SES

City of Casey

Storm and Flood Emergency Plan

A Sub-Plan of the Municipal Emergency Management Plan

For Casey Council
And
VICSES Narre Warren Unit

Version 3.0 February 2018

FloodSafe

City of Casey

VICTORIA State Government

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Document Transmittal Form / Amendment Certificate

This Municipal Storm and Flood Emergency Plan (MSFEP) will be amended, maintained and distributed as required by VICSES in consultation with the City of Casey

Suggestions for amendments to this Plan should be forwarded to VICSES Central Regional Office, Unit 6, 3 – 5 Gilda Court, Mulgrave 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
1.0	June 2012	Matthew Taranto	Population of Template
1.1	December 2012	Matthew Taranto	Update of template with SES amendments
1.2	April 2013	Matthew Taranto	Further SES amendments added and layout changes
2.0	November 2014	Ross Butler	Updated Appendix A, B, C, F and addition of Appendix G
2.1	July 2017	Gerry Sheridan	Update legislative references, acronyms, inclusion of operational information
3.0	February 2018	Ross Butler	Updated Appendix A, B, C, F & G

List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan:

AEP	Annual Exceedance Probability
AHD	Australian Height Datum (the height of a location above mean sea level in metres)
AIIMS	Australasian Inter-service Incident Management System
AoCC	Area of Operations Control Centre / Command Centre
ARI	Average Recurrence Interval
AAR	After Action Review
AV	Ambulance Victoria
BoM	Bureau of Meteorology
CEO	Chief Executive Officer
CEP	Community Education Plan
CERA	Community Emergency Risk Assessment
CFA	Country Fire Authority
CMA	Catchment Management Authority
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
DHHS	Department of Health and Human Services
EA	Emergency Alert
EMLO	Emergency Management Liaison
EMMV	Emergency Management Manual Victoria
EMT	Emergency Management Team
EO	Executive Officer
FWS	Flood Warning System
IC	Incident Controller
ICC	Incident Control Centre
IERC	Incident Emergency Response Coordinator
IMT	Incident Management Team
IMS	Incident Management System
LSIO	Land Subject to Inundation Overlay
MECC	Municipal Emergency Coordination Centre
MEMP	Municipal Emergency Management Plan
MEMPC	Municipal Emergency Management Planning Committee
MERC	Municipal Emergency Response Coordinator
MERO	Municipal Emergency Resource Officer
MFB	Metropolitan Fire and Emergency Services Board
MSFEP	Municipal Storm And Flood Emergency Plan
MFPC	Municipal Flood Planning Committee
MRM	Municipal Recovery Manager
PMF	Probable Maximum Flood
RCC	Regional Control Centre
RERC	Regional Emergency Response Coordinator
RERCC	Regional Emergency Response Coordination Centre
SBO	Special Building Overlay
SCC	State Control Centre
SEWS	Standard Emergency Warning System
SHERP	State Health Emergency Response Plan
SOP	Standard Operating Procedure
VicPol	Victoria Police
VICSES	Victoria State Emergency Service

AEP	Annual Exceedance Probability
AHD	Australian Height Datum (the height of a location above mean sea level in metres)
AIIMS	Australasian Inter-service Incident Management System
ARI	Average Recurrence Interval
ARMCANZ	Agricultural & Resource Management Council of Australia & New Zealand
AV	Ambulance Victoria
BoM	Bureau of Meteorology
CEO	Chief Executive Officer
CERM	Community Emergency Risk Management
CFA	Country Fire Authority
CMA	Catchment Management Authority
RERC	Regional Emergency Response Coordinator
RERCC	Regional Emergency Response Coordination Centre
DHS	Department of Human Services
DELWP	Department of Environment, Land, Water & Planning
EMMV	Emergency Management Manual Victoria
EMT	Emergency Management Team
EO	Executive Officer
FO	Floodway Overlay
FWS	Flood Warning System
FZ	Floodway Zone
IC	Incident Controller
ICC	Incident Control Centre
IMT	Incident Management Team
IMS	Incident Management System
EMLO	Emergency Management Liaison Officer
LSIO	Land Subject to Inundation Overlay
MECC	Municipal Emergency Coordination Centre
MEMP	Municipal Emergency Management Plan
MEMPC	Municipal Emergency Management Planning Committee
MERC	Municipal Emergency Response Coordinator
MERO	Municipal Emergency Resource Officer
MFB	Metropolitan Fire and Emergency Services Board
MRM	Municipal Recovery Manager
PMF	Probable Maximum Flood
RCC	Regional Control Centre
RDO	Regional Duty Officer
SBO	Special Building Overlay
SCC	State Control Centre
SEWS	Standard Emergency Warning System
SHERP	State Health Emergency Response Plan
SOP	Standard Operating Procedure
VicPol	Victoria Police
VICSES	Victoria State Emergency Service

Part 1. INTRODUCTION

1.1 Municipal Endorsement

This Municipal Storm and Flood Emergency Plan (MSFEP) has been prepared by the City of Casey and with the authority of the Casey Municipal Emergency Management Planning Committee pursuant to Section 20 of the Emergency Management Act 1986 (as amended).

This MSFEP is a sub plan to the City of Casey Municipal Emergency Management Plan (MEMP), is consistent with the Emergency Management Manual Victoria (EMMV) and the Victoria Flood Management Strategy (DNRE, 1998a), and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC).

The Municipal Flood Emergency Plan is consistent with the Regional Flood Emergency Plan and the State Flood Emergency Plan.

This Municipal Flood Emergency Plan is a result of the cooperative efforts of the Casey Storm and Flood Planning Committee (MSFPC) and its member agencies.

This Plan is endorsed by the City of Casey MEMPC as a sub-plan to the MEMP.

Endorsement

…….. Steve Coldham, Chair of MEMPC Date Director of Emergency Management …….. Ray Jasper Date Regional Manager VICSES Central Region

1.2 The Municipality

An outline of City of Casey in terms of its location, demography and other general matters is provided in the MEMP. An outline of the flood threat is provided in **Appendix A** of this Plan.

1.3 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 City of Casey

As such, the scope of the Plan is to:

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

1.4 Municipal Storm and Flood Planning Committee (MSFPC)

Membership of the Casey Storm and Flood Planning Committee (MSFPC) will comprise of the following representatives from the following agencies and organisations:

- VICSES (Regional Officer Emergency Management, Unit Controller) **(Chair)**,
- MERO City of Casey,
- MRM City of Casey,
- Drainage Management Team – City of Casey
- Victoria Police (MERC),
- Floodplain Services Team - Melbourne Water
- Other agencies co-opted as required

1.5 Responsibility for Planning, Review & Maintenance of this Plan

This MSFEP must be maintained in order to remain effective.

VICSES through the MEMPC has responsibility for preparing, reviewing, maintaining and distributing this plan.

The MEMPC may delegate to a sub-committee and meet at least once per year.

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;

After the occurrence of a significant storm and/or flood event within the Municipality

1.6 Endorsement of the Plan

The MSFEP is endorsed by the MEMPC as a sub-plan of the MEMPlan. The MSFEP will be circulated to MSFPC members seeking acceptance of the plan following any large changes to the plan.

Part 2. PREVENTION / PREPAREDNESS ARRANGEMENTS

2.1 Community Awareness for all Types of Storm and Flooding

Relevant details of this MSFEP will be released to the community through:

- VICSES with the support of City of Casey and Melbourne Water will coordinate community education programs for flooding within the council area. E.g. FloodSafe / StormSafe.
- A Community Education Plan (CEP) to support this plan will be developed in conjunction with VICSES local units. VICSES local units will lead the delivery of the CEP with support from City of Casey and VICSES Central 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, within the life of the MEMPlan.

2.3.2 Storm and Flood Warning

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

2.3.3 Flood Wardens (Flood Observers)

There are currently no Flood Wardens or Observers within the City of Casey; 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. RESPONSE ARRANGEMENTS

3.1 Introduction

3.1.1 Activation of Response

Storm and Flood response arrangements may be activated by the VICSES Central Region RDO or IC.

The RDO / IC will activate agencies as required and documented in the VICSES Central Region and State Storm Emergency Plan and 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 City of Casey. These agencies will be engaged through the EMT.

The general roles and responsibilities of supporting agencies are as agreed within the Casey MEMP, EMMV (Part 7 'Emergency Management Agency Roles'), VICSES Central Region Flood Emergency Plan and State Flood and Storm Emergency Plans.(see https://www.ses.vic.gov.au/em-sector/vicses-emergency-plans).Municipal Emergency Coordination Centre (MECC)

Where activated, the function, location, establishment and operation of the MECC (or similar coordination centre) will be as detailed in the City of Casey MEMP.

Liaison with the MECC will be through the VICSES Central Region RDO / IC or established ICC.

In the event that a MECC is not operating City of Casey MERO will be contacted.

3.1.3 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.

3.2 Strategic Emergency Management Priorities

To provide guidance to the Incident Management Team (IMT) and Incident Emergency Management Team (IEMT), the following strategic emergency management priorities shall form the basis of incident action planning processes:

1. Protection and preservation of life is paramount - this includes:

    a. Safety of emergency services personnel, and;

    b. Safety of community members including vulnerable community members and visitors/tourist located within the incident area.

2. Issuing of community information and community warnings detailing incident information that is timely, relevant and tailored to assist community members make informed decisions about their safety.;

3. Protection of critical infrastructure and community assets that supports community resilience;

4. Protection of residential property as a place of primary residence;

5. Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability

6. Protection of environmental and conservation values that considers the cultural, biodiversity, and social values of the environment;

Circumstances may arise where the Incident Controller is required to vary these priorities, with the exception being that the protection of life should remain the highest. This shall be done in consultation with the State Response Controller and relevant stakeholders based on sound incident predictions and risk assessments.

3.3 Command, Control & Coordination

The Command, Control and Coordination arrangements in this MSFEP must be consistent with those detailed in the VICSES Central Region Storm and Flood Emergency Plans and State Storm and Flood Emergency Plans. For further information, refer to Part 3 of the EMMV.

The specific details of the Command, Control and Coordination arrangements for this plan are to be provided in **Appendix C** where appropriate.

3.3.1 Control

Sections 5 (1) (a) and 5(c) of *the Victoria State Emergency Service Act 2005(* detail the authority for VICSES to plan for and respond to storm and flood.

