Creek
Little Yarra River
Woori Yallock Creek
Cockatoo Creek
Sassafras Creek
McCrea Creek

Flood Study Details:

(a). Badger Creek Lower (Melbourne Water, March 2010)
(b). Brushy Creek Upper (Maroondah Flood Mapping, Engeny, February 2019)
(c). Bungalook Creek (Maroondah Flood Mapping, Engeny, February 2019)
(d). Chirnside Park Main Drain (Melbourne Water, April 2014)
(e). Don River (Melbourne Water, June 2016)
(f). Ferny Creek (Ferny Creek, GHD, February 2012)
(g). Five Ways Drain (Five Ways Drain Flood Protection, URS, November 2003)
(h). Kilsyth Main Drain (Kilsyth, BTM WBM, June 2013)
(i). Lilydale East Drain (Lilydale East Drain, Melbourne Water, May 2015)
(j). Little Yarra River (Little Yarra River Mapping, S P Goh, July 2013)
(k). Log Creek (Melbourne Water, June 2016)
(l). Menzies Creek (Menzies Creek, Melbourne Water, October 2014)
(m). Monbulk Creek (Melbourne Water, November 2013)
(n). Olinda Creek (Olinda Creek Flood Mapping, S P Goh, February 2017)
(o). Olinda Creek Tributaries (Olinda Creek, AECOM, June 2013)
(p). Stringy Bark Creek (Melbourne Water, June 2016)
(q). Wandin Yallock Creek (Melbourne Water, May 2013)
(r). Woori Yallock Creek (Melbourne Water, November 2007)
(s). Yarra river (Yarra River Flood Mapping, S P Goh, November 2010)

0 20
kilometres

Map Produced by VICSES August 2020.

N

YARRA RANGES SHIRE

Version 4: August 2020

B. 1% AEP (100yr ARI) Flood Mapping

- Vegetation
- Waterbody
- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent
- Melbourne Water Stormwater Drain
- Waterway
- Stream Level Gauge
- Rain Gauge
- Power Terminal Station
- Municipal Offices
- Municipal Depot
- Police Station
- Ambulance Station
- Hosptial
- Caravan Park
- Fire Station
- State Emergency Service
- Airfield

MELBOURNE

Basemap © OpenStreetMap contributors

SES VICTORIA Melbourne Water

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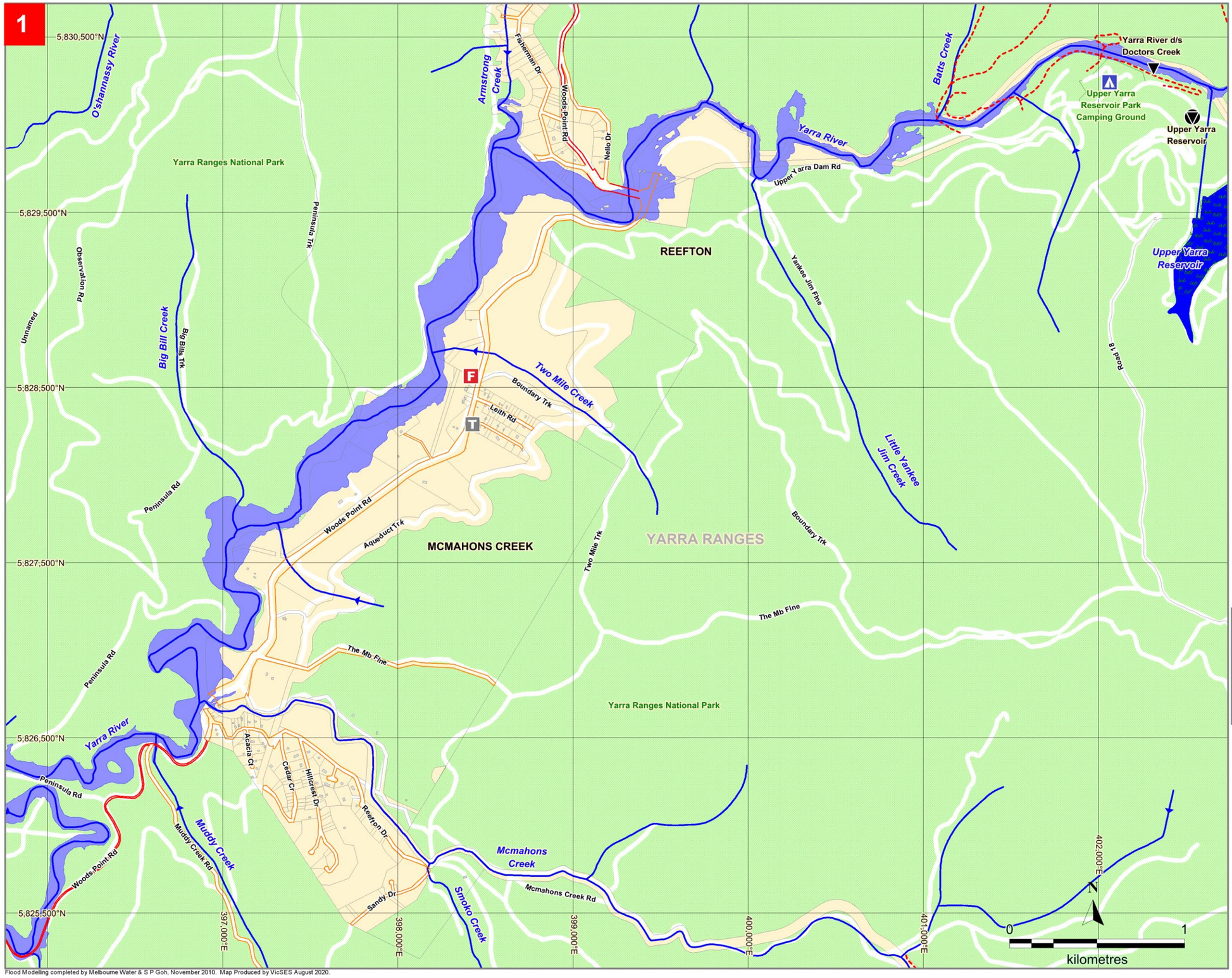
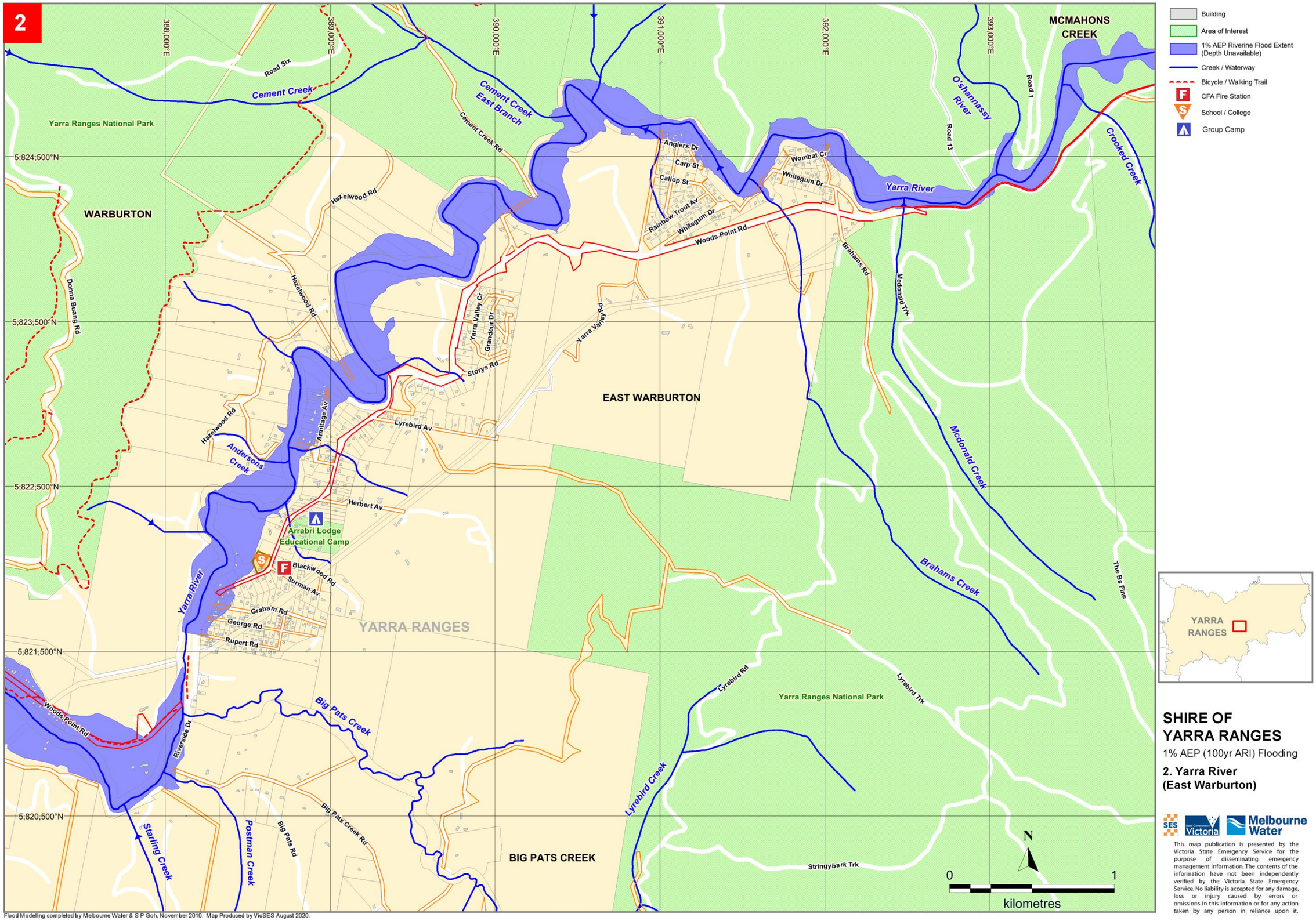
Flood Extent Maps (sourced Melbourne Water GIS)



Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.



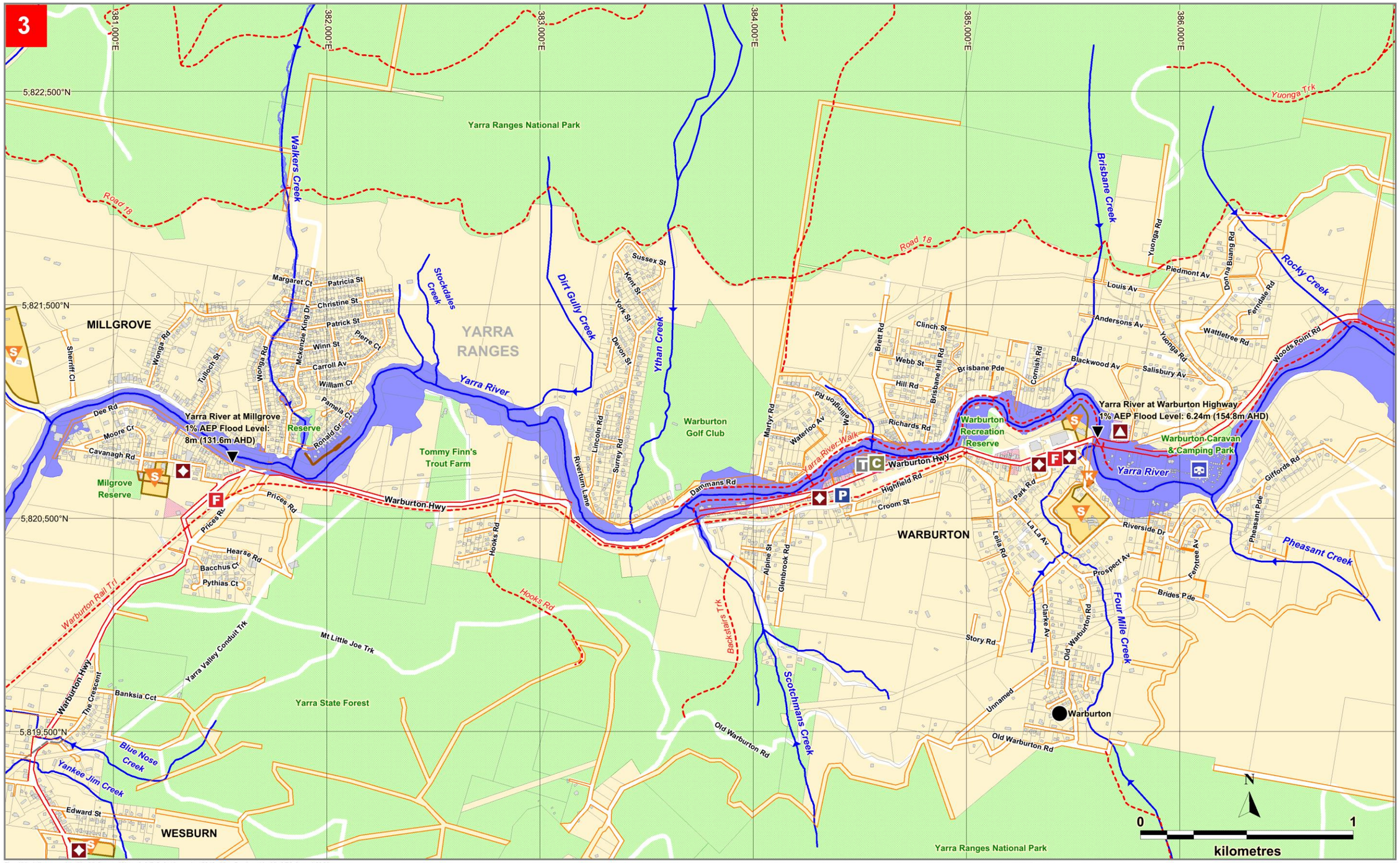
SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

2. Yarra River (East Warburton)

Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

3



Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

3. Yarra River (Milgrove & Warburton)

- Building
- Area of Interest
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Shopping Centre
- Creek / Channel
- Levee / Embankment
- Bicycle / Walking Trail
- School / College
- Kindergarten / Childcare
- Police Station
- CFA Fire Station
- Nursing Home / Aged Care
- Place Of Worship
- Community Centre
- Telephone Exchange
- Caravan Park
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge

4

386,000°E
387,000°E
388,000°E
389,000°E
390,000°E
391,000°E
5,810,500°N
5,809,500°N
5,808,500°N
5,807,500°N

THREE BRIDGES
GILDEROY
YARRA RANGES
POWELLTOWN
Yarra Ranges National Park
Bunyip State Park
Powelltown Recreation Reserve

Blacksands Rd
Mcconachys Rd
Yarra Junction - Noojee Rd
Willandara Rd
Gilderoy Rd
Torbetts Rd
Cockshuts Trk
Muratore Ct
Eucalyptus Dr
Recreation Rd
Yarra St
Blake St
Surrey Rd
Monett Rd
Boys Camp Fire
Big Bertha Trk
Learmonth Creek Rd
Wonley Trk

Little Yarra River
Blackwood Creek
Saxton Creek
Lake Muratore
Beer Creek
Learmonth Creek
Blake Creek
Boys Camp Creek
Moon Gully Creek

F Fire Station
C Community Centre
T Telephone Exchange

N
0
1
kilometres

Flood Modelling completed by Melbourne Water & S P Goh, July 2013. Map Produced by VicSES August 2020.