Part 7 of the EMMV identifies VICSES as the Control Agency for storm and flood. It identifies DELWP as the Control Agency responsible for dam safety as well as water and waste water service disruption related incidents and other emergencies.

All flood response activities within the City of Casey including those arising from a dam failure or retarding basin / levee bank failure incident will therefore be under the control of the appointed Incident Controller, or his / her delegated representative.

3.3.2 Incident Controller (IC)

An Incident Controller (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 storm and/or flood event will occur or is occurring. The Incident Controller responsibilities are as defined in Part 3 of the EMMV

3.3.3 Incident Control Centre (ICC)

As required, the Incident Controller will establish an Incident Control Centre (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).

- Dandenong ICC
- Ferntree Gully ICC

3.3.4 Divisions and Sectors

To ensure that effective Command and Control are in place, the Incident Controller 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.

Predetermined Divisional Command Locations may include:

- Pakenham Unit LHQ
- Emerald LCF (CFA)

Sector Command locations are allocated on an as needs basis.

3.3.5 Incident Management Team (IMT)

The Incident Controller will form an Incident Management Team (IMT) in line with AIIMS principals.

Refer to 3 of the EMMV for guidance on IMTs.

3.3.6 Incident Emergency Management Team (IEMT)

The Incident Controller will establish a multi-agency Incident Emergency Management Team (IEMT) to assist the storm and 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 Incident Controller for consideration in developing incident management strategies.

Organisations, required within the IEMT (including City of Casey) will provide an Emergency Management Liaison Officer (EMLO) / Agency Commander 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 3 of the EMMV for guidance on IEMTs.

3.3.7 On Receipt of a Flood Watch / Severe Weather Warning

The IC /VICSES RDO 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 – 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 Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Council (as outlined in the City of Casey MEMP), other emergency services through the IEMT.
- Assess ICC readiness (including staffing of IMT and IEMT) 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

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

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

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters, rising, peaking or falling?
- Review storm and 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

What areas may be at risk of building damage

    - The characteristics of the populations at risk
- Determine what the at-risk community need to know and do as the storm and/or flood develops.
- Warn the at-risk community including ensuring that an appropriate warning and community information strategy is implemented including details of:
    - The current storm and/or flood situation
    - Storm and/or flood predictions
    - What the consequences of predicted levels may be
    - Public safety advice

- Who to contact for further information
- 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/or flood consequence assessment.
- Continue to monitor the storm/flood situation – www.bom.gov.au/
- Continue to conduct reconnaissance of low-lying areas

3.4 Community Information and Warnings

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

Community information and warnings communication methods available may include:

- 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;
- Social media and/or social networking sites (i.e. twitter and/or facebook).

Refer to Appendix C and 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. City of Casey 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 landslide 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.

3.5 Media Communication

The IC through the Information Unit established at the ICC will manage Media communication. If the ICC is not established the RDO will manage all media communication. City of Casey will work with the IC to ensure that consistent and timely messaging occurs.

3.6 Impact assessment

An impact assessment can be conducted in accordance with Part 3 of the EMMV 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 further needs assessment and recovery planning by council and DHHS and applicable 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 are outlined in the State Flood Emergency Plan. All IAs should be conducted in accordance with Part 3 of the EMMV.

3.7 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 City of Casey MEMP.

3.8 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 Storm Emergency Plan 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, resources available etc.

2. Should evacuation be the adopted strategy 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 page 3 of MEMP Part 5);

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;

4. For buildings known to be structurally un-suitable an earlier evacuation trigger will need to be established (return to step 1 of this cycle).

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.

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).

3.9 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 EMT.

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 EMMV, Part 3 of the EMMV and the City of Casey Relief and Recovery section of the MEMP for guidance on evacuations for flood emergencies. If evacuation is determined as appropriate, City of Casey should be notified.

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

3.10 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.

3.11 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 Incident Controller in line with State Aircraft Unit Policy 01-Air Operations.

3.12 Resupply

Communities, neighbourhoods or households can become isolated during 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, VICSES will advise businesses and/or households that they should stock up on essential items.

After the impact, VICSES can support isolated communities through assisting 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 with VICSES working with the relief agencies to service communities that are isolated.

3.13 Essential Infrastructure and Property Protection

Essential Infrastructure and Property (e.g. residences, businesses, roads, power supply etc.) may be affected in the event of a storm/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 City of Casey maintains a small stock of sandbags, and back-up supplies are available through the VICSES Regional Headquarters. The Incident Controller will determine the priorities related the use of sandbags, which will be consistent with the State Emergency Management Priorities and VICSES Sandbagging policy..

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of Essential Infrastructure. Other high priorities may include for example the protection of historical buildings.

Property may be protected by:

- Sandbagging to minimise entry of water into buildings
- Encouraging businesses and households to lift or move contents
- Construction of temporary levees in consultation with the CMA, LGA and VICPOL and within appropriate approval frameworks.

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

3.14 Disruption to Services

Disruption to services other than essential infrastructure and property can occur in storm and/or flood events. Refer to appendix C for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in the City of Casey.

3.15 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.

3.16 Road Closures

The City of Casey, VicPol and VicRoads will carry out their formal functions of road closures. This includes observation and placement of warning signs, road blocks to its designated local and regional roads, bridges, walking and bike trails. VicPol may liaise with and advise City of Casey and VicRoads of the need to erect warning assigns and/or for closure of roads and bridges. VicRoads are responsible for designated main roads and highways and the City of Casey are responsible for the designated local and regional road network.

VicRoads, VicPol and City of Casey will communicate community information regarding road closures and openings.

3.17 Dam Failure

DELWP 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**.

3.18 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 the responsible agency for the critical sewerage asset should undertake the following:

- Advise VICSES 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;
- Advise the ICC in the event of inundation of critical sewerage assets.

It is the responsibility of the City of Casey Environmental Health Officer to inspect and report to the MERO and the ICC on any water quality issues relating to flooding.

General Public Health information and messages are provided by the City of Casey 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.

3.19 After Action Review

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

All agencies involved in the storm and/or flood incident should be represented at the After Action Review.

Part 4. EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS

4.1 General

Arrangements for emergency relief and recovery from any emergency, including storm/flood incidents within the City of Casey is detailed in the Casey MEMP.

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 EMMV. 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 EMMV). These should be carried out in line with the City of Casey MEMP.

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 storm/flood. Refer to Section 4 of the EMMV for further information.

Suitable relief facilities identified for use during storm/floods are detailed in **Appendix D** and the MEMP.

Details of the relief arrangements are available in the City of Casey MEMPlan.

4.3 Animal Welfare

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

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 to be referred to DEDJTR.

Matters relating to the welfare of wildlife are to be referred to DELWP.

4.4 Transition from Response to Recovery

VICSES as the Control Agency is responsible for ensuring effective transition from response to recovery.

Transition should be done in consultation with emergency management teams (including IEMT and MRM). Further information about transition is provided in the EMMV Part 4 and the City of Casey MEMP.

APPENDIX A - FLOOD THREATS FOR CITY OF CASEY

GENERAL

The City of Casey is located 28-60km south east of the Melbourne CBD and covers a land area of approximately 410km^2. A large and diverse municipality, Casey has a population of over 281,000 (as at June 2014) with further growth expected in coming years.

The City includes the suburbs of Beaconsfield, Berwick, Blind Bight, Botanic Ridge, Cannons Creek, Clyde, Clyde North, Cranbourne, Cranbourne East, Cranbourne North, Cranbourne South, Cranbourne West, Devon Meadows, Doveton, Endeavour Hills, Eumemmering, Fountain Gate, Hallam, Hampton Park, Harkaway, Junction Village, Lynbrook, Lyndhurst, Lysterfield South, Narre Warren, Narre Warren South, Narre Warren North, Pearcedale, Tooradin and Warneet. Casey is bordered by the Cities of Knox and Yarra Ranges to the north, Cardinia to the east, Cities of Frankston and Greater Dandenong to the west, with the City of Mornington and Westernport Bay to the south.

Land at the northern and southern ends of the Municipality is predominantly rural and green wedge zoned, with most industrial, commercial and residential areas in the north-central part of the City.

The majority of the development within the City of Casey seen today is post 1970. During this period there have been advancements in drainage design techniques, standards and technologies as well as shifting community expectations. As a result, many of the older areas within the Municipality contain drainage infrastructure which does not meet today's standards

Around 14% of the City of Casey is geographically flood prone, based on flood mapping completed to date. Major contributors to this are developments on floodplains and in overland flow paths, old drainage systems designed to outdated standards and drainage systems that are under capacity as a result of increased housing density.

Most of the flooding in Casey is confined to natural waterways, man-made channels or roads. Unconfined flooding is a greater hazard to properties than confined flooding, as water that is unconfined will likely run into properties and roads situated at low lying points. Confined flooding areas are usually designated flood overlay zones, with building floor levels raised for protection. However, there is generally a greater safety risk through the confined flood channels due to the increased stormwater velocity.

RIVERINE FLOODING

Large severe floods within the Municipality 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.

FLASH FLOODING & 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.

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

TIDAL FLOODING & STORM SURGES

Moderate to heavy rainfall, coupled with a high or incoming tide from Westernport Bay can exacerbate flooding within the southern section of municipality or create areas of flooding in and around the drainage network. Due to the proximity of the Municipality to Westernport Bay and its flat terrain, tidal flows from Westernport Bay may reduce the capacity of the stormwater drains to discharge runoff back into the bay, while extreme storm events can cause backflow to the point where water surcharges back above ground around the drainage pits and channels.