Building
Area of Interest
1% AEP Flood Depth
Greater than 0.6m
0.3m to 0.6m
Up to 0.3m
Natural Wetland
Waterbody
Creek / Channel
Bicycle / Walking Trail

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

4. Little Yarra River (Powelltown & Gilderoy)

Flood Modelling completed by Melbourne Water & S P Goh, July 2013. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

5. Little Yarra River (Gladysdale)

6

Little Yarra River at Yarra Junction
1% AEP Flood Level: 2.52m (116.2m AHD)

379,000°E
380,000°E
381,000°E
382,000°E
5,817,500°N
5,816,500°N
5,815,500°N
5,814,500°N
5,813,500°N

Settlement Rd
Benwerren Dr
Government Rd
Warburton Hwy
WESBURN
Upper Yarra Cemetery - Wesburn
Yarra State Forest
Reid St
Greenridge Ct
Britannia Creek Rd
Mineshaft Hill Trk
Tarrango Rd
Bleaches Lane
Coleman St
Douglas Donald Recreation Centre
Madeley Dr
Unnamed
Edwardstown Rd
Forest Rd
Mcowan Cr
Outlook Av
YARRA JUNCTION
Douglas Pde
Valley View Ct
Hillview St
Nature Park Rise
Little Yarra Rd
Bannerman St
Riversdale Rd
Britannia Creek
Old Tarrango Rd
Charles Pde
Little Yarra River
Yarra Junction M.D.
Henry St
Britannia Ridge Caravan Park
Bundaleer Rd
Yarra Ranges National Park
Miners Rd
Summerhill Rd
The Barrier Creek
Hearse Creek
YARRA RANGES
Rayner Ct
Stephensons Lane
Yarra Junction - Noojee Rd
Galdysdale Recreation Reserve (Ernest Lloyd Reserve)
Pettitt Rd
LAUNCHING PLACE
Parkinsons Rd
GLADYSDALE
Condon Creek

N
0
1
kilometres

Flood Modelling completed by Melbourne Water & S P Goh, July 2013. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

6. Little Yarra River (Yarra Junction)

- Building
- Area of Interest
- Shopping Precinct
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland

1% AEP Flood Depth

- Greater than 0.6m
- 0.3m to 0.6m
- Up to 0.3m

- Creek / Channel
- Bicycle / Walking Trail
- School / College
- Kidergarten / Child Care
- Nursing Home / Aged Care
- Community Centre
- Place Of Worship
- Caravan Park
- Stream Level Gauge & 1% AEP Flood Level
- Municipal Depot
- Group Camp
- Sewer Pumping Station

7

DON VALLEY

MILLGROVE

YARRA RANGES

YARRA JUNCTION

WESBURN

LAUNCHING PLACE

Don River at Dalry Rd, Don Valley

Yarra River at Doon Reserve, Yarra Junction

Doon Reserve Caravan Park

Hoddles Creek at Warburton Hwy, Launching Place

Yarra Junction Memorial Reserve

Little Yarra River at Yarra Junction 1% AEP Flood Level: 2.52m (116.2m AHD)

Upper Yarra Cemetery - Wesburn

Haining Farm

Don River

Yarra River

Little Yarra River

Hoddles Creek

Don Creek

Platts Creek

Frenchmans Creek

Yankee Jim Creek

Unnamed

Unnamed

Ricketsons Lane

Farm Lane

Dalry Rd

Ismails Lane

Don Rd

Old Don Rd

Williams Rd

Government Rd

Estate Rd

Harberts Rd

Elliott Gr

Douglas Pde

Station Rd

Rosella Rd

Cavanagh Rd

Warburton Rail Trl

Railway Rd

Wares Rd

Lowes Rd

Ibis Lane

Settlement Rd

Britannia Creek Rd

Greenridge Ct

Coleman St

Bleaches Lane

Mcowan Cr

Outlook Av

Douglas Pde

Herbert St

Hoddle St

Little Yarra R

Crescent Rd

Upper Crescent Rd

Holmes Rd

Victoria St

Winnish St

Riverview Pde

Barak Dr

Earle St

Gardenhill Rd

Corbetts Rd

Glenview Rd

Sundew Pde

Silverwattle Rd

Warburton Hwy

Doon Rd

Corduroy Rd

Settlement Rd

Alpine Blvd

Scenic Dr

Bellbird Av

TS Piper

Wellman St

Grieve St

Orchid St

View Rd

5,820,500°N

5,819,500°N

5,818,500°N

5,817,500°N

375,000°E

376,000°E

377,000°E

378,000°E

379,000°E

380,000°E

0

1

kilometres

Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

7. Yarra River (Yarra Junction)

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Shopping Centre
Creek / Channel
Bicycle / Walking Trail
Flood Model Limit (Little Yarra River)

1% AEP Flood Depth
Greater than 0.6m
0.3m to 0.6m
Up to 0.3m

CFA Fire Station
Ambulance Station
Place Of Worship
School / College
Kindergarten / Childcare
Police Station
Community Centre
Telephone Exchange
Caravan Park
Stream Level Gauge & 1% AEP Flood Level
Sewer Emergency Relief Point
Sewer Pumping Station

YARRA RANGES

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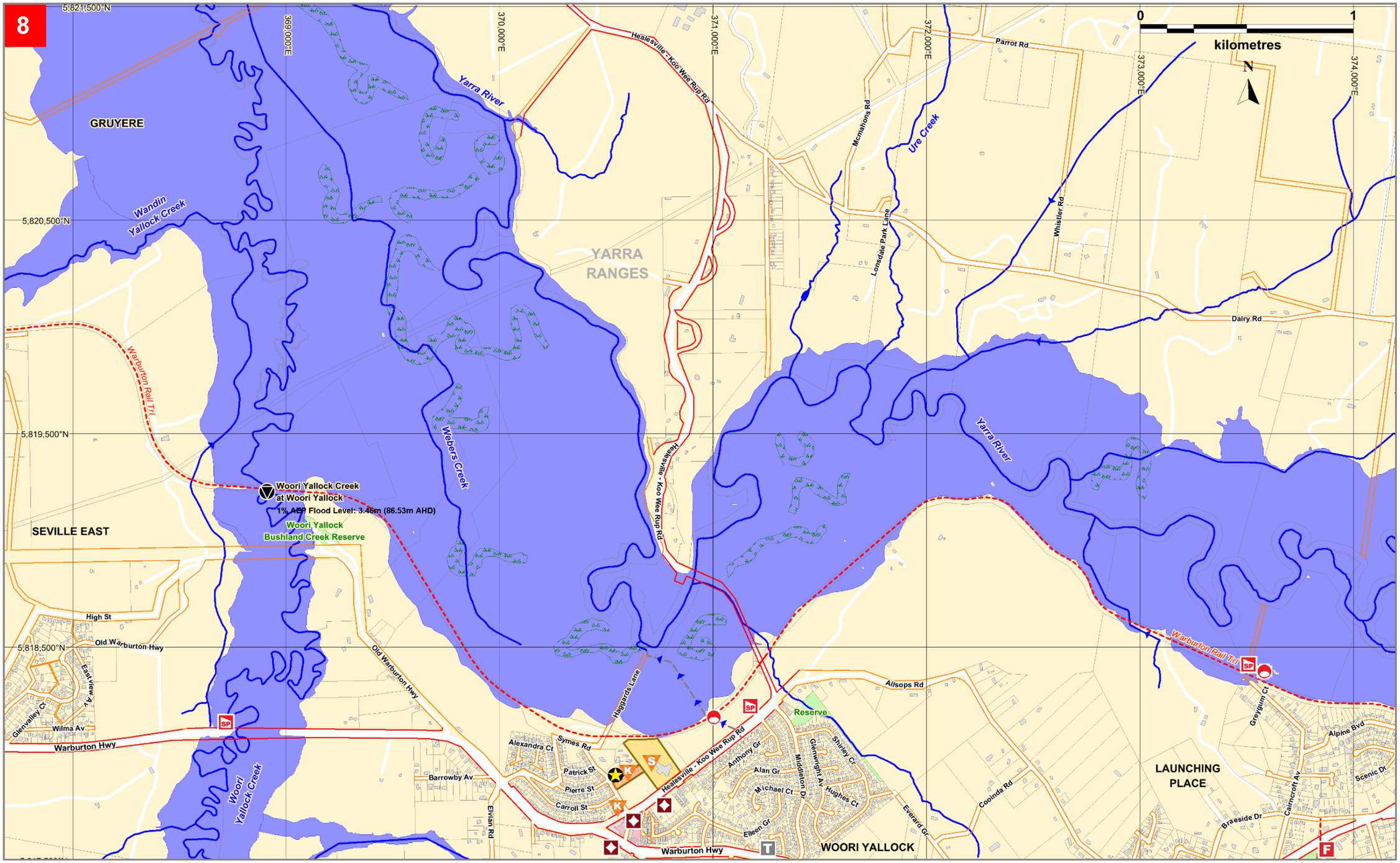


Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

8. Yarra River (Woori Yallock)

- Building
- Area of Interest
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Shopping Centre
- Natural Wetland
- Creek / Channel
- Bicycle / Walking Trail
- School / College
- Kindergarten / Childcare
- CFA Fire Station
- Place Of Worship
- Telephone Exchange
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge
- Emergency Coodination Centre
- Sewer Pumping Station
- Sewer Emergency Relief Point

9

Wombat Way
Bridgewater Rd
Wattle Creek
Ducks Lane
Davross Ct
SEVILLE EAST
Trib Of Woori Yallock Creek
Douthie Rd
Trib Of Woori Yallock Creek
Warburton Hwy
Eileen Gr
Selby Rd
Nester Rd
Woori Yallock Reserve
Elvian Rd
Shevlins Lane
Burr Rd
WOORI YALLOCK
Devils Creek
Schoolhouse Rd
Healesville–Koo Wee Rup Rd
YARRA RANGES
SEVILLE
Carson Rd
Mcquies Rd
Lone Star Creek
Longs Rd
Gardiner Rd
Sheepstation Creek Recreation Reserve
Woori Yallock Creek
Beenak Rd
Douthie Rd
Thextons Rd
Sheepstation Creek Rd
Woori Yallock Creek at Parslows Rd, Yellingbo
Woori Yallock Creek
Carters Lane
YELLINGBO
Yellingbo Nature Conservation Reserve
Foy Lane
Angus Rd
Macclesfield Rd
Cockatoo Creek
Healesville–Koo Wee Rup Rd
Mccrae Creek
Bindea Rd
Shaw Rd
Lake Yellingbo
McCrae Creek at Yellingbo
N
0
1
kilometres

368,000°E
369,000°E
370,000°E
371,000°E
5,817,500°N
5,816,500°N
5,815,500°N
5,814,500°N
5,813,500°N

Flood Modelling completed by Melbourne Water, November 2007. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

9. Woori Yallock Creek (Yellingbo)

- Building
- Area of Interest
- Shopping Precinct
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland
- Creek / Channel
- Bicycle / Walking Trail
- Flood Model Limit (Woori Yallock Creek)

- School / College
- Kindergarten / Child Care
- Community Centre
- Place Of Worship
- CFA Fire Station
- Telephone Exchange
- Stream Level Gauge

Flood Modelling completed by Melbourne Water, May 2013. Map Produced by VicSES August 2020.

Building
Area of Interest
Shopping Precinct
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Creek / Channel
Bicycle / Walking Trail

School / College
Kidergarten / Child Care
Community Centre
Place Of Worship
Fire Station
Group Camp

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

10. Wandin Yallock Creek (Wandin East)

11

5,820,500°N

5,819,500°N

5,818,500°N

5,817,500°N

362,000°E

363,000°E

364,000°E

365,000°E

366,000°E

367,000°E

Darling Rd

Darling Rd

Ormistead Rd

Woodland Way

GRUYERE

Maurice Rd

Gruyere Rd

Ross Rd

Killara Rd

Warburton Rail Trl

Wandin Yallock Creek at Chandler Rd, Seville East

1% AEP Flood Level: 2.83m (105.9m AHD)

Kylie Lane

Lord Rd

Bethune Rd West

Bethune Rd

George St

Sunnyside Rd

Tolmie Av

Chandler Rd

Dominic Rd

Gray Rd

Wandin Yallock Creek

Victoria Rd

Victoria Rd

Victoria Rd

Railway Rd

Walker Rd

YARRA RANGES

English St

Seymour St

Valley Rd

Old Warburton Rd

School Rd

Howard St

Haag Rd

Station Rd

Amanda Ct

Ashley Ct

Blair Cl

Drummond Rd

Raleigh St

Britton Rd

Hickman Pl

Penola Dr

Russell Rd

Norman Berry Dr

Lanning Cr

SEVILLE

Warburton Hwy

Warburton Hwy

Old Warburton Hwy

Glenvalley Cr

Wilma Av

High St

Stuart Rd

Joyce Rd

Peters Rd

Doolthie Rd

Bridgewater Rd

Lakala Rd

Seville Recreation Reserve

Winifred St

Read Rd

Bell St

Paynes Rd

Monbulk - Seville Rd

Ducks Lane

Ducks Lane

Davross Ct

SEVILLE EAST

Merlon Way

Sabire Av

Burgi Hill Rd

Wild Cattle Creek

Cherrystone Dr

Tainton St

Weymar Cr

Mayo Ct

Railway Pde

Warburton Rail Trl

Rue De Gare

Hendersons Rd

Wallace Rd

Quayle Rd

WANDIN NORTH

Warburton Hwy

Clegg Rd

Rouget Rd

Wandin North Reserve

Victory Av

De Lancey Rd

Nicholas Rd

Mary Rd

Beenak Rd

0

1

kilometres

N

Flood Modelling completed by Melbourne Water, May 2013. Map Produced by VicSES August 2020.

Building

Area of Interest

1% AEP Riverine Flood Extent (Depth Unavailable)

Shopping Precinct

Creek / Channel

Bicycle / Walking Trail

School / College

Kindergarten / Childcare

CFA Fire Station

Place Of Worship

Telephone Exchange

Stream Level Gauge & 1% AEP Flood Level

Community Centre

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

11. Wandin Yallock Creek (Seville)

YARRA RANGES

12

COLDSTREAM

5,827,500°N

Skye Rd

Hexham Rd

Yarra River

Coranderrk Creek

Coranderrk Bushland

Healesville - Koo Wee Rup Rd

Badger Av

Garnook Gr

Toolebewong Rd

BADGER CREEK

Trib Of Yarra Creek

5,826,500°N

Pine Av

5,825,500°N

Briarty Rd

Range Rd

GRUYERE

Clugston Rd

YARRA RANGES

Highett Rd

5,824,500°N

Howitt Rd

HEALESVILLE

Yarra River

Range Rd

5,823,500°N

Warramate Nature Conservation Reserve

5,822,500°N

Miller Rd

Syme Rd

Redgum Trk

Woori Yallock Creek

Webers Creek

Yarra River

WOORI YALLOCK

367,000°E

368,000°E

369,000°E

370,000°E

371,000°E

5,821,500°N

Killara Rd

Yarraloch Way

N

0

1

kilometres

Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

Building

Area of Interest

1% AEP Riverine Flood Extent (Depth Unavailable)

Natural Wetland

Creek / Channel

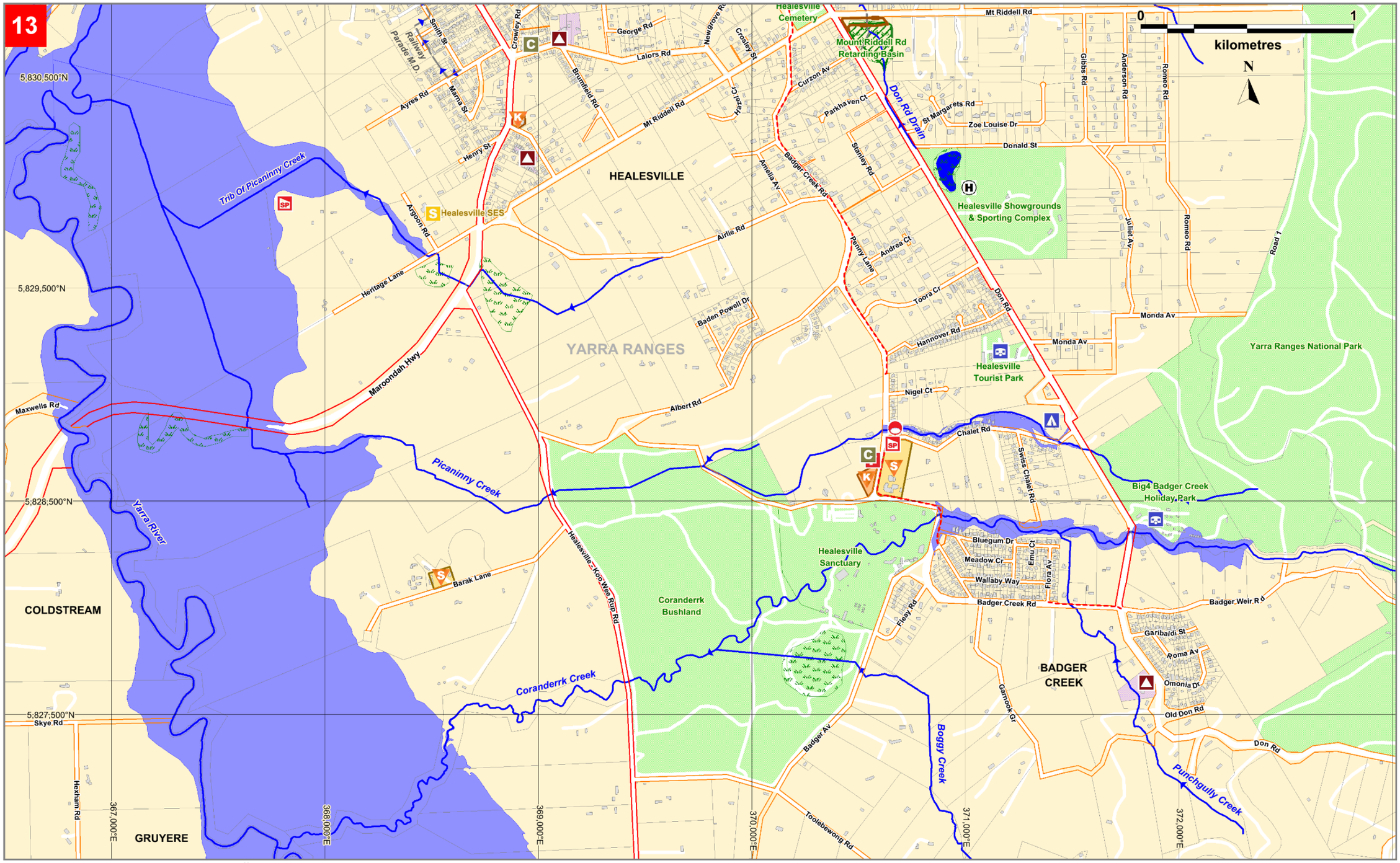
Group Camp

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

12. Yarra River (Gruyere)

13



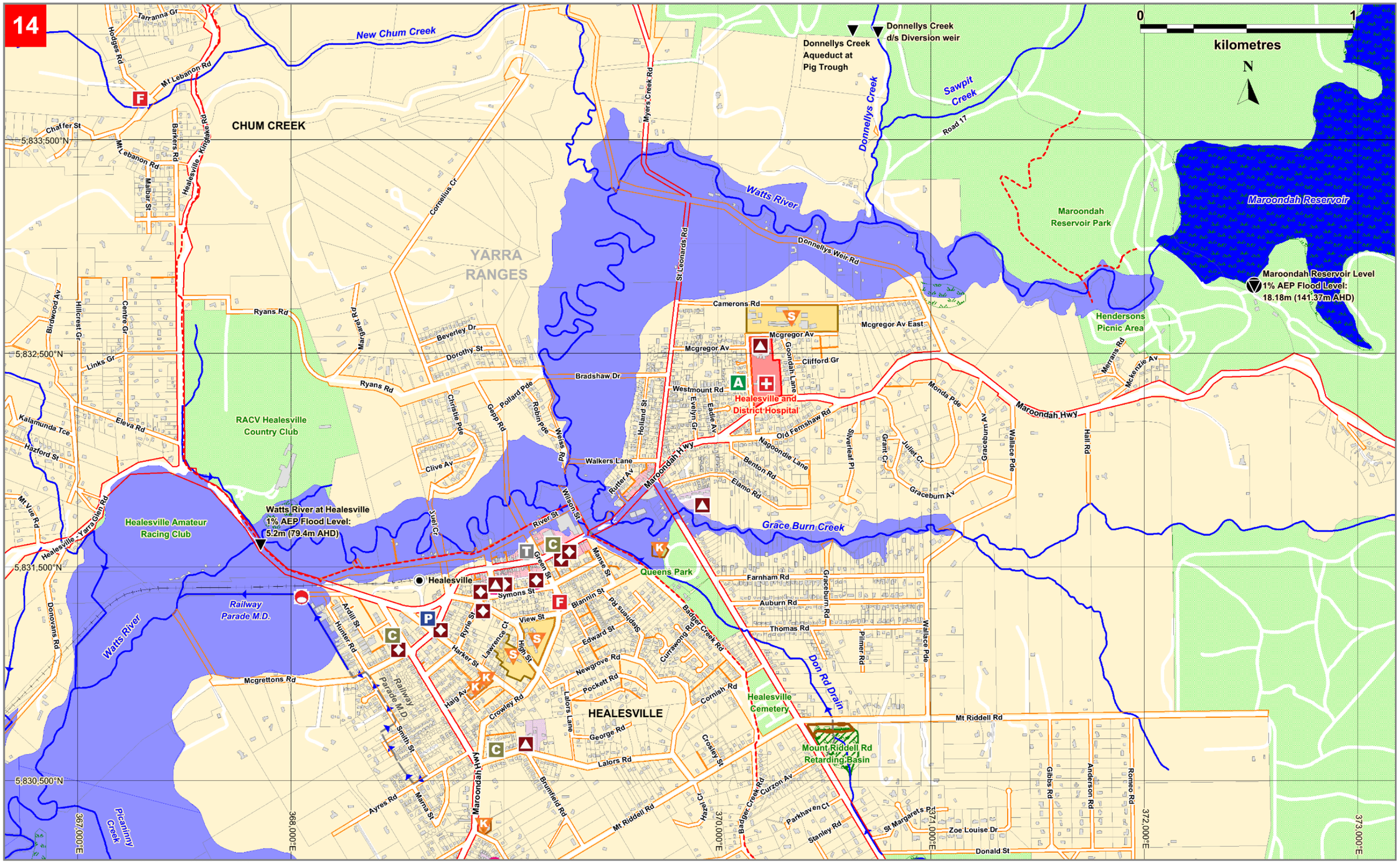
Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

13. Coranderrk Creek (Badger Creek)

- Building
- Area of Interest
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland
- Melbourne Water Retarding Basin
- Waterbody
- Creek / Channel
- Bicycle / Walking Trail
- Levee / Embankment
- Melbourne Water Stormwater Drain
- School / College
- Kindergarten / Childcare
- Fire Station
- Nursing Home / Aged Care
- Community Centre
- Caravan Park
- VicSES Unit
- Helipad
- Sewer Pumping Station
- Sewer Emergency Relief Point
- Group Camp



Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Shopping Centre
Natural Wetland
Melbourne Water Retarding Basin
Waterbody
Creek / Channel
Bicycle / Walking Trail
Levee / Embankment
Melbourne Water Stormwater Drain
School / College
Kindergarten / Childcare
Fire Station
Place Of Worship
Telephone Exchange
Nursing Home / Aged Care
Community Centre
Police Station
Stream Level Gauge & 1% AEP Flood Level
Rain Gauge
Hospital
Ambulance Station
Sewer Emergency Relief Point

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

14. Watts River (Healesville)

15

0 1
kilometres
N

Paul Creek
Tarrawarra Rd
Houghtons Lane
School Lane
Long Gully Rd
Old Healesville Rd
Kalamunda Tce
Mt Vue Rd
Hamtons Spur Rd
Healesville-Yarra Glen Rd
Pauls Creek at Tarrawarra
HEALESVILLE
TARRAWARRA
Simpsons Lane
YARRA GLEN
Trib Of Yarra Creek
Yarra River at Coldstream
1% AEP Flood Level:
7.19m (76.2m AHD)
Yarra River
Lilyponds Creek
YARRA RANGES
Maroondah Hwy
Maxwells Rd
Hyde Park Rd
Maddens Lane
Hill Rd
Skye Rd
COLDSTREAM
GRUYERE

5,831,500°N
5,830,500°N
5,829,500°N
5,828,500°N
5,827,500°N
359,000°E
360,000°E
361,000°E
362,000°E
363,000°E
364,000°E
365,000°E
366,000°E

Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Creek / Channel
Stream Level Gauge & 1% AEP Flood Level
Rain Gauge

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

15. Yarra River (Tarrawarra)

YARRA RANGES

SES Victoria Melbourne Water

16

NILLUMBIK
CHRISTMAS HILLS
YARRA GLEN
YARRA RANGES
YERING
COLDSTREAM

5,831,500°N
5,830,500°N
5,829,500°N
5,828,500°N

Eltham - Yarra Glen Rd
Glenview Rd
Mckinnon Tce
Breakneck
Muir Rd
King St
Unnamed
Yarraview Rd
Minnan Dr
Celia Ct
Gale Ct
Forest St
Symonds St
Semillon Ct
Merlot Ct
Shiraz Rise
Natalie Ct
Kameel Dr
Melba Hwy
Frances Av
Yarra St
Jules Ct
McKenzie Reserve
Pinoak Dr
Sacha Ct
Armstrong Gr
Steels Creek
Yarra Glen Racecourse
Yarra Glen Bypa
Healesville - Yarra Glen Rd
Sayle St
Farrell Av
King St
Yarra Glen Recreation Reserve & Showgrounds
Oliver St
Simpsons Lane
Yarra River at Yarra Glen
1% AEP Flood Level: 8.4m (70.8m AHD)
Yarra Flats Billabongs
Melba Hwy
Yarra River
Sunshine Creek
Glenview Rd
Stringybark Creek
Melba Hwy
Yering Station Winery & Vineyards
Lilyponds Creek
Trib Of Lilyponds Creek
Spadoni's Nature Reserve
Victoria Rd
Stringybark Creek
Olinda Creek
Melbourne Gun Club

0 1
kilometres
N

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Shopping Centre
Creek / Waterway
Bicycle / Walking Trail
CFA Fire Station
School / College
Sewer Pumping Station
Telephone Exchange
Place Of Worship
Police Station
Stream Level Gauge & 1% AEP Flood Level

YARRA RANGES

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

16. Yarra River (Yarra Glen)

Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

17

Flood Modelling completed by Melbourne Water & S P Goh, November 2010. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

17. Yarra River (Yering)

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Waterbody
Creek / Channel
Bicycle / Walking Trail
Flood Model Limit (Olinda Creek)
Stream Level Gauge
Rain Gauge
Drainage / Water Pumping Station

YARRA RANGES

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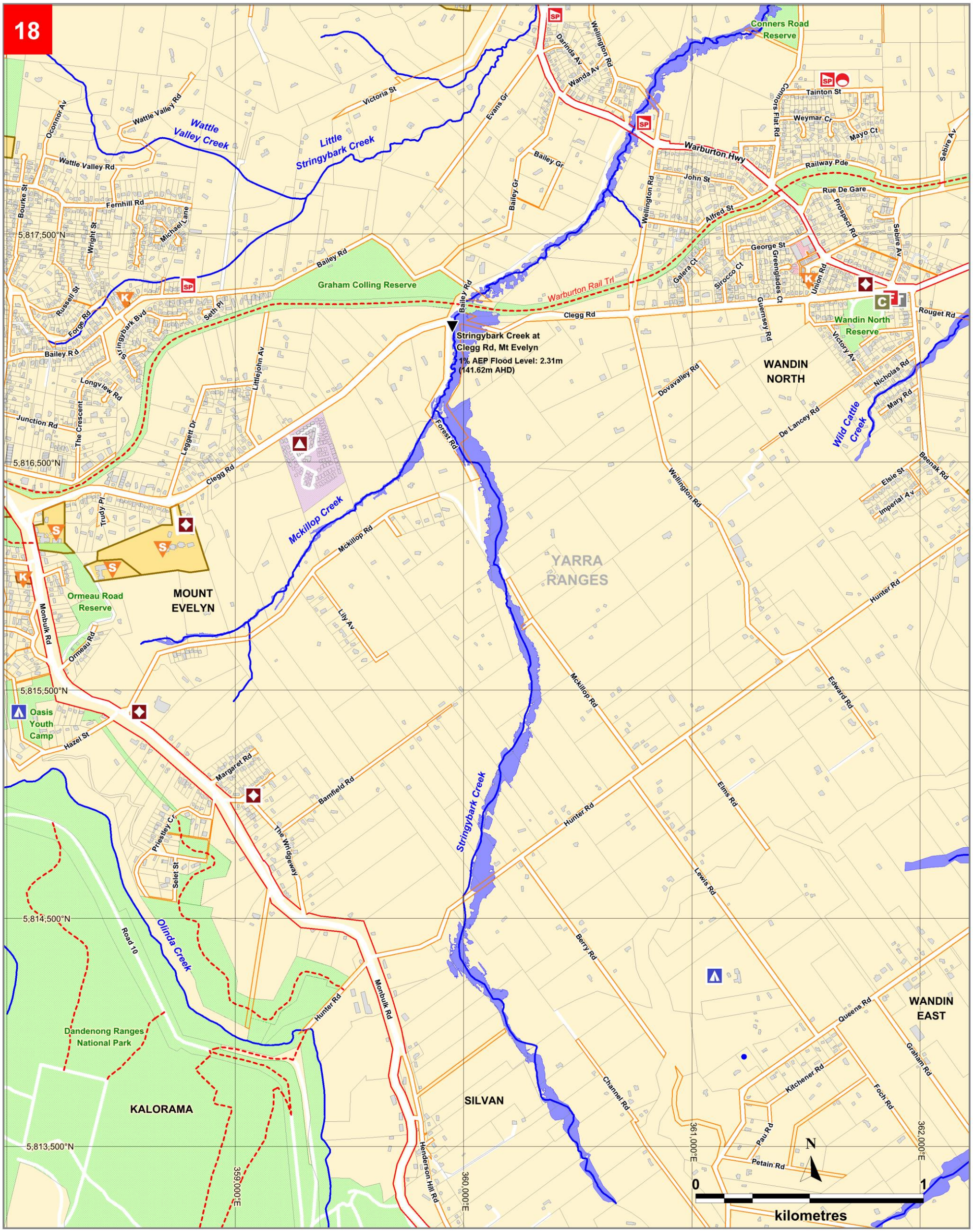


Flood Modelling completed by Melbourne Water, June 2016. Map Produced by VicSES August 2020.