MAJOR WATERWAYS & DRAINS

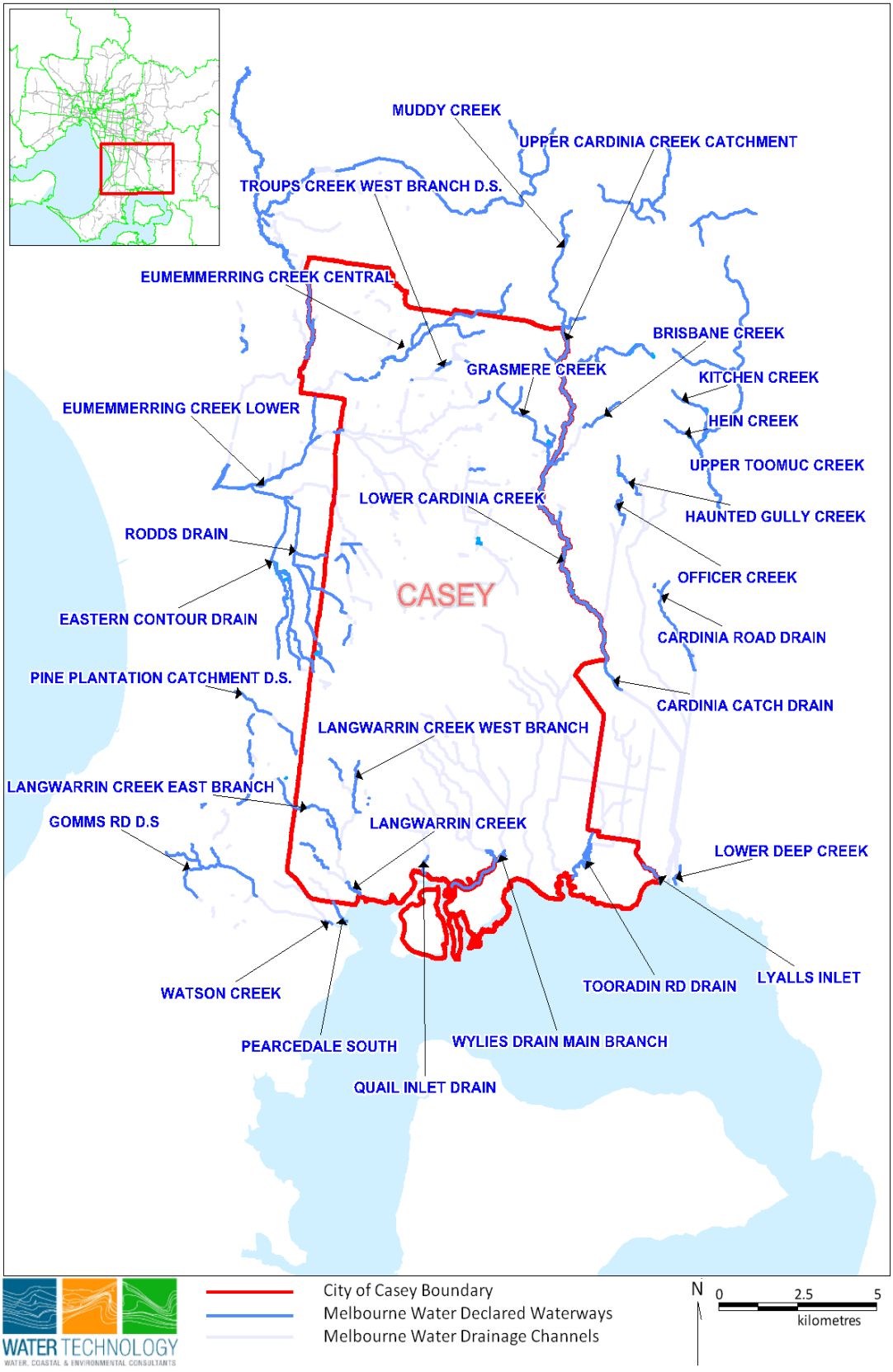

Figure A1 – Location of Major Waterways in City of Casey

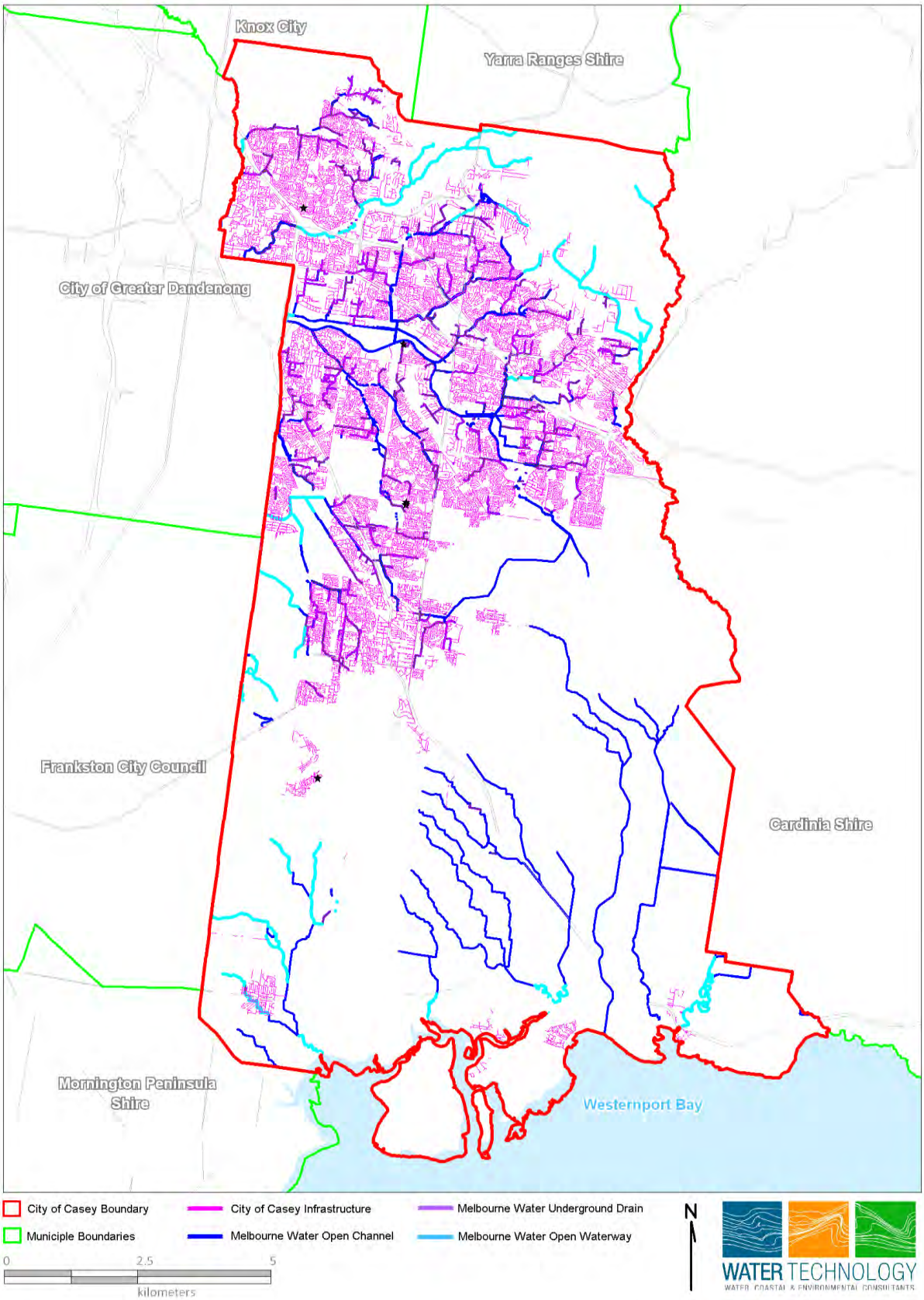

Figure A2 – Depiction of Channels & Drains within the City of Casey

Dandenong Creek

Dandenong Creek has headwaters in the foothills of the Dandenong Ranges near Olinda and flows west through Yarra Ranges Shire and forms the boundary separating the Cities of Maroondah and Knox. Dandenong Creek then continues south, forming the western border of City of Knox before entering the City of Casey east of Stud Road at Police Paddocks Reserve. Dandenong Creek flows through Endeavour Hills and Doveton, forming part of the north western boundary of Casey before exiting the municipality at Thomas Carroll Reserve in Doveton. After leaving the municipality, Dandenong creek converges with Eumemmering Creek to form Patterson River, which drains into Port Phillip Bay at Carrum.

Eumemmerring Creek

Eumemmering Creek is a natural waterway beginning in the Yarra Ranges Shire and entering the City of Casey at Belgrave-Hallam Road. Eumemmering Creek flows in a south westerly direction through Narre Warren North, Endeavour Hills, Hallam, Doveton and Eumemmering before exiting the Municipality at Princes Highway, Dandenong South where it continues in a south westerly direction before converging with Dandenong Creek at Bangholme to form Patterson River. Stormwater collected by the Hallam North Drainage System in residential areas of Endeavour Hills drains into Eumemmering Creek at Frog Hollow Reserve in Hallam.

Cardinia Creek

Cardinia Creek forms approx. 60% of the eastern boundary of Casey, entering the municipality approximately 2km downstream of Cardinia Reservoir and flowing south through Harkaway, Beaconsfield, Berwick and Clyde North before exiting the municipality at Chasemore Road, Cardinia. After leaving the Municipality, Cardinia Creek continues south through the Shire of Cardinia before discharging into Western Port Bay east of Tooradin.

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Beaconsfield Township Corridor	Beaconsfield, Berwick	Heatherton - Power Rd D.S.	Endeavour Hills, Doveton
Berwick South D.S.	Berwick, Narre Warren	Heatherton Rd East Drain	Narre Warren North
Berwick Township D.S.	Berwick	Homestead Rd Drain	Berwick, Narre Warren
Berwick West D.S.	Narre Warren, Berwick	Langridge Street Drain	Harkaway
Cardinia Creek (Lower)	Clyde North	Langwarrin Creek	Cranbourne South, Pearcedale
Cardinia Creek (upper)	Berwick, Harkaway	Lyndhurst North D.S.	Hampton Park, Lynbrook
Centre Rd Drain D.S.	Narre Warren	Lyndhurst South D.S.	Lynbrook, Lyndhurst, Cranbourne
Christies Drain	Cannons Creek, Devon Meadows	Manks Road Drain	Clyde
Clyde Creek	Clyde, Clyde North, Cranbourne East	Manuka Rd D.S.	Berwick
Cranbourne Central D.S.	Cranbourne	Monahans Rd D.S.	Cranbourne West, Cranbourne
Cranbourne East D.S.	Cranbourne, Cranbourne East	Muddy Gates Drain	Tooradin, Clyde
Cranbourne Outfall Drain	Lyndhurst, Cranbourne West	Muddy Gates Drain Central Branch	Clyde
Cranbourne South	Cranbourne South	Muddy Gates Drain East Branch	Clyde

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Dandenong Creek (Nth Dandenong)	Endeavour Hills, Doveton	Muddy Gates Drain West Branch	Clyde
Eastern contour drain	Cranbourne West	Narre Warren South	Narre Warren
Edrington Park D.S.	Berwick	Narre Warren Township D.S.	Berwick, Narre Warren
Essex Park D.S.	Endeavour Hills	O'Shea's Road D.S.	Berwick
Essex Park D.S. Extension	Endeavour Hills, Lysterfield South	Pearcedale South	Pearcedale
Eumemmerring Creek (Lower)	Doveton, Eumemmering	Princes Domain D.S.	Hallam
Eumemmerring Creek Central	Endeavour Hills, Hallam	Quail Inlet Drain	Canons Creek, Devon Meadows
Eumemmerring Creek (Upper)	Narre Warren North	Rockleigh Park D.S.	Narre Warren North
Fairbairn Rd D.S.	Cranbourne	Rodds Drain	Cranbourne West, Cranbourne
Fitzgerald Rd D.S.	Hallam	Rutters Road Drain	Clyde
Fordholm Rd East D.S.	Hampton Park	Ti-Tree Creek D.S.	Clyde North, Cranbourne East, Berwick, Narre Warren South
Golf Links Rd D.S.	Narre Warren	Tooradin Road Drain	Tooradin
Grasmere Creek	Berwick, Harkaway	Tooradin Inlet Drain	Tooradin
Greaves Rd D.S.	Narre Warren South	Troups Creek East Branch D.S.	Berwick, Narre Warren, Harkaway, Narre Warren North
Hallam North Rd D.S.	Narre Warren North, Endeavour Hills	Troups Creek West Branch D.S.	Narre Warren North, Harkaway, Hallam, Narre Warren
Hallam South D.S.	Hallam, Hampton Park	West Dalmore Road Drain	Tooradin
Hallam Valley	Hampton Park, Narre Warren South, Narre Warren	Western Outfall Drain	Tooradin
Hallam Valley D.S.	Narre Warren South	Wylies Drain Branch B	Clyde
Hampton Park East D.S.	Hampton Park	Wylies Drain Branch F	Junction Village, Devon Meadows
Hampton Park East Drain Extn	Hampton Park, Narre Warren South	Wylies Drain Branch H	Clyde
Hampton Park West D.S.	Hampton Park	Wylies Drain Main Branch	Botanic Ridge, Cannons Creek, Devon Meadows, Cranbourne

Table A1 – Melbourne Water Drains and Waterways within or bordering the City of Casey

FLOOD MITIGATION SYSTEMS

Flood mitigation has predominantly been developed in the form of 23 Retarding Basins, 3 Pumping Stations and 14 Levees within the Municipality. These flood mitigation systems are as follows in the tables below. To view their locations and connecting waterway/drainage systems, see map B in Appendix F.

RETARDING BASINS

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Berwick Waters	Ti-Tree Creek	149,000m^2	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	131 C8
Berwick West	Hessell Road Drain	31,570m^2	50ML	Unavailable	Unavailable	26.2m AHD	Very Low	0	110 J7
Cardinia Creek	Cardinia Creek	396,700m^2	850ML	46.1m AHD	Unavailable	49.5m AHD	High C	Unavailable	131 K2
Cardinia Creek Drop Structure	Cardinia Creek	150,500m^2	200ML	29.1m AHD	29.1m AHD	31.2m AHD	Low	Unavailable	214 B11
Clyde Creek	Clyde Creek	43.330m^2	121ML	N/A	Unavailable	3.5m	Very Low	0	134 J3
Essex Park No.1	Essex Park Drain	49,060m^2	158ML	41.7m AHD	44.5m AHD	44.8m AHD	Significant	Unavailable	91 C1
Essex Park No.2	Essex Park Drain	108,200m^2	158ML	N/A	39.3m AHD	39.7m AHD	Very Low	0	91 B1
Essex Park Extension	Essex Park Drain Extension	43,600m^2	73.4ML	73.5m AHD	73.9m AHD	74.5m AHD	Significant	Unavailable	82 G11
Evans Road	Monahans Road Drain / Cranbourne Outfall Drain	90,183m^2	292.5ML	26.55m AHD	27.1m AHD	27.1m AHD	High C	10	129 C11
Fairbairn Road	Fairbairn Road Drain	63,520m^2	82.8ML	Unavailable	44.6m AHD	45m AHD	High C	Unavailable	133 G3
Greaves Road	Ti-Tree Creek Drain	610,700m^2	Unavailable	21.55m AHD	21.55m AHD	Unavailable	Very Low	0	130 J3
Hallam Bypass	Troups Creek West Branch	128,886m^2	515.5ML	Unavailable	22.5m AHD	S8.8m AHD	Very Low	0	108 A10
Hessell Road	Narre Warren Township	56,280m^2	105ML	54.1m AHD	54.6m AHD	55m AHD	Significant	Unavailable	110 K4
Homestead Road	Homestead Road Drain	18,150m^2	5ML	18.65m AHD	Unavailable	19.5m AHD	Unavailable	Unavailable	130 K2
Marriot Waters	Cranbourne Outfall Drain	39,965m^2	115ML	N/A	Unavailable	N/A (In-cut)	Very Low	0	128 K7
Melville Park Drain	Berwick South Drain	16,060m^2	Unavailable	N/A	Unavailable	2.5m	Low	Unavailable	111 D10
Monahans Road	Monahans Road Drain	2,590m^2	5.4ML	32.1m AHD	Unavailable	33m AHD	Very Low	0	133 E5
Narre Warren North	Troups Creek West Branch	87,063m^2	200ML	55.5m AHD	Unavailable	4.5m	High A	98	108 G7
Narre Warren Township	Narre Warren Township	50,220m^2	92.5ML	27.4m AHD	27.9m AHD	28.1m AHD	High	Unavailable	110 F5

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Narre Warren South	Narre Warren South Outfall	52,222m^2	49.3ML	17.2m AHD	17.5m AHD	17.8m AHD	Very Low	0	110 D8
Police Road R/B (City of Knox)	Dandenong Creek	1,181,000m^2	660ML	39.6m AHD	42.0m AHD	4.9m (42.7m AHD)	Very Low	0	81 F6
Prospect Hill	Troups Creek East Branch	73,060m^2	71.5ML	36.7m AHD	36.4m AHD	36.7m AHD	High A	Unavailable	110 G1
Thompson Road	Cranbourne Central Drain	94,180m^2	105.9ML	N/A	32.1m AHD	33m AHD	High A	Unavailable	129 H10
Troups Creek East	Troups Creek East Branch	86,960m^2	50ML	18.1m AHD	18.5m AHD	18.9m AHD	Low	Unavailable	110 C4

Table A2 – Melbourne Water Retarding Basins within or affecting the City of Casey

A number of reserves and parklands along waterways in the Municipality may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Akoonah Park	Cardinia Creek	Princes Highway, Berwick	111 H10
Cryil Molyneux Reserve	Berwick West Drain	Princes Highway Berwick	110 J7
Edwin Flack Reserve	Manuka Road Drain	Manuka Road, Berwick	111 H7
Frog Hollow Reserve	Eumemmering Creek Central & Hallam North Road Drain	David Collins Drive, Hallam	91 H8
Gunns Road Reserve	Eumemmering Creek	Gunns, Road, Hallam	91 E10
Kevin Adlard Reserve	Eumemmering Creek	Laurel Avenue, Doveton	91 C9
Kirsty Lotkowitz Reserve	Berwick West Drain	Avebury Drive, Berwick	110 K5
Lawson Poole Reserve	Cranbourne Central Drain	Cranbourne	129 H10
Narre Warren North Recreation Reserve	Eumemmering Creek	Belgrave- Hallam Road, Narre Warren North	108 A7
Waratah Reserve	Eumemmering Creek	Laurel Avenue, Doveton	91 B9

Table A3 – Casey City Council Reserves along waterways

PUMPING STATIONS

Melbourne Water Pumping Station	On Drain / Waterway	Location	No. of Pumps	Capacity	Consequence of Failure	Melway Reference
Ayers Close PS	Lyndhurst South D.S.	Adjacent to outfall drain, Ayers Close, Lynbrook	1	Unavailable	Failure may result in 100 properties flooded	129 E6
Dwarf Galaxias Wetland Windmill	Hallam Valley Contour Drain	Narre Warren South RB to Dwarf Galaxias wetlands	1	Unavailable	N/A	110 D9
Rachel Drive PS	Lyndhurst South D.S.	NW corner of Reserve, Rachel Drive, Lynbrook	1	Unavailable	Flooding of subdivisional streets	129 E6

Table A4 – Melbourne Water Pumping Stations within the City of Casey

LEVEES

Melbourne Water Levee	Reach	Side	Levee Height	Levee Length	Expected Level of Protection	ANCOLD Hazard Rating	Houses at risk behind Levee	Melway Reference
Dwarf Galaxias Wetland	Narre Warren South RB to Dwarf Galaxias Conservation Wetland	South	1.5m	134m	Unavailable	Unavailable	0	110 D9
Hallam Contour Drain,	Centre Road to Golf Links Road	North	2m	776m	100mm freeboard in 100yr ARI event	Significant	17	110 H11-G12
Hallam Contour Drain,	Cranbourne Road to Shrives Road	North	2.02m	1.54km	Unavailable	Very Low	0	110 D11-C7
Hallam Contour Drain,	Golf Links Road to Cranbourne Road	North	2.15m	1.73km	Does not provide 100yr ARI protection. Expected to overtop, consequences not high, waterways allow for this	Low	1	110 D11-H11
Hallam Contour Drain,	Greaves Road to Centre Road	North	1.5m	1.69km	Unavailable	Significant upstream to Very Low downstream	28	130 H1-2, J-k3
Hallam Contour Drain,	Hallam Road to South Gippsland Freeway	North	2m	1.94km	Unavailable	Very Low	0	96 G6-B5
Hallam Contour Drain,	Shrives Road to Troupes Creek West Branch	North	2m	1.4km	Unavailable	Very Low	0	110 C7- 96 K6
Hallam Contour Drain,	Troups Creek West Branch to Hallam Road	North	2m	1.59km	Unavailable	Vet Low	0	96 K6-G5
Narre Warren Drain	Centre Road to Shrives Road	East	2.05m	264m	Unavailable	Very Low	0	110C7-D7
Narre Warren Drain	Railway line to Centre Road	East	2.05m	241m	Levee will fail in 100yr event because of drain cut into levee at railway end	High C	17	110 D7
Narre Warren Drain	Centre Road to Shrives Road	West	2.3m (19.1m AHD upstream to 18.0m AHD downstream)	249m	500mm freeboard in 100yr ARI event	Very Low	0	110 C7-D7
Narre Warren Drain	Railway line to Centre Road	West	2.3m	246m	Unavailable	High C	20	110 D7
Troups Creek West	Hallam Contour Drain to Railway Line	East	1.57m	600m	Excess of 1m in 100yr ARI event	Very Low	0	96 K5
Troups Creek West	Hallam Contour Drain to Railway Line	West	1.52m	611m	Excess of 1m in 100yr ARI event	Very Low	0	96 K5

Table A5 – Levees within the City of Casey

SEWERAGE INFRASTRUCTURE

There is no sewerage Infrastructure expected to be either impacted by or impact floodwaters during severe flood events within the City of Casey.