Building
Area of Interest
Shopping Precinct
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Creek / Channel
Bicycle / Walking Trail

School / College
Kidergarten / Child Care
Community Centre
Place Of Worship
CFA Fire Station

Nursing Home / Aged Care
Stream Level Gauge
Telephone Exchange
Group Camp
Sewer Pumping Station
Sewer Emergency Relief Point

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

18. Stringybark Creek (Mount Evelyn)

19

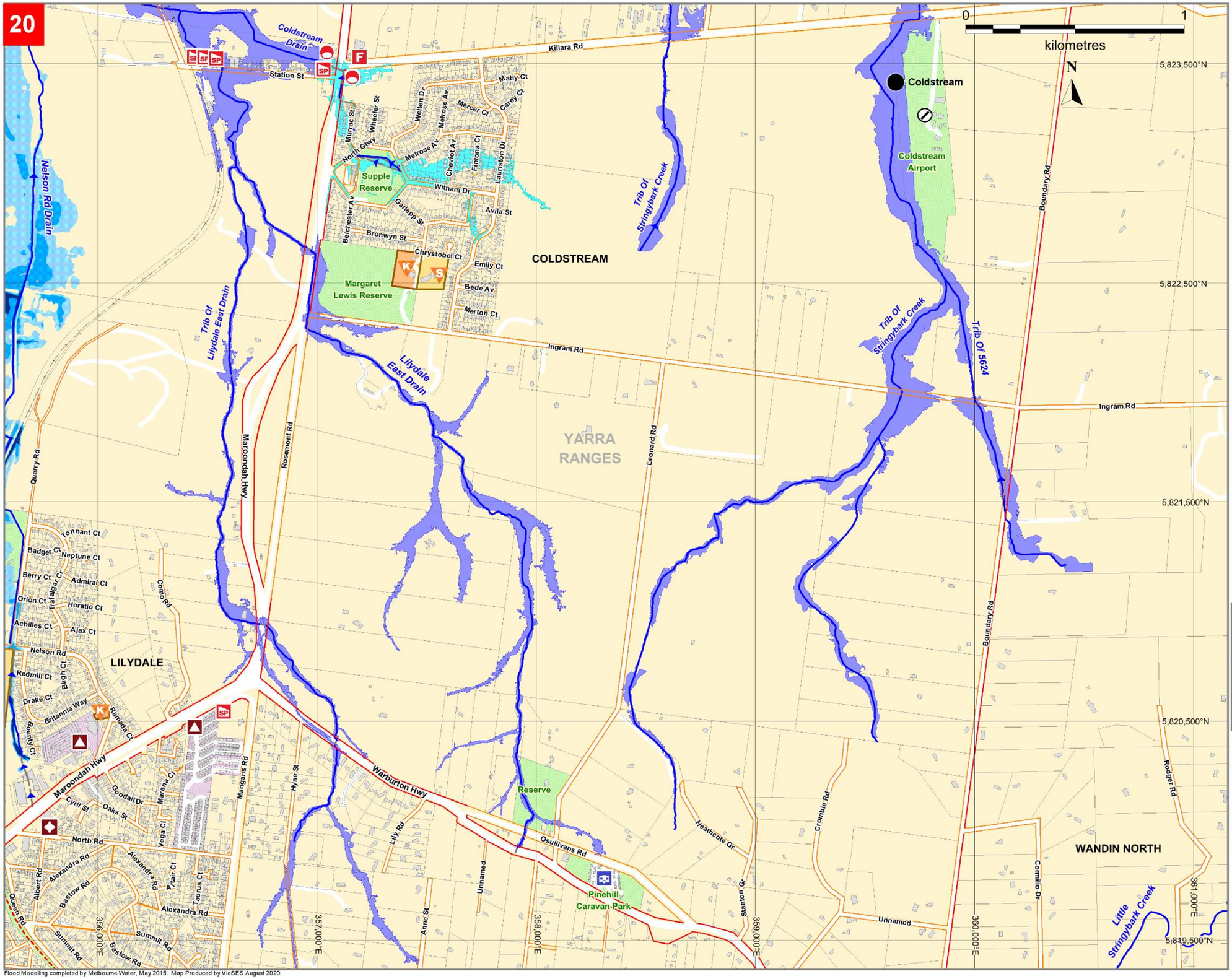
Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Creek / Channel
Bicycle / Walking Trail
School / College
Community Centre
Telephone Exchange
CFA Fire Station

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

19. Stringybark Creek (Gruyere)



Flood Modelling completed by Melbourne Water, May 2015. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

20. Lilydale East Drain (Coldstream)

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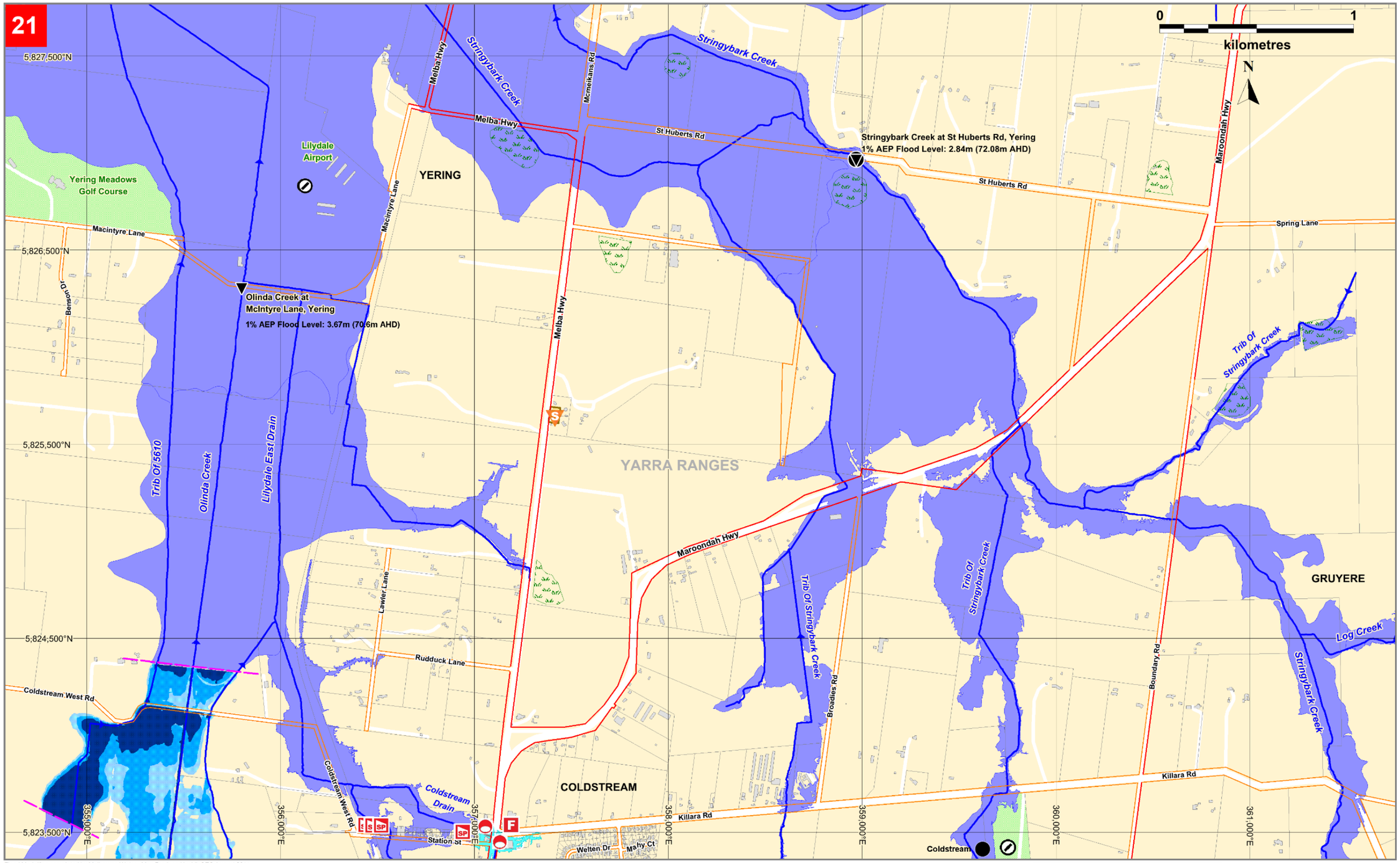

Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

21. Olinda Creek (Yering)

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
1% AEP Flash Flood Extent (Depth Unavailable)

1% AEP Flood Depth
Greater than 0.6m
0.3m to 0.6m
Up to 0.3m
Flood Model Limit (Olinda Creek)
Creek / Channel

CFA Fire Station
School / College
Airfield / Airport
Sewer Pumping Station

Stream Level Gauge & 1% AEP Flood Level
Rain Gauge
Sewer Emergency Relief Point

22

Olinda Creek at York Rd, Mount Evelyn
1% AEP Flood Level: 2.7m (136m AHD)

Flood Modelling completed by SP Goh & Associates, February 2017. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

22. Olinda Creek (Mount Evelyn)

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Melbourne Water Retarding Basin
Waterbody
Shopping Precinct
Creek / Channel
Bicycle / Walking Trail

1% AEP Flood Depth
Greater than 0.6m
0.3m to 0.6m
Up to 0.3m

School / College
Kindergarten / Child Care
Community Centre
Place of Worship
CFA Fire Station

Telephone Exchange
Stream Level Gauge
Rain Gauge
Police Station
Group Camp
Sewer Emergency Relief Point
Sewer Pumping Station

YARRA RANGES

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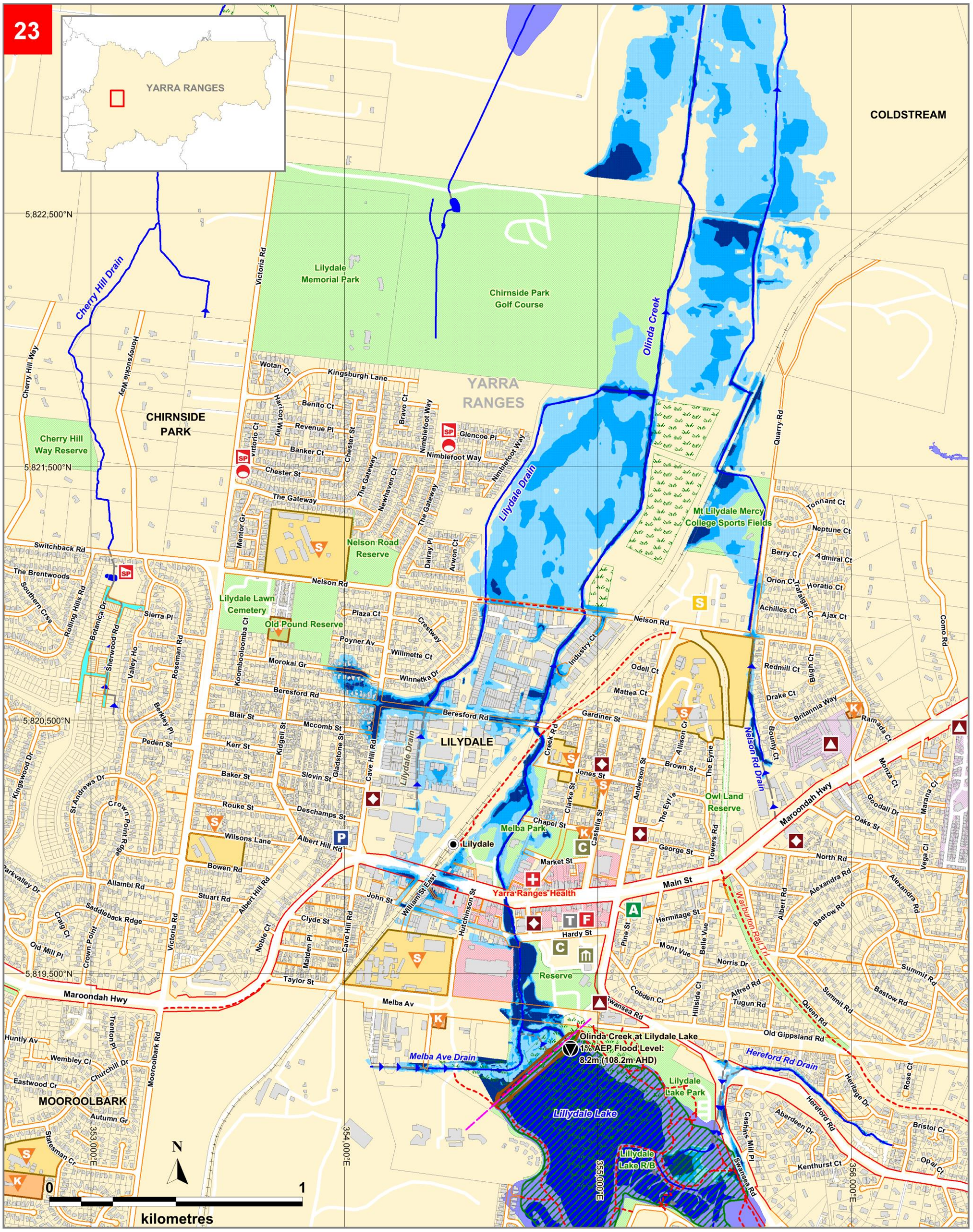


Flood Modelling completed by SP Goh & Associates, March 2014. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

23. Olinda Creek (Lilydale)

- Building
- Area of Interest
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Natural Wetland
- Melbourne Water Retarding Basin
- Waterbody
- Shopping Precinct

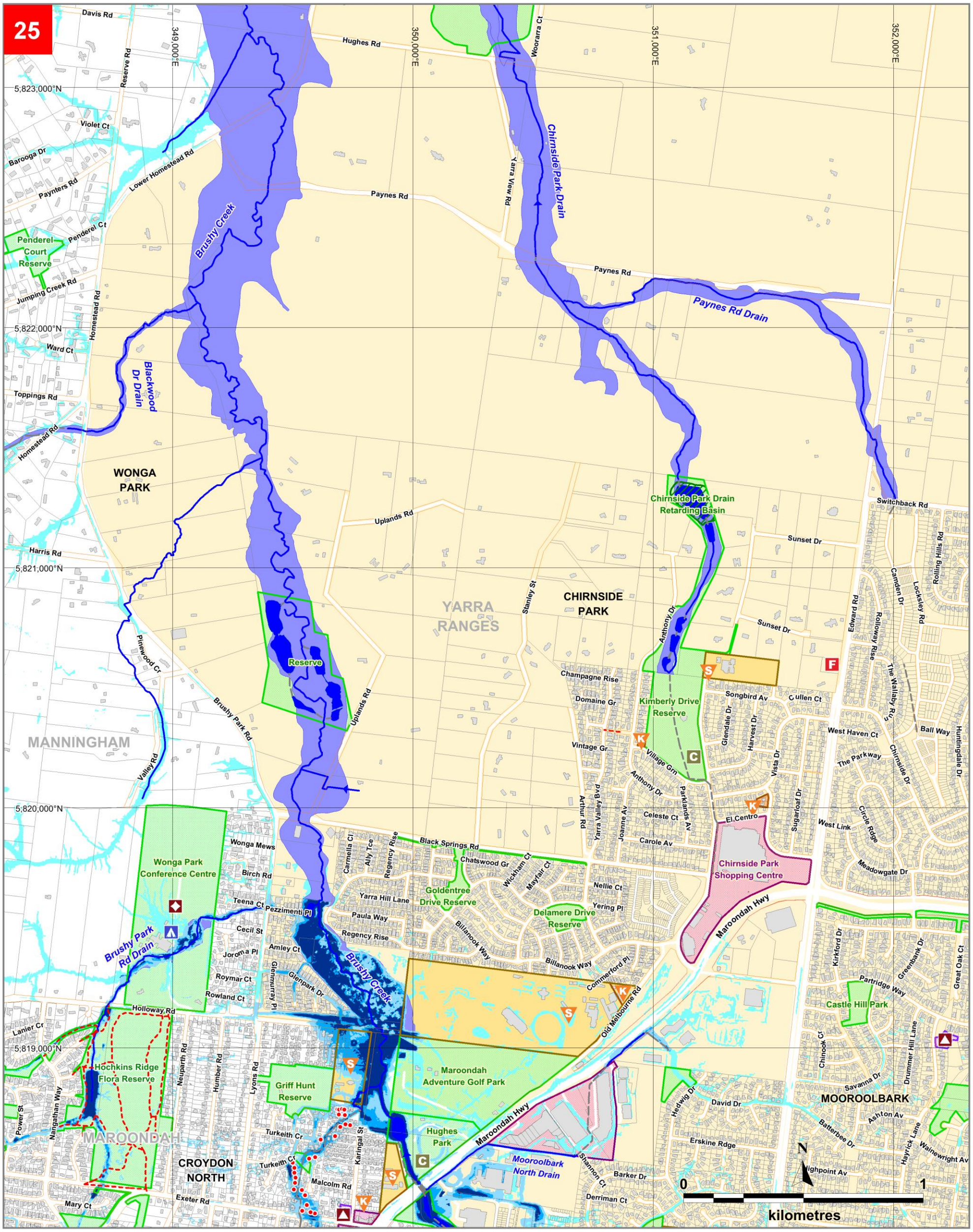
1% AEP Flood Depth

- Greater than 0.6m
- 0.3m to 0.6m
- Up to 0.3m
- School / College
- Kindergarten / Child Care
- Community Centre
- Place of Worship
- CFA Fire Station

- Creek / Channel
- Bicycle / Walking Trail
- Flood Model Limit (Olinda Creek)
- Melbourne Water Stormwater Drain
- Levee / Embankment
- Police Station
- Nursing Home / Aged Care
- Ambulance Station
- Hospital

- Telephone Exchange
- Stream Level Gauge
- Rain Gauge
- Victoria State Emergency Service
- Municipal Offices
- Sewer Pumping Station
- Sewer Emergency Relief Point

Brushy Creek flood modelling completed by Engeny, February 2019. Map Produced by VicSES August 2020.