FLOOD WARNING SYSTEM

Within the City of Casey, Melbourne Water has 2 hydrographic monitoring sites along Eumemmering Creek and Hallam Valley Contour Drain. In the adjacent Municipality of Cardinia, there are 2 hydrographic monitoring sites along Cardinia Creek. These are outlined in the table below. There are also 2 rain gauges within the Municipality in Cranbourne and Berwick and monitors upstream from Casey, including Dandenong Creek at Police Road Retarding Basin, Rowville. These gauges can be monitored online through Melbourne Water at: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx or through the Bureau of Meteorology at: http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. To view their locations, see mapping in **Appendix F**.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Tide Gauge	Melway Ref
Berwick	586199	Beaumont Road, Berwick		✓		111 G2
Cardinia Creek Drop Structure, Officer South	228382A	Eastern bank of the creek within the Drop Structure R/B, Officer South	✓	✓		214 C12
Cardinia Creek, Cardinia	228228A	Western bank of the creek at Chasemore Rd, Clyde North	✓	✓		Key 14 P15
Cranbourne	586375	At Botanical Gardens Office, Wylies Creek Trk		✓		133 E12
Eumemmerring Creek, Narre Warren North	228235A	North side of the creek, 400m west of Belgrave-Hallam Road, Narre Warren North	✓			108 F3
Hallam Valley Contour Drain, Hampton Park	228231A	North side of the Channel, 1.3km west of Hallam Road, Hampton Park	✓	✓		96 D4
Tooradin	288399A	Evans Inlet, Tooradin			✓	144 A6

Table A6 – Hydrographic Monitoring Stations within the City of Casey

Other gauges located in adjoining Municipalities that may assist in flood warning for the City of Casey are outlined below. To view their locations, see mapping in **Appendix F**.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Cardinia Creek d/s Cardinia Reservoir, Beaconsfield Upper	229258A	North side of the creek at end of Duffys Rd, Beaconsfield Upper	✓		210 C3
Dandenong Creek at Police Road RB, Rowville	228368A	North side of embankment. Access via Illawarra Avenue and through gate to the north.	✓	✓	81 E
Emerald (Cardinia Reservoir)	586033	Along Road 7 at Cardinia Reservoir, Emerald		✓	126 G10

Table A7 – Hydrographic Monitoring Stations within adjacent Municipalities to the City of Casey

A number of localised “flashing light” flood warning systems operate within the City of Casey. Known systems operate at Fountain Gate, under Westfield management and Lyndhurst pedestrian underpass, managed by VicTrack.

There are currently two Melbourne Water flood warning gauges on Cardinia and Dandenong Creeks that could be used to assist with public safety. These are at Chasemore Road Cardinia and

Police Road Retarding Basin, Rowville. Those gauges with flood class levels established are outlined in the table below.

Hydrographic Monitoring Station	Creek Flood Class Level		
	Minor	Moderate	Major
Cardinia Creek at Chasemore Road, Cardinia	2.7m	3.0m	3.4m
Dandenong Creek at Police Road R/B, Rowville	4.6m	5.0m	5.5m

Table A8 – Hydrographic Monitoring Stations with established Flood Class Levels for the City of Casey

At these sites on Cardinia and Dandenong Creeks, 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 the City of Casey monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

HISTORIC FLOODS

Casey City Council has a history of flooding, including floods in 2010, 2011 and 2012 that resulted in road closures, damage to public and private property and rehousing of people and animals.

During floods, a number of essential services are at risk in the City of Casey, including Main Arterial Roads, Pakenham and Cranbourne train lines and access to Casey Hospital for non 4WD vehicles.

4-5th February 2011 – The deluge was such an extraordinary and extreme event that an assessment by Melbourne Water referred to it as a one in more than 500 year event.[1] While the event caused widespread and indiscriminate flooding and damage to infrastructure across the municipality, it also resulted in significant impacts for the Casey community. Houses were inundated for days and the major arterial roads closed until the flood waters receded in Melbourne Water's Hallam Valley Main Drain. Specific areas in Casey impacted by the floods were: Overtopping of Hallam Main Drain and the associated wetlands east of Narre Warren- Cranbourne Road and Golf Links Road flooded, isolating a small residential estate for extended periods. Properties along Shrives Road & Centre/Fullard Road were inundated for a number of days. Several properties backing onto the River Gum Reserve in Hampton Park were inundated. Properties in Robjant Street, Mary Street, & Karol Court, Hampton Park were inundated.

[1] Inquiry into Flood Mitigation Infrastructure in Victoria – City of Casey, August 2011-

Significant floods (with high flood gauge levels and likely flooding consequences to property and infrastructure) to have occurred within the City of Casey are as follows in the table below. To view the locations of these floods, see mapping in **Appendix F**.

Event	Dandenong Creek at Rowville (228368A)		Eumemmerring Creek at Narre Warren North (228235A)	Hallam Valley Contour Drain at Hampton Park (228231A)		Cardinia Creek at Cardinia (228228A)	
	Rainfall at Gauge	Creek Height	Creek Height	Rainfall at Gauge	Creek Height	Rainfall at Gauge	Creek Height
Normal Water Level	-	0.5m	0.3m	-	0.60m	-	0.2m
Minor Flood Class		4.6m					2.7m
Moderate Flood Class		5.0m					3.0m
Major Flood Class		5.5m					3.4m
15th May 1974	-	-	-	-	-	-	3.98m
30th June 1977	-	-	-	-	3.09m	-	1.29m
26th July 1977	-	-	-	-	3.25m	-	1.59m
7th August 1978	43mm / 36 hrs	4.74m	-	-	**3.60m**	-	1.71m
19th November 1978	61mm / 32 hrs	4.88m	-	-	3.36m	-	2.42m
6th October 1979	-	4.85m	-	-	2.70m	-	0.78m
29th June 1980	51mm / 56 hrs	4.77m	0.98m	-	1.89m	-	1.11m
25th May 1981	47mm / 23 hrs	4.77m	0.84m	-	1.97m	-	1.09m
15th October 1983	70mm / 33 hrs	4.86m	1.15m	-	3.34m	-	2.92m
18th September 1984	91mm / 99 hrs	**5.69m**	1.53m	-	3.58m	-	4.44m
26th July 1987	34mm / 19 hrs	5.14m	1.64m	-	**3.60m**	-	3.50m
11th June 1989	27mm / 19 hrs	5.01m	1.34m	-	2.26m	-	3.07m
23rd August 1989	10mm / 9 hrs	4.62m	1.10m	-	1.93m	-	1.61m
18th July 1990	44mm / 55 hrs	4.95m	1.41m	-	2.79m	-	0.46m
11th October 1990	45mm / 29 hrs	4.91m	1.44m	-	3.32m	-	4.09m
5th July 1991	38mm / 25 hrs	5.04m	1.28m	-	1.85m	-	1.15m
18th September 1991	36mm / 36 hrs	4.63m	1.04m	-	2.51m	-	2.03m
31st December 1991	46mm / 19 hrs	4.86m	1.00m	-	1.27m	-	0.77m
15th September 1993	32mm / 25 hrs	4.85m	0.41m	-	2.56m	-	2.81m
27th December 1993	63mm / 46 hrs	4.97m	1.20m	-	2.32m	-	1.66m

Event	Dandenong Creek at Rowville (228368A)		Eumemmerring Creek at Narre Warren North (228235A)	Hallam Valley Contour Drain at Hampton Park (228231A)		Cardinia Creek at Cardinia (228228A)	
	Rainfall at Gauge	Creek Height	Creek Height	Rainfall at Gauge	Creek Height	Rainfall at Gauge	Creek Height
Normal Water Level	-	0.5m	0.3m	-	0.60m	-	0.2m
Minor Flood Class		4.6m					2.7m
Moderate Flood Class		5.0m					3.0m
Major Flood Class		5.5m					3.4m
23rd June 1996	-	4.75m	1.12m	44mm / 22 hrs	2.23m	48mm / 22 hrs	1.27m
29th July 1996	59mm / 35 hrs	5.12m	1.41m	63mm / 32 hrs	2.97m	31mm / 13 hrs	3.62m
14th April 2003	66mm / 60 hrs	2.11m	0.75m	71mm / 60 hrs	2.25m	62mm / 60 hrs	0.56m
3rd December 2003	30mm / 3 hrs	4.64m	1.97m	5mm / 2 hrs	0.59m	6mm / 3 hrs	-
13th November 2004	38mm / 10 hrs	4.91m	2.39m	38mm / 6 hrs	2.75m	30mm / 7 hrs	3.14m
3rd February 2005	130mm / 37 hrs	5.56m	**2.87m**	107mm / 26 hrs	3.06m	118mm / 25 hrs	3.20m
22nd December 2007	75mm / 34 hrs	4.76m	0.53m	81mm / 27 hrs	2.83m	67mm / 33 hrs	0.41m
31st October 2010	68mm / 39 hrs	4.80m	1.15m	55mm / 20 hrs	2.67m	51mm / 20 hrs	2.11m
20th December 2010	48mm / 46 hrs	4.83m	0.76m	7mm / 15 hrs	0.85m	12mm / 6 hrs	0.43m
5th February 2011	146mm / 15 hrs	5.45m	1.86m	160mm / 28 hrs	3.28m	99mm / 27 hrs	**4.87m**
26th November 2011	52mm / 22 hrs	4.66m	1.00m	47mm / 22 hrs	2.57m	35mm / 16 hrs	1.29m
22nd June 2012	65mm / 31 hrs	4.80m	1.27m	64mm / 33 hrs	3.03m	76mm / 26 hrs	2.92m
1st June 2013	53mm / 15 hrs	4.87m	0.63m	46mm / 16 hrs	2.23m	50mm / 15 hrs	0.60m
3rd December 2017	70mm / 41 hrs	4.77m	0.76m	50mm / 41 hrs	2.16m	53mm / 41 hrs	0.79m
8th December 2017	65mm / 11 hrs	4.61m	0.92m	39mm / 14 hrs	2.31m	28mm / 7 hrs	0.79m

Table A9 – Selection of Historical Flood Events along the Dandenong, Eumemmerring, Cardinia Creeks and Hallam Valley Contour Drain

DAM FAILURE

Flooding resulting from failure of Cardinia Reservoir is likely to cause significant structural and community damage within the City of Casey. See Dam Failure in Section 3 of this plan for more information. 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.