Brushy Creek flood Modelling completed by Engeny, February 2019. Manningham flood modelling completed by Cardno, August 2015. Map Produced by VICSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

25. Brushy Creek (Chirnside Park)

- Building
- Area of Interest
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Waterbody
- Melbourne Water Retarding Basin

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm

- Shopping Precinct
- Creek / Channel
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- School / College
- Kindergarten / Child Care
- Community Centre
- Nursing Home / Aged Care

- CFA Fire Station
- Place of Worship
- 1% AEP Over-Floor Flooding Risk
- Group Camp

26

Durham Rd Retarding Basin
Lomond Av
Hawthory Rd
Anita St
Durham Rd
Cambridge Rd
Belfast Rd
Mt Dandenong Rd
Collins Pl
Charles St
Eothen Lane
Balmoral St
Erica Cr
Macdonnell Ct
Maple Ct
Willow Ct
Bristol Ct
Hammersley Ct
Jacaranda Av
Five Ways Drain
Shelley Av
Browning St
Tennyson Av
Russo Pl
Moira Rd
Senar St
Jacaranda Avenue Reserve
Tri - Tree Ct
Beech St
Derby Rd
Tamworth Rd
Treetop Dr
Regina St
Alpine Way
Byron Rd
Church St
Wannan Ct
Palm Gr
Denman St
Balmoral St
Edenhope St
Strathbogie Ct
Fir Ct
Walnut Dr
Trevallyn Cl
Unity Way
Leonard Rd
Friendly Ct
Pleasant St
Glendale Ct
Eden Way
Atherton Ct
Chestnut Ct
Tasman Ct
Landstrom Qdrt
Kilsyth Av
Unnamed
Stirling Ct
Foulds Ct
Landstrom Qdrt
Mimosa Av
Deborah St
Sophie St
Brettby Way
Rene Ct
Montrose Rd
Greeves Dr
Innisfree Walk
Flinders Ct
Banksia St
Cosmo Ct
Hillview Dr
Kilborn Ct
Smithacres Rd
Magnolia Gr
Sarah Ct
Lena Gr
Luscombe Ct
Mount Dandenong Tourist Rd
5,814,000°N
Geoffrey Dr
Arnold St
Hayes Ct
Lockhart Ct
Graham Av
Kilsyth M.D. D.S.
Urana St
Gladesville Dr
Hansford Cl
Hamilton Ct
Donald Cl
Orchard St
CROYDON
Montrose Recreation Reserve
Buttler St
Cheryl Anne Cr
Paramount Av
Landy Ct
Belinda Cl
Colchester Rd
Tinarra Ct
Crestview Cl
Actoal Dr
Gratten Rd
Boxtree Rd
Yeaman Rd
Stradbroke Rd
Aileen Av
Garden St D.S.
Garden St
Lade Av
KILSYTH
Canterbury Rd
Kirkwood Ct
Ash Gr
MONTROSE
Stephen Av
Liverpool Rd
Timberglades Rd
Dr Ken Leversha Reserve
Currawong Rd
Karabeal Ct
5,813,000°N
YARRA RANGES
Ruby Rd
Bright Rd
Bungalook Creek
Fussell Rd
Fussell Rd Drain
Southfork Dr
Leeds Dr
Eastspur Ct
Sunset Dr
Jeanette Maree Ct
Sheffield Rd
Lower View Rd
Skye Ct
Cloverlea Dr
Taruna Rise
MAROONDAH
Bungalook Creek at Fussell Rd R/B, Montrose
1% AEP Flood Level: 8.39m (152.19m AHD)
Colchester Rd Retarding Basin
Fussell Road R/B
5,812,000°N
Bungalook Creek
Hakea Dr
Gordon Av
Bracken Av
Glasgow Rd
Tereddan Dr
Rowe St
Jubilee Rd
KILSYTH SOUTH
Sheridan Cl
Chamberlain Dr
Oliver Ct
Chandra Av
Chloe Cl
Jodie Pl
Pioneer Way
Clarkedale Rise
Eliana Ct
Collier Rd
Sandy Wynd
Independence Rise
Watermoor Av
Bilbury Ct
Marsden Ct
Calmsden St
Rendcomb St
Handasyde Av
5,811,000°N
Eycot St
Stroud Ct
Appletree Hill Reserve
Dandenong Creek
Hill View Cl
Dandenong Ranges National Park
Chedworth Ct
Kerrilea Ct
Memory Ct
Lillypilly Lane
BORONIA
Beresford Dr
Torresdale Dr
Tolhurst Av
351,000°E
352,000°E
353,000°E
354,000°E
Chandlers Lane
KNOX
N
0
1
kilometres

Flood Modelling completed by Engeny, February 2019. Map Produced by VicSES September 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

26. Kilsyth Main Drain & Fussel Rd Drain (Kilsyth)

- Building
- Area of Interest
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Waterbody
- Shopping Precinct
- Melbourne Water Retarding Basin

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm
- Creek / Channel
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- 1% AEP Over-Floor Flooding Risk
- Telephone Exchange
- CFA Fire Station
- Place of Worship
- School / College
- Kindergarten / Child Care
- Community Centre
- Nursing Home / Aged Care
- Ambulance Station

SES Victoria State Emergency Service

Melbourne Water

27

FERNY CREEK
SHERBROOKE
KALLISTA
UPWEY
TECOMA
BELGRAVE
BELGRAVE HEIGHTS
BELGRAVE SOUTH
SELBY
YARRA RANGES

354,000°E
355,000°E
356,000°E
357,000°E
5,804,500°N
5,803,500°N
5,802,500°N
5,801,500°N

Sherbrooke Creek
Ferny Creek
Monbulk Creek
Webbs Rd
Mast Gully Rd
Belgrave - Ferny Creek Rd
Woodleigh Av
Florence Av
Cecil Ct
Gordon Av
Anderson Rd
Bay St
Day St
Oakland Av
Durang Rd
Acacia Av
Blackwood St
Leprosa Lane
Sandells Rd
Blue Gum Ct
Hazel Gr
Douglas St
Morven Av
Peters Rd
Gully Cr
Alexander Av
Kaye Rd
Olive Gr
Pauline Av
The Serpentine
Kookaburra Av
Gallagher St
Forest Rd
Acacia Av
Alpine Av
Wedgewood Av
Cole Av
Violet Larsen Reserve
Glen Harrow Heights Road Reserve
Dandenong Ranges National Park
Upway Recreation Reserve
Austral Av
Sophia Gr
Hakea St
Alec St
View Rd
Bennett Av
Terrys Av
Leslie St
Frame Av
Currie Av
Kitchener Rd
Rutherford Rd
Monbulk Rd
Glen Harrow Heights Rd
Collier Av
Walter St
Tekoi Av
Old Monbulk Rd
Ferguson St
Kia Ora Av
Burwood Hwy
Kumbada Av
Kalulu Rd
Wattle Av
Winscombe Av
Rocksleigh Av
Dickinson St
Mahony St
Tecoma
Clifford Gr
Thompson Rd
Hillside Gr
Glentern Rd
Laurie Av
Belgrave
Stoney Rd
Belgrave - Gembrook Rd
Argonne Pde
Liege St
Nation Rd
Sunny Cl
Hardy St
Greenwell Rd
Durang Rd
Borang Av
Minak Reserve
Charles St
James St
Wombalana Rd
Colombo Rd
Bayview Rd
Gums Av
Minter St
Seymour St
Station St
Talbot Av
Mcnicol Rd
Fairy Dell Rd
Leah Av
Benson St
Dalkeith Cr
Borthwick Park
Effie Av
Edward St
Grey St
Centre Rd
Godber Ct
Brooking St
Best St
Farquharson Av
Colin Av
Creek Rd
Clematis St
Selby Park
Byrne St
Evelyne Rd
Belgrave Recreation Reserve
Hazelvale Rd
Merrigum Lane
Martin St
Park Dr
Myamin Cl
Toorac Rd
Kaola St
Arbor Av
Maskell St
Thomas St
Belgrave Lake Park
Broadway
Waratah Av
Woodland Gr
Bellbird Street Reserve
Currajong Av
Ronald Av
Maskells Hill Rd
Old Reservoir Rd
Judkins Av
Boronia Av
Maple Av
Cedar Gr
Temple Rd
Beech Av
Unnamed
Arthur St
Green St
Bellbird St
Belgrave - Hallam Rd
Mt Morton Rd
Glen Rd
Reserve
Selby Conservation Reserve
Currajong Av
Colby Drive Reserve
The Crescent
Marama Rd
Avonside Rd
Lockwood Rd
Belgrave Heights Central Park Reserve
Bolton Rd
Greenhill Rd
Temple Rd
Horizon Rd
Birdsland Reserve
Mt Morton Conference Centre
Convention Av
Verona St
Cambridge St
Belgrave - Hallam Rd
Vale Rd
Harvey St
Bartley Rd
Vista Rd
Reserve
Mt Morton Rd
Lockwood Rd

N
0
1
kilometres

Flood Modelling completed by Melbourne Water & GHD, February 2012. Map Produced by VicSES August 2020.

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Shopping Precinct
Bicycle / Walking Trail
Creek / Channel
Melbourne Water Stormwater Drain

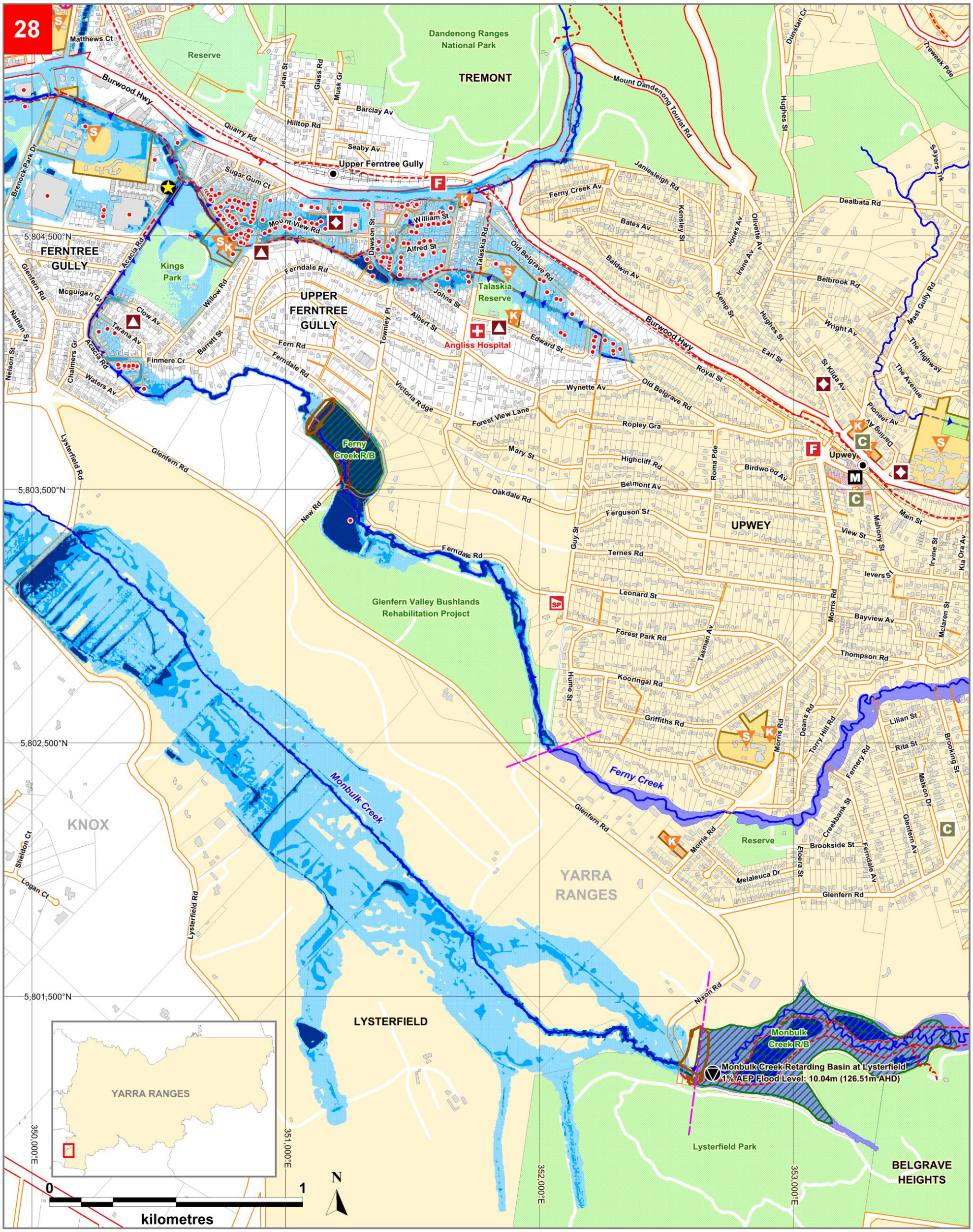
Fire Station
Place of Worship
School / College
Kindergarten / Child Care
Community Centre
Telephone Exchange

1% AEP Over-Floor Flooding Risk
Ambulance Station
Police Station
Sewer Pumping Station
Group Camp

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

27. Ferny & Monbulk Creeks (Belgrave)



Flood Modelling completed by Melbourne Water & GHD, February 2012. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

28. Ferny & Monbulk Creeks (Upwey & Lysterfield)

- Building
- Area of Interest
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Waterbody
- Shopping Precinct
- Melbourne Water Retarding Basin
- Flood Model Limit
- Levee / Embankment
- Bicycle / Walking Trail

1% AEP Flood Depth

- Greater than 0.6m
- 0.3m to 0.6m
- Up to 0.3m
- Creek / Channel
- Melbourne Water Stormwater Drain
- 1% AEP Over-Floor Flooding Risk
- Telephone Exchange
- Municipal Offices
- Fire Station
- Place of Worship
- School / College
- Kindergarten / Child Care
- Community Centre
- Nursing Home / Aged Care
- Emergency Coordination Centre
- Hospital
- Stream Level Gauge & 1% AEP Level Gauge
- Rain Gauge
- Sewer Pumping station

29

Building
Area of Interest
1% AEP Riverine Flood Extent (Depth Unavailable)
Creek / Waterway
Bicycle / Walking Trail
Fire Station
Community Centre
Stream Level Gauge
Rain Gauge