Melbourne Water Dam	Location	Owner	Dam Capacity	Full Supply Level	Melway Reference
Cardinia Reservoir	Wellington Road, Emerald	Melbourne Water	287,000ML	167.06m AHD	126 C4

Table A10 – Melbourne Water Reservoirs that pose a risk to the City of Casey from Dam Failure

Service Reservoirs located within the Municipality are listed below.

Melbourne Water Service Reservoir	Location	Owner	Material	Reservoir Capacity	Melway Reference
Hallam North Steel Tank	Hallam North Road, Narre Warren North	Melbourne Water	Steel	27.6 ML	91 K1
Cranbourne Steel Tank	Cranbourne Racecourse and Recreation Reserve, Grant Street, Cranbourne	Melbourne Water	Steel	14.3ML	133 J8

Table A11 – Melbourne Water Service Reservoirs in the City of Casey

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 (gauge)	Location To (gauge)	Typical Travel Time	Comments
DANDENONG CREEK			
Rowville	Dandenong	Between 4 to 9 hours	Minor Flood
		Between 2 to 3 hours	Moderate Flood
		Between 2 to 4 hours	Major Flood
CARDINIA CREEK			
Beaconsfield Upper	Officer South	Unknown	
Officer South	Cardinia	Around 1 hour	Minor Flood
		Around 1 hour	Moderate Flood
		Between 1 to 2 hours	Major Flood
EUMEMMERRING CREEK			
Narre Warren North	Dandenong South	Between 4 to 10 hours	Inflows from the Hallam Valley Contour Drain may impact on travel time.

Table B1 – Typical Flood Travel Times between gauges on the Dandenong, Cardinia & Eumemmerring Creeks

Historical Travel Times

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
DANDENONG CREEK				**Rowville**
18-19th September 1984	Rowville	Dandenong	2 hours	Major
29-30th July 1987	Rowville	Dandenong	3 hours	Moderate
25-26th December 1988	Rowville	Dandenong	6 hours	Minor
11th June 1989	Rowville	Dandenong	2 hours	Moderate
17th July 1990	Rowville	Dandenong	16 hours	Minor
12th October 1990	Rowville	Dandenong	4 hours	Minor
6th July 1991	Rowville	Dandenong	3 hours	Moderate
15th September 1993	Rowville	Dandenong	4 hours	Minor
27th December 1993	Rowville	Dandenong	7 hours	Minor
30th July 1996	Rowville	Dandenong	3 hours	Moderate

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
3rd December 2003	Rowville	Dandenong	7 hours	Minor
3rd February 2005	Rowville	Dandenong	4 hours	Major
21st December 2007	Rowville	Dandenong	9 hours	Minor
31st October 2010	Rowville	Dandenong	6 hours	Minor
20th December 2010	Rowville	Dandenong	7 hours	Minor
5th February 2011	Rowville	Dandenong	2 hours	Moderate
22nd June 2012	Rowville	Dandenong	4 hours	Minor
1st June 2013	Rowville	Dandenong	6 hours	Minor
3rd December 2017	Rowville	Dandenong	7 hours	Minor
8th December 2017	Rowville	Dandenong	6 hours	Minor
CARDINIA CREEK				**Cardinia**
30th July 1996	Officer South	Cardinia	1 hour	Major
13th November 2004	Officer South	Cardinia	1 hour	Moderate
3rd February 2005	Officer South	Cardinia	1 hour	Moderate
5th February 2011	Officer South	Cardinia	2 hours	Major
22nd June 2012	Officer South	Cardinia	1 hour	Minor
EUMEMMERRING CREEK				-
17 August 1983	Narre Warren North	Dandenong South	5 hours	-
13th September 1983	Narre Warren North	Dandenong South	6 hours	-
16th October 1983	Narre Warren North	Dandenong South	5 hours	-
18th September 1984	Narre Warren North	Dandenong South	6 hours	-
11th October 1990	Narre Warren North	Dandenong South	5 hours	-
13th November 2004	Narre Warren North	Dandenong South	5 hours	-
3rd February 2005	Narre Warren North	Dandenong South	4 hours	-
5th February 2011	Narre Warren North	Dandenong South	10 hours	-
22nd June 2012	Narre Warren North	Dandenong South	4 hours	-

Table B2 – Historical Flood Travel Times between gauges on the Dandenong, Cardinia & Eumemmerring Creeks

APPENDIX C1 – DANDENONG CREEK FLOOD EMERGENCY PLAN

OVERVIEW OF FLOODING CONSEQUENCES

Dandenong Creek has headwaters in the foothills of the Dandenong Ranges near Olinda and flows west through Yarra Ranges Shire and forms the boundary separating the Cities of Maroondah and Knox. Dandenong Creek then continues south, forming the western border of City of Knox before entering the City of Casey east of Stud Road at Police Paddocks Reserve. Dandenong Creek flows through Endeavour Hills and Doveton, forming part of the north western boundary of Casey before exiting the municipality at Thomas Carroll Reserve in Doveton. After leaving the municipality, Dandenong creek converges with Eumemmering Creek to form Patterson River, which drains into Port Phillip Bay at Carrum.

The Essex Park and Essex Park Extension Retarding Basins are situated on the Essex Park Drain system in Endeavour Hills. At three separate locations, they control the flow of runoff from the Churchill National Park into the urban area and drain network. Flows from Essex Park Darin System join Dandenong Creek at Heatherton Road, Doveton

If Dandenong Creek is flood, Heatherton Road may become inundated.

These Summary tables are 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 Dandenong Creek in the City of Casey

Property					
Properties	**0**				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	0		Prisons	0	
Essential Infrastructure					
Major Roads	1	Heatherton Road	Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	1	695 along Heatherton Rd	Sewerage Facilities	0	
Power Facility	0		Levees	1	Heatherton Road
Comms Services	0		Drainage Facilities	0	
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	0		Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	3	Greater Dandenong, Knox & Monash	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C1.1 – Consequence Summary of 1% AEP flood along Dandenong Creek in the City of Casey

Summary of Consequences in a 1% AEP (100yr ARI) flood along the Essex Park and Heatherton-Power Road Drains in the City of Casey

Property					
Properties	**71**				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	1	Old Endeavour Hills Secondary College Site			
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	0		Prisons	0	
Essential Infrastructure					
Major Roads	0		Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	0	695, 843, 845, 849, 861 & 982	Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	3	Essex Park R/Bs
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities			Caravan Parks		
Recreation Facilities			Camping Grounds		
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	3	Greater Dandenong, Knox & Monash	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C1.2 – Consequence Summary of 1% AEP flood along the Essex Park and Heatherton – Power Rd Drains in the City of Casey

WARNING TIMES

Warnings are available for flooding expected along Dandenong Creek at Police Road Retarding Basin in Rowville. 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.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Dandenong Creek at Police Road RB, Rowville	228368A	North side of embankment. Access via Illawarra Avenue and through gate to the north.	✓	✓	81 E
Dandenong Creek at Hammond Road, Dandenong	228204C	South side of the Channel, at the end of Southbourne Ave, Dandenong	✓		90 C9

Table C1.3 – Hydrographic Monitoring Stations within the Dandenong 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. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/ and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

AREAS OF FLOOD RISK

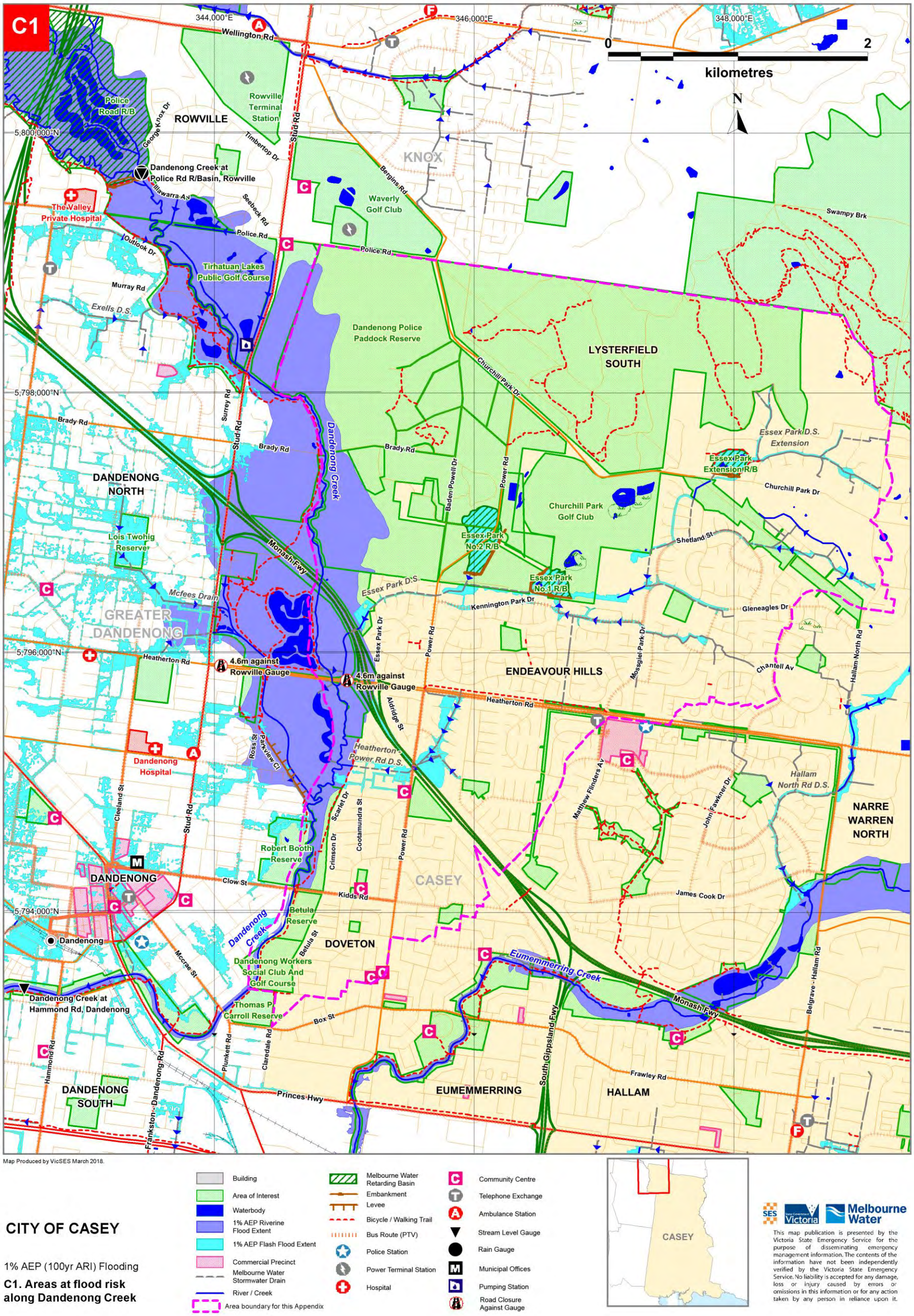

Figure C1 – Areas of flood risk around Dandenong Creek in the City of Casey

PROPERTIES AT FLOOD RISK

Properties listed in the table below are at risk from flooding during a 1% AEP flood event. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Essex Park D.S. (WBM, October 2000) and the Heatherton – Power Rd D.S. (CMPS&F Pty, April 1998) flood mapping and risk assessment programs.

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**
12-38	Amalfi Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
17	Amalfi Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
23	Amalfi Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
25	Amalfi Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
2	Bittern Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
8	Bittern Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
12	Bittern Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
14	Bittern Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
16	Bittern Drive	Endeavour Hills	Heatherton-Power Road D.S.	Flash
1/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
2/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
3/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
4/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
5/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
6/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
7/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
8/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
9/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
10/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
11/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
12/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
13/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
14/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
17/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
18/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
19/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
20/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
21/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
22/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
23/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
24/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
25/96	Botanical Grove	Doveton	Heatherton-Power Road D.S.	Flash
1	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
2	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
3	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
4	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
16	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
17	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash

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
18	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
19	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
20	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
21	Clangula Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
1/16	Cormorant Close	Endeavour Hills	Heatherton-Power Road D.S.	Flash
2/16	Cormorant Close	Endeavour Hills	Heatherton-Power Road D.S.	Flash
17	Cormorant Close	Endeavour Hills	Heatherton-Power Road D.S.	Flash
9	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
11	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
13	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
15	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
29	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
31	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
32	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
33	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
35	Floriana Avenue	Doveton	Heatherton-Power Road D.S.	Flash
21	Gymkhana Court	Endeavour Hills	Essex Park D.S. Extension	Flash
29	Gymkhana Court	Endeavour Hills	Essex Park D.S. Extension	Flash
285	Hallam North Road	Endeavour Hills	Essex Park D.S. Extension	Flash
16	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
18	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
20	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
22	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
24	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
26	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
28	Heatherton Road	Endeavour Hills	Heatherton-Power Road D.S.	Flash
19	Heathmere Crescent	Endeavour Hills	Essex Park D.S. Extension	Flash
85	Mossgiel Park Drive	Endeavour Hills	Essex Park D.S. Extension	Flash
9	Muirkirk Close	Endeavour Hills	Essex Park D.S. Extension	Flash
1	Nadia Court	Endeavour Hills	Heatherton-Power Road D.S.	Flash
63	Scotsburn Way	Endeavour Hills	Essex Park D.S. Extension	Flash
65	Scotsburn Way	Endeavour Hills	Essex Park D.S. Extension	Flash
67	Scotsburn Way	Endeavour Hills	Essex Park D.S. Extension	Flash

Total
71

Table C1.4 – Properties at risk of flooding along Dandenong Creek in the City of Casey.

ISOLATION

No major isolation risks exist for Endeavour Hills, Lysterfield South or Doveton during a 1% AEP (100yr ARI) event. With Heatherton Road a risk of flooding, access via this route may be cut for a period. Alternative routes either via the Monash Freeway, Kidds Road or McCrae Street are expected to remain open. Some localised short-duration isolation may also 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 City of Casey is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/9_Casey_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Dandenong Creek 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 Dandenong Creek. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

VicRoads Roads flooded in a 1% AEP (100yr ARI) event
• Heatherton Road, Doveton at Dandenong Creek, between Stud Road and Monash Freeway

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

Casey City Council Roads flooded in a 1% AEP (100yr ARI) event		
DOVETON	**ENDEAVOUR HILLS**	• Heathmere Crescent
• Botanical Grove	• Amalfi Drive	• Kennington Park Drive
	• Brady Road	• Power Road

Table C1.6 – Casey City Council Possible Road Closures during a flooding event

FLOOD MITIGATION

RETARDING BASINS

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Essex Park No. 1 RB	Essex Park D.S.	49,060m^2	158ML	41.7m AHD	44.5m AHD	44.8m AHD	Significant	Unavailable	91 C1
Essex Park No. 2 RB	Essex Park D.S.	108,200m^2	158ML	N/A	39.3m AHD	39.7m AHD	Very Low	0	91 B1
Essex Park Extension RB	Essex Park D.S. Extension	43,600m^2	73.4ML	73.5m AHD	73.9m AHD	74.5m AHD	Significant	Unavailable	82 G11
Police Road R/B (City of Knox)	Dandenong Creek	1,181,000m^2	660ML	39.6m AHD	42.0m AHD	4.9m (42.7m AHD)	Very Low	0	81 F6

Table C1.7 – Melbourne Water Retarding Basins within the Dandenong Creek catchment in the City of Casey

A number of reserves and parklands along Dandenong Creek may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Essex Reserve	Dandenong Creek	Essex Park Drive, Endeavour Hills	90 J2
Police Paddock Reserve	Dandenong Creek	Brady Road, Endeavour Hills	81 H9, J12, 90 J1

Table C1.8 – Parks and Reserves along Dandenong Creek in the City of Casey

No formal Pumping Stations or Levees exist around Rowville, Endeavour Hills, Doveton and Lysterfield South.

SEWERAGE INFRASTRUCTURE

There is no sewerage Infrastructure expected to impact or be impacted by floodwaters during severe flood events along Dandenong Creek in Casey.

COMMAND, CONTROL & 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 Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

FLOOD IMPACTS & OPERATIONAL CONSIDERATIONS (INTELLIGENCE CARDS)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Dandenong Creek at various creek heights or rain totals within Casey. 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:

- Police Road Retarding Basin, Rowville
- Endeavour Hills and Doveton Flash Flooding

FLOOD INTELLIGENCE CARD – POLICE ROAD R/B GAUGE, DANDENONG CREEK

Version 3 – February 2018

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	**Police Road Retarding Basin, Illawarra Road, Rowville**
MELWAY REFERENCE:	**81 E6**
STREAM:	**Dandenong Creek**
GAUGE NUMBER:	**228368A**
GAUGE ZERO:	**35.31m AHD**
GAUGE TYPE	**Stream Level, Flow & Rain**

MINOR:	**4.6m**
MODERATE:	**5.0m**
MAJOR	**5.5m**
EMBANKMENT HEIGHT:	**7.39m (42.7m AHD)**
TELEMETRIC/MANUAL	**Telemetric**
HIGHEST RECORDED FLOOD:	**5.69m (18th September 1984)**

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.29m		• Spillway Level of Police Road Retarding Basin reached	
4.34m		• Low lying areas along Dandenong Creek either side of Heatherton Road are flooded	
4.6m	**MINOR FLOOD LEVEL**	**Water Over Road** • Heatherton Road, Doveton between Stud Road & Monash Freeway possibly flooded depending on flows over the Police Road Retarding Basin spillway	
5.0m	**MODERATE FLOOD LEVEL**		
5.25m		• Height of Levee on southern side of Heatherton Road	
5.4m		**Essential Infrastructure**	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Bus Route 695 impacted by flooding along Heatherton Road **Water Over Road** • Heatherton Road, Doveton between Stud Road & Monash Freeway flooded	
5.5m	**MAJOR FLOOD LEVEL** 1% AEP (100yr ARI) Flood Level	**Community Infrastructure Flooded** • Dandenong Creek Trail flooded at various sections • Myuna Farm on Kidds Road, Doveton (Predominantly sheds and paddocks) **Water Over Road** • Brady Road, Endeavour Hills at Dandenong Creek bridge	
5.56m	3rd February 2005 Flood Level Peak		
5.69m	18th September 1984 Flood Level Peak		
6.69m		• Full Supply Level of Police Road Retarding Basin reached	
7.39m		• Embankment Level of Police Road Retarding Basin reached	

Table C1.9 – Breakdown of likely consequences at various Police Road R/B gauge level heights along Dandenong Creek with operational considerations

FLOOD INTELLIGENCE CARD – ENDEAVOUR HILLS & DOVETON FLASH FLOODING (UNGAUGED)

Version 3 – February 2018

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	**Police Road Retarding Basin**
LOCATION	**Illawarra Road, Rowville**
MELWAY REF:	**81 E6**