352,000°E
353,000°E
354,000°E
355,000°E
356,000°E
5,799,500°N
5,798,500°N
5,797,500°N
5,796,500°N
5,795,500°N

Lysterfield Park
Wellington Rd
Ryans Rd
Retreat Rd
Kirkham Rd
Orchid Rd
Baluk William Nature Conservation Reserve
Engelke Rd
Bellany Rd
Potter Rd
Belgrave - Hallam Rd
Engelke Rd
Altson Rd
BELGRAVE SOUTH
Spring Rd
Courtneys Rd
Grant Rd
Mervyn Rd
Logan Park Rd
Brandt Rd
YARRA RANGES
LYSTERFIELD
Lloyd Park
Engelke Rd
Kerrs Lane
Blackstone Lane
Wellington Rd
Mountain Flat Rd
Narre Warren East Recreation Reserve
Edelphils Rd
Belgrave - Hallam Rd
NARRE WARREN EAST
Norfolk Rd
Horswood Rd
Eumemmerring Creek Upper
Raes Park
Boundary Rd
Berwick Rd
Boundary Rd
Eumemmerring Creek d/s Hallam/Belgrave Rd, Narre Warren Nth
1% AEP Flood Level: 3.83m (61.9m AHD)
Campbelltown Miniature Railway Park
Aurisch Dr
NARRE WARREN NORTH
CASEY
Harkaway Rd
Belgrave - Hallam Rd
Eumemmerring Creek Upper South Br
Bailey Rd
N
0
1
kilometres

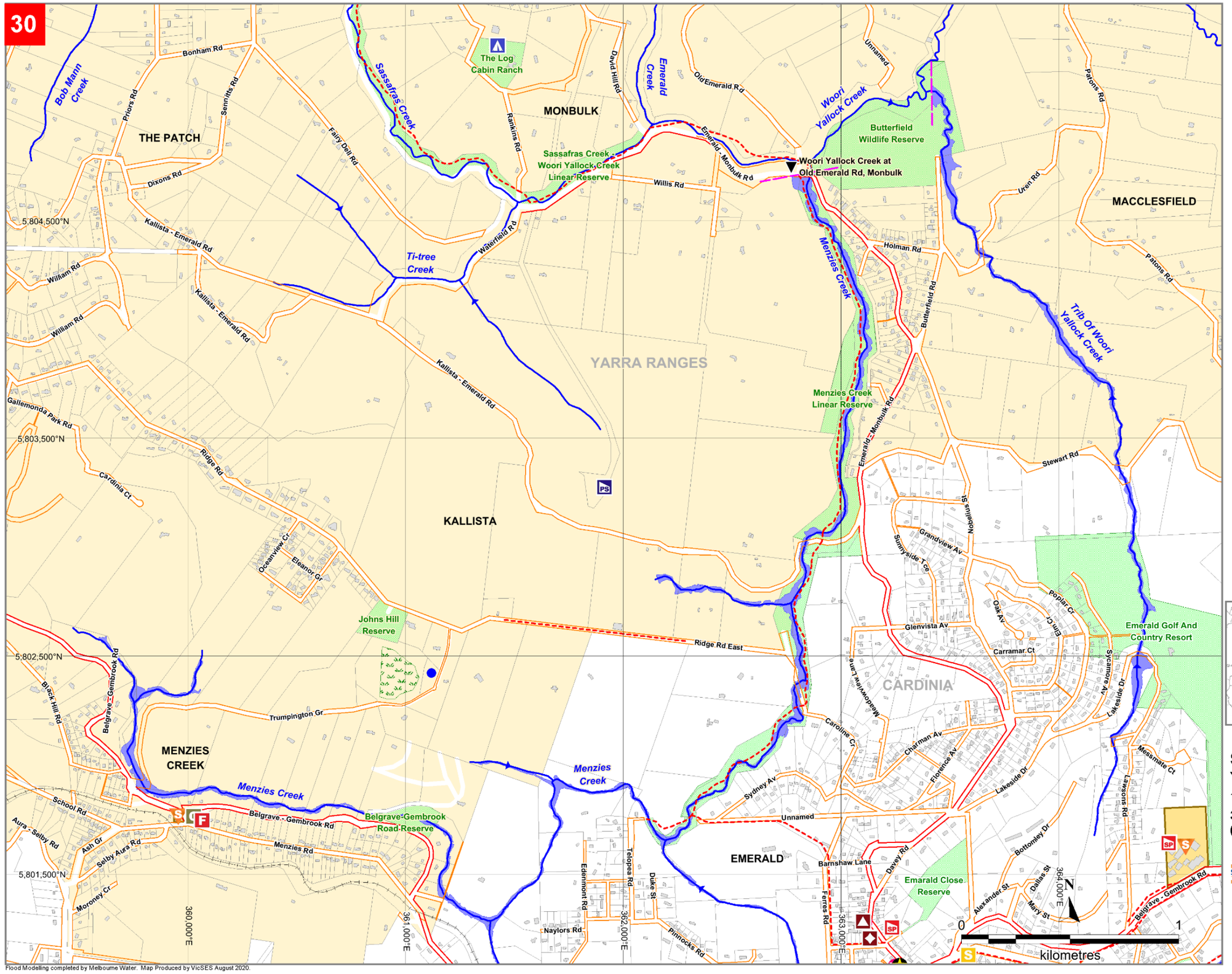
Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

29. Eumemmerring Creek Upper (Narre Warren East)

SES Victoria Melbourne Water



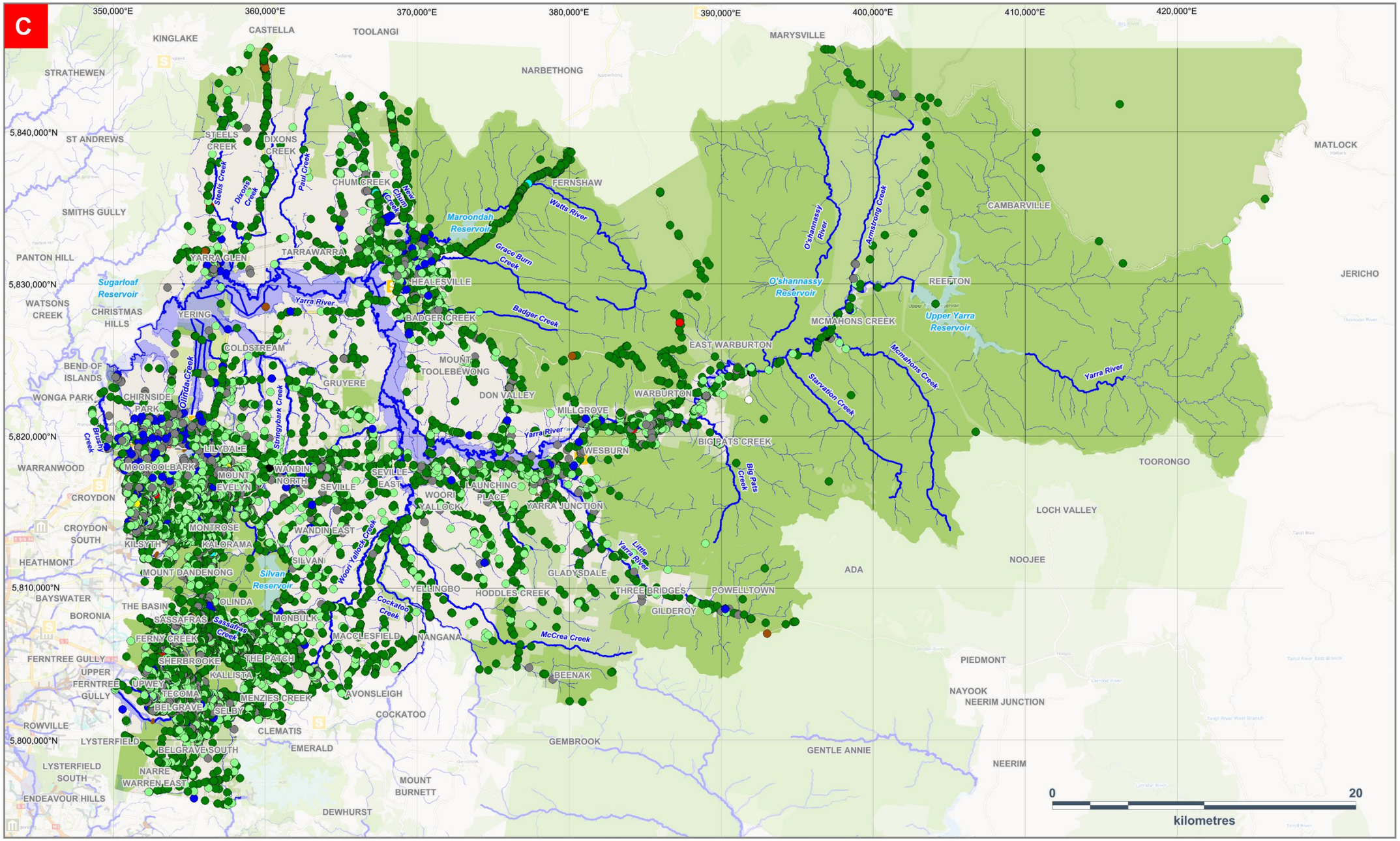
Flood Modelling completed by Melbourne Water. Map Produced by VicSES August 2020.

SHIRE OF YARRA RANGES

1% AEP (100yr ARI) Flooding

30. Menzies Creek (Kallista)

VICSES Severe Weather (Storm or Flood) Requests for Assistance Mapping



Map Produced by VICSES September 2020.

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YARRA RANGES SHIRE

Version 4: September 2020

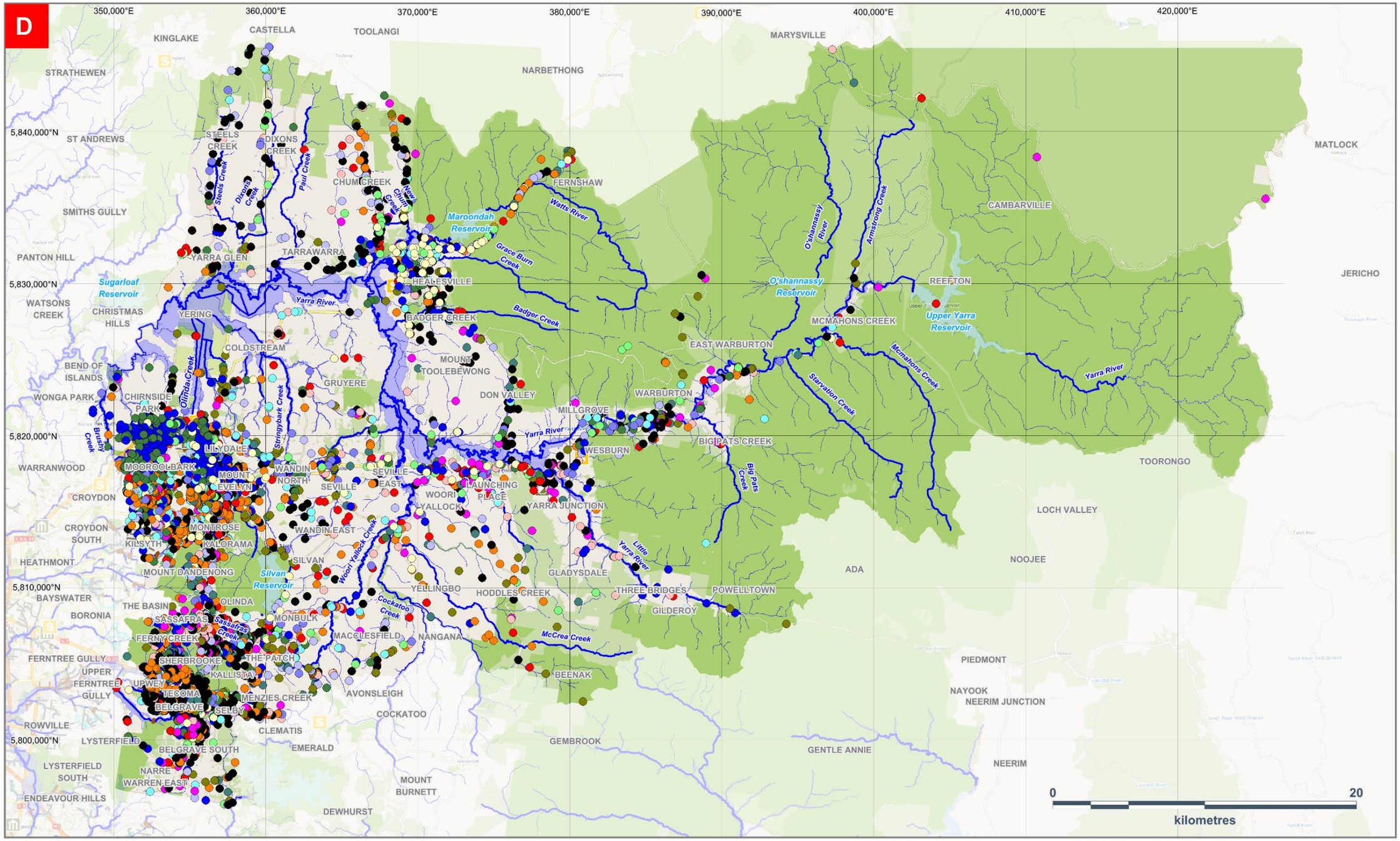
C. Severe Weather Requests for Assistance by Job Type (July 2009 - August 2020)

- Vegetation
- Waterbody
- Melbourne Water Stormwater Drain
- Waterway
- Municipal Offices
- Municipal Depot
- State Emergency Service

Severe Weather RFAs (Storm or Flood)

- Assist Agency (10)
- Building Damage (2,671)
- Dam Incident (6)
- Flooding (535)
- Landslide (24)
- Loose Debris / Object / Fence (8)
- Other (9)
- Rescue (22)
- Sandbag Request (2)
- Tree Down (6,244)
- Tree Down Traffic Hazard (9,443)

D



Map Produced by VICSES September 2020.

N

YARRA RANGES SHIRE

Version 4: September 2020

D. Severe Weather Requests for Assistance by Event (July 2009 - August 2020)

- Vegetation
- Waterbody
- Melbourne Water Stormwater Drain
- Waterway
- Municipal Offices
- Municipal Depot
- State Emergency Service

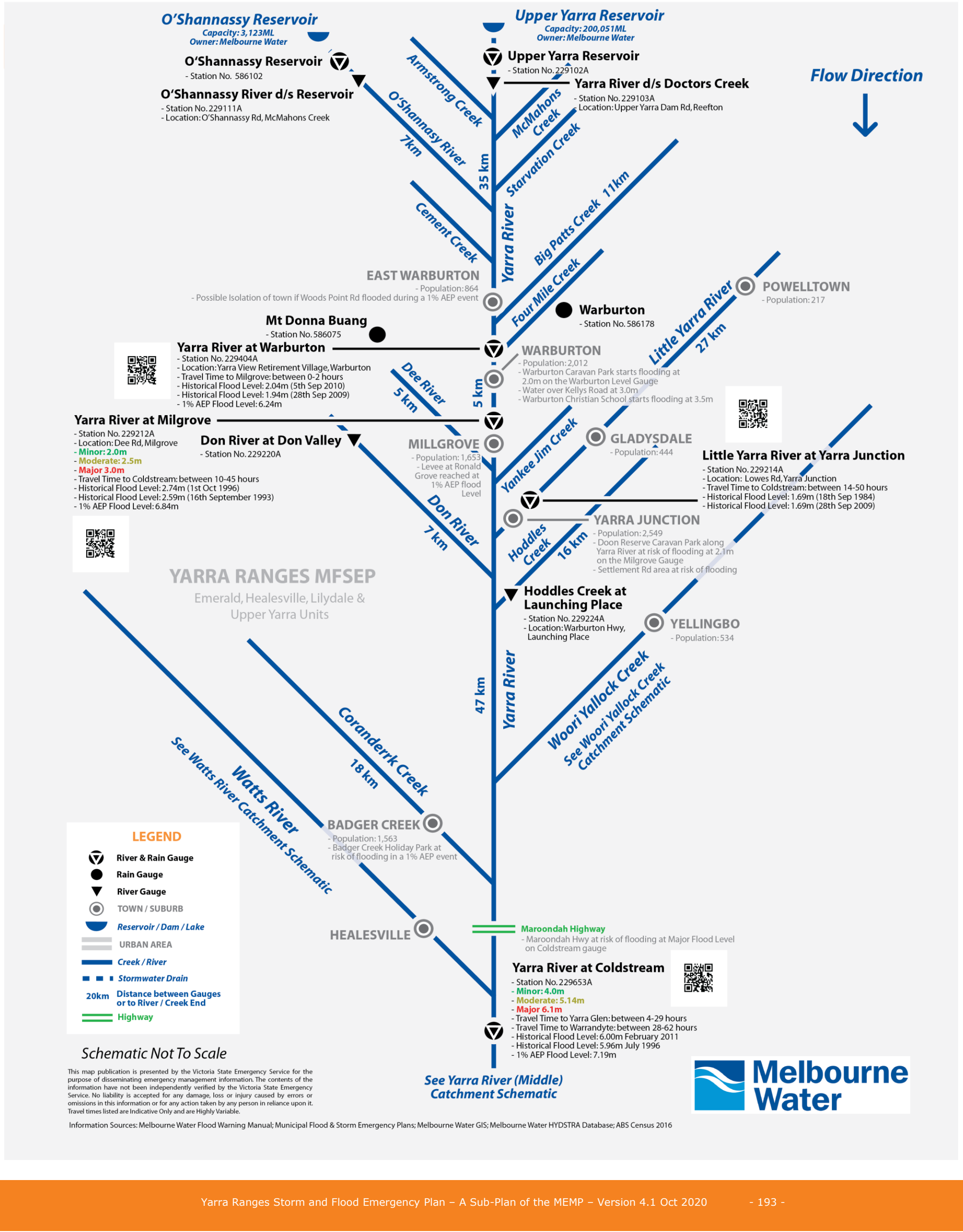
Severe Weather RFAs (Storm or Flood)
(By Month > 250 Requests Received)

August 2009	(757)	August 2013	(315)
August 2010	(266)	June 2014	(282)
September 2010	(301)	July 2014	(294)
December 2010	(315)	September 2014	(342)
February 2011	(409)	May 2016	(318)
November 2011	(270)	October 2016	(1055)
September 2012	(363)	August 2020	(712)

Catchment Schematics

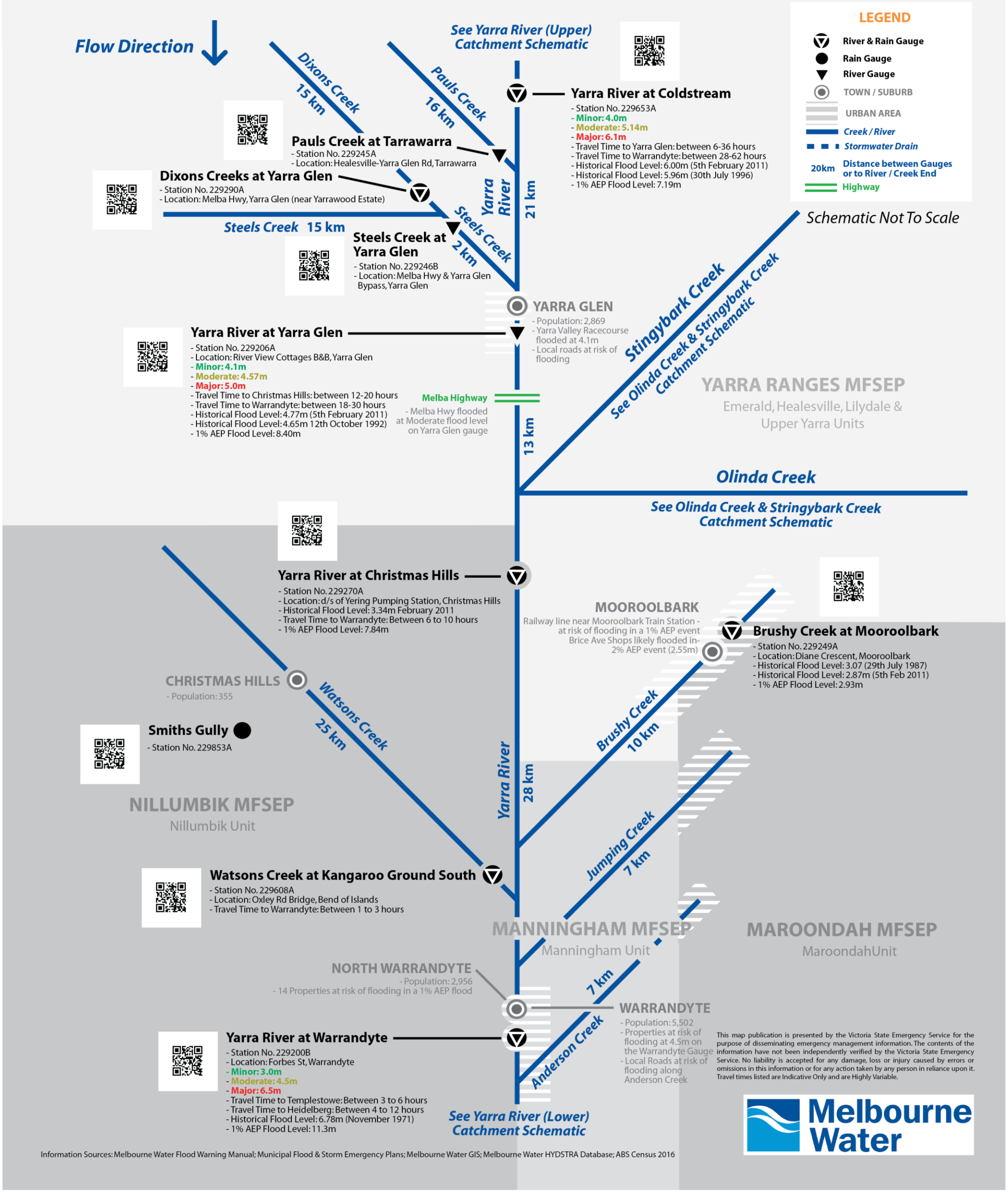
Yarra River (Upper) Catchment Schematic

Version 3 - September 2020



Yarra River (Middle) Catchment Schematic

Version 6 - September 2020



Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood & Storm Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

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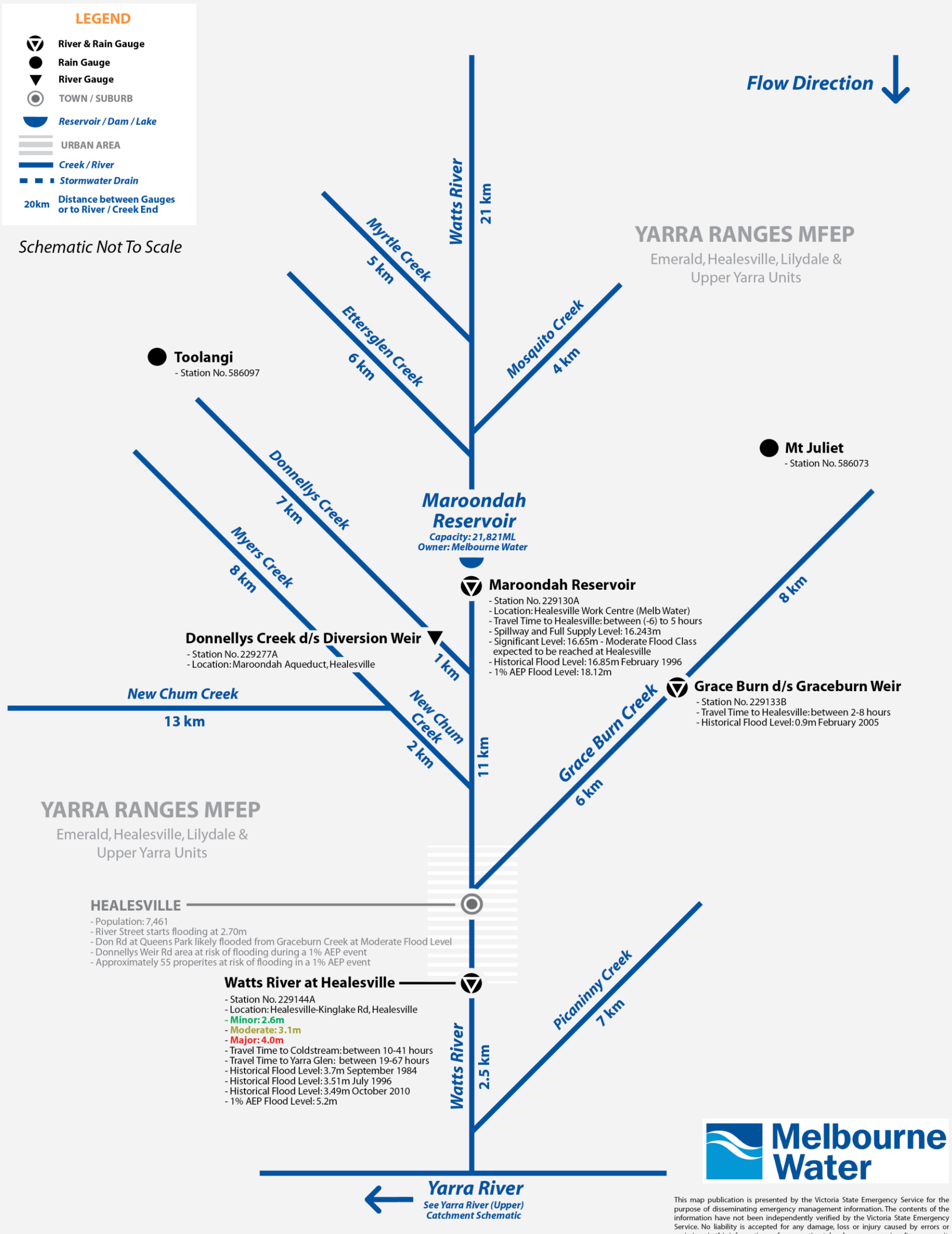
Melbourne Water

Watts River Catchment Schematic

Version 3 - September 2020

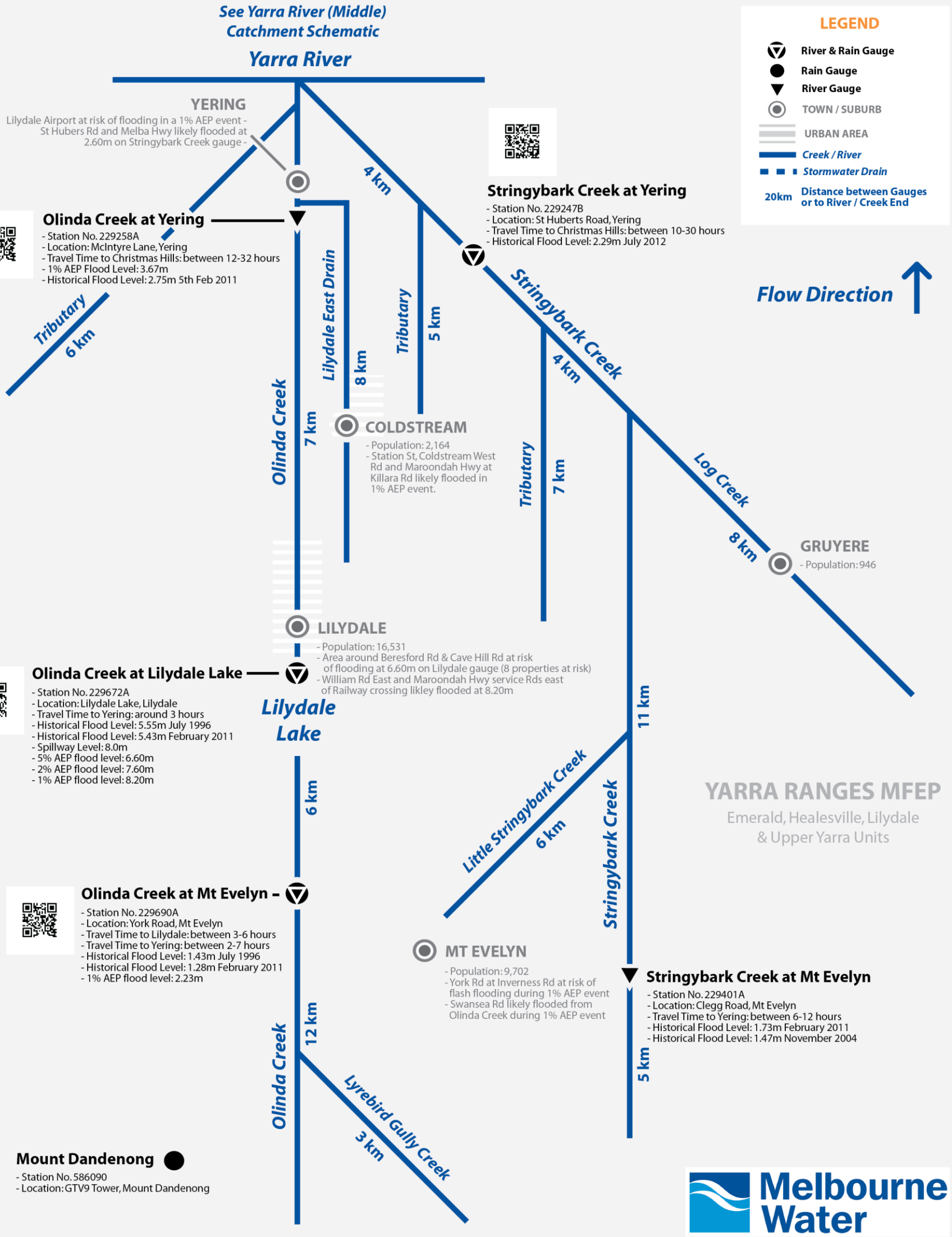


Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood & Storm Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

Melbourne Water

Olinda Creek & Stringybark Creek Catchment Schematic

Version 3 - September 2020

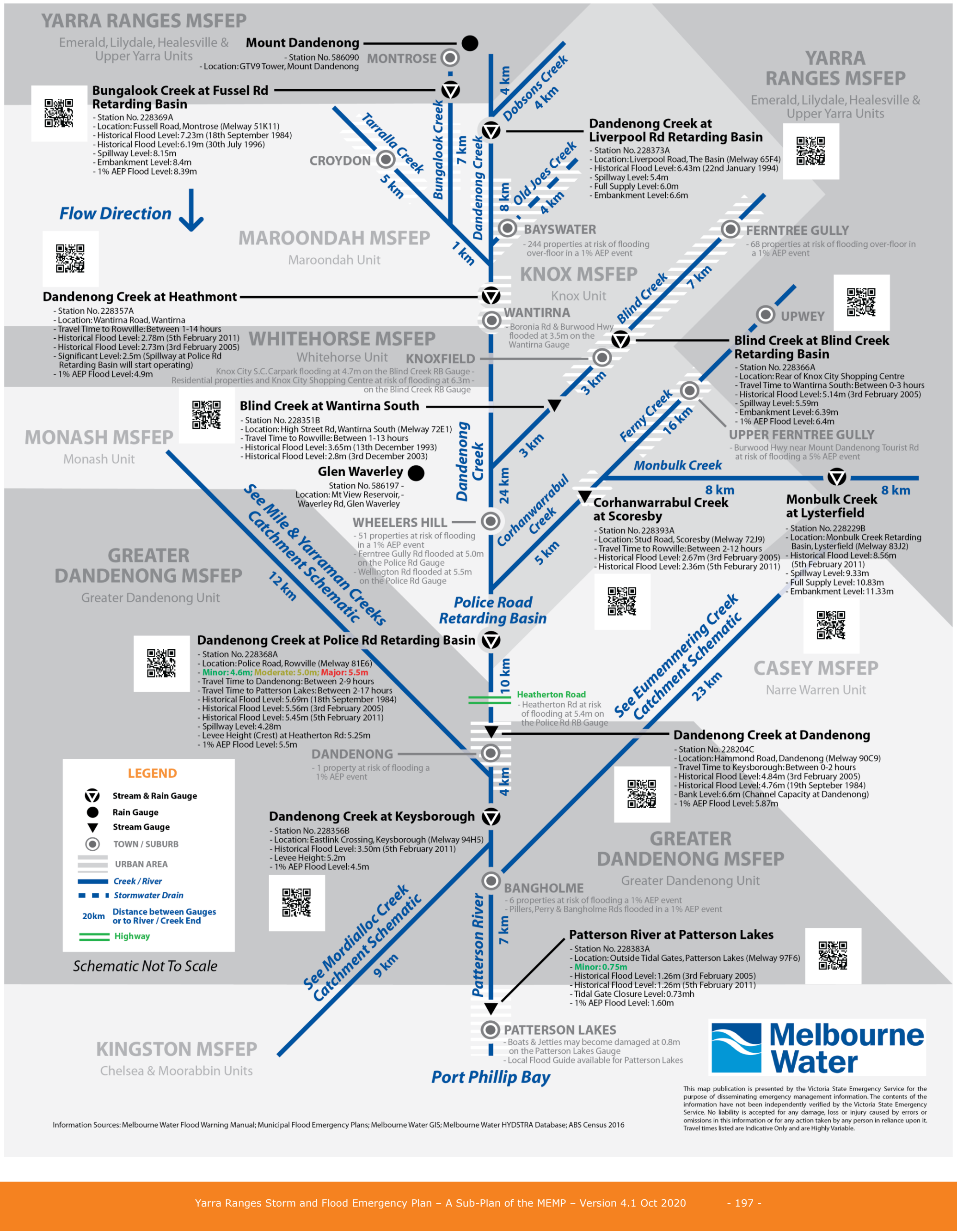


Schematic Not To Scale

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood & Storm Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

Dandenong Creek Catchment Schematic

Version 8 - September 2020



Melbourne Water

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Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

Woori Yallock Creek Catchment Schematic

Version 3 - September 2020

Melbourne Water

See Yarra River (Upper) Catchment Schematic

Yarra River

Flow Direction

LEGEND

- River & Rain Gauge
- Rain Gauge
- River Gauge
- TOWN / SUBURB
- URBAN AREA
- Creek / River
- Stormwater Drain
- 20km — Distance between Gauges or to River / Creek End

Schematic Not To Scale

10 km

WOORI YALLOCK
- Population: 2,913

4 km

Wandin Yallock Creek at Seville East
- Station No. 229681B
- Location: Chandler Road, Seville East
- Historical Flood Level: 3.49m February 2011
- 1% AEP Flood Level: 2.83m

SEVILLE EAST
- Population: 797

Woori Yallock Creek at Woori Yallock
- Station No. 229215B
- Location: Warburton Trail overpass, Woori Yallock
- Travel Time to Coldstream: between 12-20 hours
- Historical Flood Level: 3.37m February 2011
- Historical Flood Level: 2.85m June 1989

Wild Cattle Creek

4 km

WANDIN NORTH
- Population: 3,051

SEVILLE
- Population: 2,378
- Warburton Hwy, Britton Rd & Seymour St at risk of flooding during a 1% AEP event

Woori Yallock Creek

15 km

Wandin Yallock Creek

12 km

YARRA RANGES MFSEP

Emerald, Healesville, Lilydale & Upper Yarra Units

SILVAN
- Population: 1,246

Woori Yallock Creek at Yellingbo
- Station No. 229679B
- Location: Parslows Road, Yellingbo
- Travel Time to Woori Yallock: between 1-12 hours
- Historical Flood Level: 3.7m February 2011

YELLINGBO
- Population: 534

Sheep Station Creek

10 km

1 km

McCrae Creek at Yellingbo
- Station No. 229678A
- Location: Melway 306 A11
- Historical Flood Level: 1.67m February 2011

Ferndale Creek

6 km

Cockatoo Creek

12 km

McCrae Creek

21 km

Hansen Creek

5 km

Woori Yallock Creek at Old Emerald Road, Monbulk
- Station No. 229694B
- Location: Old Emerald Road, Monbulk
- Travel Time to Yellingbo: between 0-4 hours
- Historical Flood Level: 2.19m February 2011
- Historical Flood Level: 2.12m February 2005

Woori Yallock Creek

19 km

Macclesfield Creek

9 km

2 km

Shepherd Creek at Nangana
- Station No. 229677B
- Location: Healesville-Koo Wee Rup Road, Nangana
- Travel Time to Yellingbo: between 2-3 hours
- Historical Flood Level: 2.18m (3rd February 2005)

Emerald Creek

7 km

MONBULK
- Population: 3,577

Cockatoo Creek at Tschampions Road
- Station No. 229248B
- Location: Tschampions Road, Macclesfield
- Historical Flood Level: 2.51m (5th February 2011)

Shepherd Creek

5 km

Sassafras Creek

11 km

Menzies Creek

8 km

Cockatoo Creek

20 km

Pancake Creek

8 km

Beenak
- Station No. 586195

Tomahawk Creek

11 km

CARDINIA MFSEP

Emerald & Pakenham Units

Wattle Creek

4 km

COCKATOO
- Population: 4,256

Shephard Creek West Branch

6 km

Shephard Creek East Branch

7 km

EMERALD
- Population: 5,778

Emerald (Cardinia Reservoir)
- Station No. 586033

GEMBROOK
- Population: 2,350

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood & Storm Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

APPENDIX G - SEVERE WEATHER (STORM) EVENTS

Overview

Storm events in the Yarra Ranges Municipality may be subject to include wind storms, dust storms, hailstorms, and thunderstorms (including lightning activity). Flash flooding events are a relatively common occurrence with the greatest inconvenience being short term delays on roadways. Greater property damage may occur when flash flooding occurs in conjunction with damaging winds. In the Yarra Ranges municipality is susceptible to severe weather events because of a combination of its undulating terrain, high number of mature trees located within the municipality, substantial parkland areas.

Severe storm activity could result in injuries and an increase in road accidents. Damaging wind events will tend to lead to trees down, with damage to the built and natural environment. Obstructions across roads could disrupt services, affect community functioning and have great potential for road traffic delays. Financial loss and temporary displacement of Yarra Ranges residents may occur as a result of property damage.

This Appendix uses Request for Assistance data from the Victoria State Emergency Service (VICSES) to display areas at risk from severe weather events

Large Storm Events

Typically, the Lilydale, Healesville, Upper Yarra and Emerald units would expect to be impacted by a large storm event between one and three times per year (more than 250 RFA's per day combined across the four units).

Since 2009 the following larger storm events have occurred in the Shire of Yarra Ranges:

- August 2009 that saw **757** requests for help received, particularly around Chirnside Park, Mooroolbark, Lilydale and Mount Evelyn
- February 2011 – Heavy rain and storm event that saw **409** RFA's received mainly for flash flooding and building damage.
- October 2016 – Flood and storm event which saw **1,055** RFA's received, coinciding with major floods impacting Victoria across the state (biggest flood event since 2011).
- August 2020 – Short duration wind storm that brought down many trees resulting in **712** requests for help

VICSES Requests for Assistance (RFAs)

The Victoria State Emergency Service records requests for assistance made by the public during severe weather events. Table G1 below is a breakdown of requests by suburb and damage type during the period July 2009 and August 2020.

VICSES Request for Assistance (July 2009 – August 2020)					
Suburb	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other *
Badger Creek	25	7	86	131	1
Beenak	2	0	0	9	0
Belgrave	193	19	398	327	2
Belgrave Heights	56	6	96	80	0
Belgrave South	30	6	72	128	0
Big Pats Creek	3	0	2	4	0
Cambarville	1	0	1	34	0
Castella	0	0	3	16	0
Chirnside Park	145	37	151	101	1
Chum Creek	19	15	67	180	1
Clematis	0	0	0	3	0
Coldstream	9	23	44	122	1
Dixons Creek	2	1	11	103	8
Don Valley	12	3	37	69	0
East Warburton	12	1	37	67	4
Emerald	7	0	43	68	0
Fernshaw	0	0	6	196	1
Ferny Creek	46	9	133	173	2
Gembrook	0	0	0	2	0
Gilderoy	0	0	2	12	0
Gladysdale	3	0	13	42	0
Gruyere	7	3	39	120	0
Harkaway	0	0	1	2	0
Healesville	105	67	335	777	6
Hoddles Creek	1	1	35	86	0
Kallista	44	6	129	326	0
Kalorama	58	2	125	199	4
Kilsyth	82	21	182	130	1
Launching Place	35	5	99	163	3
Lilydale	206	55	320	322	2
Lysterfield	0	1	7	47	0
Macclesfield	6	0	44	153	0
Mcmahons Creek	1	2	8	26	2
Menzies Creek	20	2	62	163	0
Millgrove	63	8	92	72	1
Monbulk	47	10	158	387	1
Montrose	108	13	343	408	1
Mooroolbark	191	49	375	181	5
Mount Dandenong	44	5	104	157	0
Mount Evelyn	228	17	543	425	3
Mount Toolebewong	2	0	9	22	0
Narre Warren East	2	1	17	87	0
Olinda	46	7	193	382	2
Powelltown	5	4	4	29	1

VICSES Request for Assistance (July 2009 – August 2020)					
Suburb	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other *
Reefton	5	0	2	18	0
Sassafras	39	5	90	213	1
Selby	65	2	162	237	1
Seville	29	11	66	188	0
Seville East	11	1	37	66	0
Sherbrooke	12	1	55	165	1
Silvan	5	0	38	92	0
Steels Creek	2	1	7	65	2
Tarrawarra	0	0	4	25	0
Tecoma	87	12	158	158	3
The Basin	0	0	1	9	0
The Patch	18	3	66	100	1
Three Bridges	3	0	11	27	0
Toolangi	0	0	19	109	1
Tremont	6	19	82	3	1
Upper Ferntree Gully	40	3	47	47	0
Upwey	259	27	467	285	2
Wandin East	8	1	14	29	0
Wandin North	40	14	93	114	2
Warburton	55	7	171	316	5
Wesburn	20	7	32	45	0
Wonga Park	2	2	6	6	0
Woori Yallock	31	4	63	124	0
Yarra Glen	28	12	40	75	2
Yarra Junction	36	15	95	128	3
Yellingbo	3	0	50	168	0
Yering	1	1	5	19	0

Table G1 – Breakdown of severe weather RFAs received by VICSES Lilydale, Healesville and Upper Yarra Units by suburb

*Assist Agency, Dam Incident, Fence Down, Landslide, Loose Debris / Objects, Rescue Persons Trapped, Rescue Structure Collapse, Rescue Vehicle into Structure and Sandbag Request

Table G2 is a breakdown of requests for assistance by Date (Month) and damage type.

Date	VICSES Request for Assistance (July 2009 – August 2020)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
July 2009	10	0	20	17	0
August 2009	229	1	311	216	0
September 2009	44	2	91	103	0
October 2009	8	3	10	13	0
November 2009	28	4	56	35	0
December 2009	9	1	17	20	0
January 2010	11	0	29	47	0
February 2010	6	1	25	37	0
March 2010	178	14	34	16	0
April 2010	9	0	11	13	0
May 2010	15	0	20	25	0
June 2010	33	0	79	95	0
July 2010	9	0	26	32	0
August 2010	25	0	82	159	0
September 2010	38	3	98	162	0
October 2010	23	31	49	90	0
November 2010	20	2	64	111	1
December 2010	22	51	86	156	0
January 2011	25	17	69	100	0
February 2011	52	143	84	126	4
March 2011	8	2	19	41	0
April 2011	9	3	11	34	0
May 2011	12	2	28	63	0
June 2011	16	1	69	103	0
July 2011	14	0	39	72	0
August 2011	5	0	12	24	0
September 2011	25	6	56	64	0
October 2011	12	10	36	55	0
November 2011	32	35	87	116	0
December 2011	10	4	36	52	0
January 2012	33	0	71	72	0
February 2012	39	10	89	87	0
March 2012	28	1	88	86	0
April 2012	12	3	17	34	0
May 2012	10	0	29	54	0
June 2012	33	0	57	92	0
July 2012	13	7	29	48	0
August 2012	20	0	30	90	0
September 2012	64	0	140	158	1
October 2012	3	0	14	21	0
November 2012	6	2	12	29	0
December 2012	15	0	54	65	0
January 2013	7	0	21	31	0
February 2013	10	0	24	34	0
March 2013	33	0	69	82	0
April 3013	4	0	15	21	0
May 2013	10	0	20	21	0
June 2013	8	0	10	23	0
July 2013	10	1	22	53	0
August 2013	38	0	85	192	0
September 2013	41	1	76	91	0
October 2013	41	0	108	94	0
November 2013	4	0	23	44	0
December 2013	10	2	31	50	0
January 2014	15	0	46	80	0
February 2014	13	4	43	54	0
March 2014	9	0	17	23	0
April 2014	5	1	15	37	0
May 2014	6	0	12	36	0
June 2014	42	0	100	140	0

Date	VICSES Request for Assistance (July 2009 – August 2020)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
July 2014	30	3	84	177	0
August 2014	10	0	29	33	0
September 2014	58	4	109	171	0
October 2014	10	0	32	49	0
November 2014	6	0	22	41	0
December 2014	7	0	48	61	0
January 2015	14	0	50	65	0
February 2015	22	5	39	85	1
March 2015	14	0	65	48	0
April 2015	2	0	8	20	0
May 2015	15	1	29	53	0
June 2015	2	0	16	23	0
July 2015	12	1	18	56	0
August 2015	6	6	11	59	0
September 2015	1	0	13	23	0
October 2015	15	1	33	27	0
November 2015	26	0	63	68	0
December 2015	10	0	52	65	0
January 2016	21	8	54	64	0
February 2016	2	0	19	33	0
March 2016	18	1	40	74	0
April 2016	3	0	8	19	0
May 2016	54	2	114	148	0
June 2016	11	1	28	73	0
July 2016	25	1	57	98	0
August 2016	9	0	22	55	0
September 2016	8	2	9	54	0
October 2016	210	4	396	444	1
November 2016	7	0	22	39	0
December 2016	31	31	30	70	1
January 2017	10	2	23	42	0
February 2017	11	6	28	41	0
March 2017	17	4	33	56	0
April 2017	3	0	16	28	0
May 2017	4	0	6	10	0
June 2017	2	0	1	10	0
July 2017	10	0	16	48	0
August 2017	9	1	19	55	1
September 2017	14	1	18	54	0
October 2017	4	1	5	15	0
November 2017	5	0	12	42	0
December 2017	26	22	45	87	2
January 2018	9	1	27	52	0
February 2018	24	0	78	108	0
March 2018	5	0	27	51	0
April 2018	8	1	10	29	0
May 2018	3	0	18	42	0
June 2018	6	2	21	65	0
July 2018	25	0	41	77	0
August 2018	16	2	46	101	0
September 2018	3	0	9	21	0
October 2018	4	0	8	26	0
November 2018	25	10	18	66	2
December 2018	9	0	28	93	0
January 2019	8	0	30	91	0
February 2019	2	0	18	44	0
March 2019	21	4	28	74	0
April 2019	6	2	8	31	1
May 2019	11	1	16	58	5
June 2019	3	1	12	44	4
July 2019	24	3	52	144	0
August 2019	17	2	50	129	2

Date	VICSES Request for Assistance (July 2009 – August 2020)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
September 2019	15	2	53	130	1
October 2019	4	1	23	44	1
November 2019	21	2	75	118	4
December 2019	4	1	38	64	1
January 2020	13	10	75	104	6
February 2020	7	3	64	102	1
March 2020	5	3	24	51	0
April 2020	11	8	70	77	2
May 2020	11	6	54	87	0
June 2020	5	4	27	43	5
July 2020	4	3	26	57	3
August 2020	45	5	374	277	11

Table G2 – Breakdown of severe weather RFAs received by VICSES Maroondah Unit by month

*Assist Agency, Dam Incident, Fence Down, Landslide, Loose Debris / Objects, Rescue Persons Trapped, Rescue Structure Collapse, Rescue Vehicle into Structure and Sandbag Request