GAUGE NUMBER	**228368A**
GAUGE TYPE	**Rain**
TELEMETRIC/MANUAL	**Telemetric**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
23mm in 10 mins; 38mm in 30 mins; 46mm in 1 hour; 54mm in 2 hours; 60mm 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** **Essex Park D.S. Extension** • 21 & 29 Gymkhana Court, Endeavour Hills • 285 Hallam North Road, Endeavour Hills • 19 Heathmere Crescent, Endeavour Hills • 85 Mossgiel Park Drive, Endeavour Hills • 9 Muirkirk Close, Endeavour Hills • 63, 65 & 67 Scotsburn Way, Endeavour Hills **Heatherton-Power Road D.S.** • 12-38, 17, 23 & 25 Amalfi Drive, Endeavour Hills • 2, 8, 12, 14 & 16 Bittern Drive, Endeavour Hills • Units 1-25/96 Botanical Grove, Doveton • 1, 2, 3, 4, 16, 17, 18, 19, 20 & 21 Clangula Court, Endeavour Hills • 1/16, 2/16 & 17 Cormorant Close, Endeavour Hills	VicSES State and Region to provide warnings to the community and other agencies. VicSES will provide warnings using OSOM and SMSER as required based on the predications provided by BoM regarding flood levels and the risk of Flash Flooding. The Central Duty officer in conjunction with the Regional Agency Controller will maintain operational awareness and form an appropriate response arrangement to suit the level of incident

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 9, 11, 13, 15, 29, 31, 32, 33 & 35 Floriana Avenue, Doveton • 16, 18, 20, 22, 24, 26 & 28 Heatherton Road, Endeavour Hills • 1 Nadia Court, Endeavour Hills **Water Over Road** **Essex Park Drain** • Heathmere Crescent, Endeavour Hills • Kennington Park Drive, Endeavour Hills • Power Road, Endeavour Hills **Heatherton-Power Road Drain** • Amalfi Drive, Endeavour Hills • Botanical Grove, Doveton	VicSES to respond as per request by request basis. Council to provide road closure signage if required.

Table C1.10 – Breakdown of possible consequences at various rainfall intensities around Endeavour Hills and Doveton with operational considerations

APPENDIX C2 – EUMEMMERRING FLOOD EMERGENCY PLAN

OVERVIEW OF FLOODING CONSEQUENCES

Eumemmerring Creek is a natural waterway beginning in the Yarra Ranges Shire and entering the City of Casey at Belgrave-Hallam Road. Eumemmerring Creek flows in a south westerly direction through Narre Warren North, Endeavour Hills, Hallam, Doveton and Eumemmerring before exiting the Municipality at Princes Highway, Dandenong South where it continues in a south westerly direction before converging with Dandenong Creek at Bangholme to form Patterson River. Stormwater collected by the Hallam North Drainage System in residential areas of Endeavour Hills drains into Eumemmerring Creek at Frog Hollow Reserve in Hallam.

The area is comprised of residential and rural zones, with upper reaches predominantly rural with greater urbanisation in the central to lower reaches. Most of the central reaches of Eumemmerring Creek lie within reserves, and residential development around the central and lower reaches of Eumemmerring Creek has led to modification of the creek bed.

Most flooding around Eumemmerring, Doveton, Hallam, Endeavour Hills and Narre Warren North is limited to lower lying areas around Eumemmerring Creek with limited flooding around Hallam North D.S. and Heatherton Road D.S.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Eumemmerring Creek					
Property					
Properties	**8**				
Residential	4				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	4				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	0		Prisons	0	
Essential Infrastructure					
Major Roads	3	Belgrave-Hallam Road, Hallam North Road & Heatherton Road	Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	0		Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	0	
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	4	Recreation Reserves	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Yarra Ranges & Greater Dandenong	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C2.1 – Consequence Summary of 1% AEP flood along Eumemmerring Creek

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Hallam North Road Drain					
Property					
Properties	**4**				
Residential	1				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	3				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	0		Prisons	0	
Essential Infrastructure					
Major Roads	0		Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	0		Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	0	
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	1	Frog Hollow Reserve	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1		CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C2.2 – Consequence Summary of 1% AEP flood along the Hallam North Rd Drain

WARNING TIMES

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.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Tide Gauge	Melway Ref
Eumemmerring Creek, Narre Warren North	228235A	North side of the creek, 400m west of Belgrave-Hallam Road, Narre Warren North	✓			108 F3

Table C2.3 – Hydrographic Monitoring Stations within the Eumemmerring 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. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/ and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

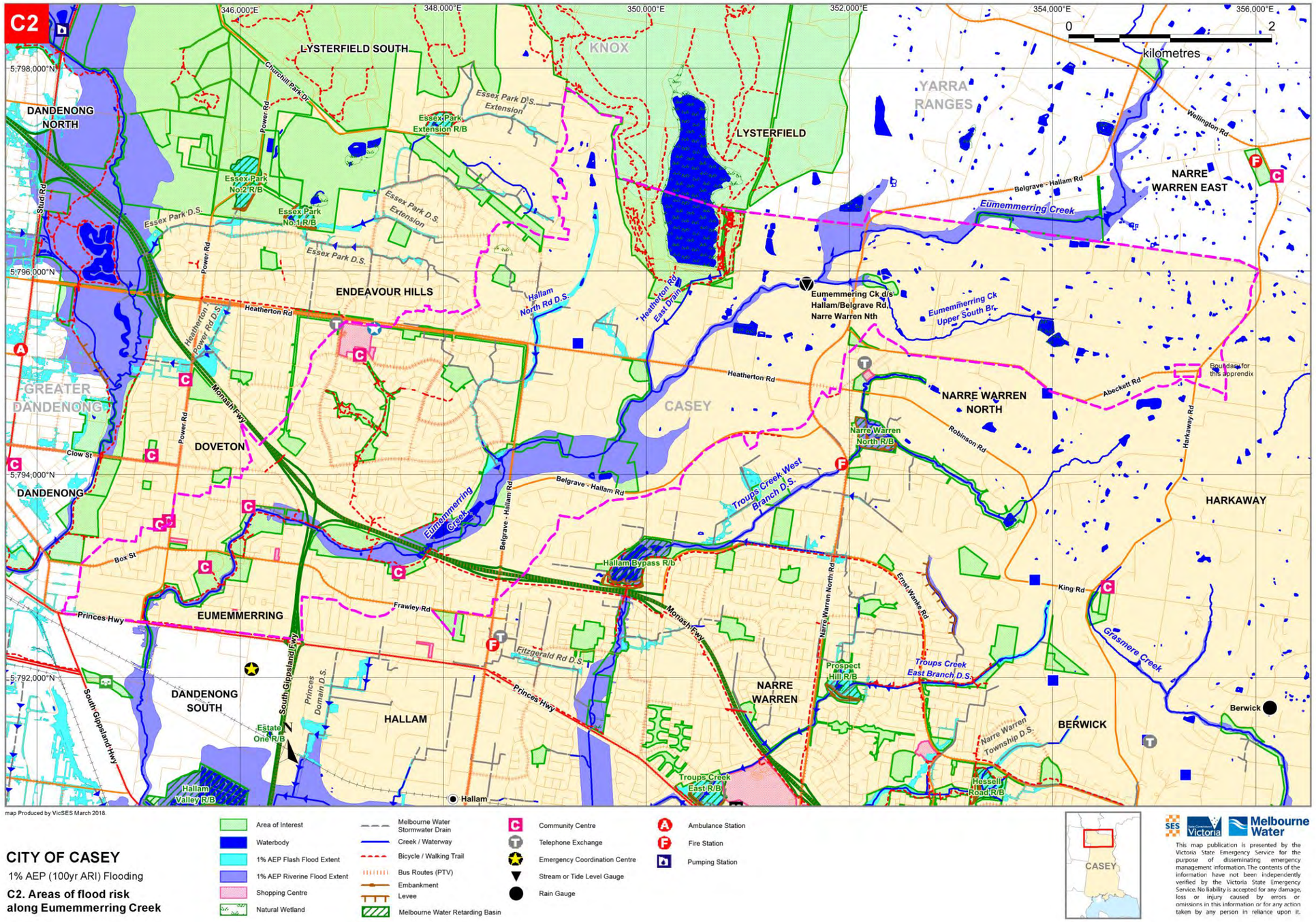

Figure C2 – Areas of flood risk around Eumemmerring Creek in the City of Casey

PROPERTIES AT FLOOD RISK

Properties listed in the table below are at risk from flooding along Eumemmerring Creek and its tributaries in Casey. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Eumemmerring Creek (WBM, October 200) and the Hallam North (WBM, October 2000) 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 along Eumemmerring Creek and tributaries during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
209-219l	Belgrave-Hallam Road	Narre Warren North	Eumemmerring Creek	Riverine
29-30	Carolyn Close	Narre Warren North	Hallam North Rd D.S.	Flash
158-160l	David Collins Drive	Endeavour Hills	Eumemmerring Creek	Riverine
23	Ebeli Close	Narre Warren North	Hallam North Rd D.S.	Flash
1	Glenara Court	Endeavour Hills	Hallam North Rd D.S.	Flash
104-108	Hallam North Road	Narre Warren North	Hallam North Rd D.S.	Flash
1-5	Horswood Road	Narre Warren North	Eumemmerring Creek	Riverine
40	Laurel Avenue	Doveton	Eumemmerring Creek	Riverine
42	Laurel Avenue	Doveton	Eumemmerring Creek	Riverine
44	Laurel Avenue	Doveton	Eumemmerring Creek	Riverine
46	Laurel Avenue	Doveton	Eumemmerring Creek	Riverine
2-4	Reservoir Road	Narre Warren North	Eumemmerring Creek	Riverine

Total
12

Table C2.4 – Properties at risk of flooding along in the Eumemmerring Creek catchment in the City of Casey

ISOLATION

No major isolation risks exist for areas around Eumemmerring, Doveton, Hallam, Endeavour Hills and Narre Warren North 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 City of Casey is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/9_Casey_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Eumemmerring, Doveton, Hallam, Endeavour Hills and Narre Warren North near Eumemmerring Creek 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 Eumemmerring, Doveton, Hallam, Endeavour Hills and Narre Warren North. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

VicRoads Roads flooded in a 1% AEP (100yr ARI) event
• Belgrave-Hallam Road, Narre Warren North
• Hallam North Road between Belgrave-Hallam Road and James Cook Drive
• Heatherton Road, Narre Warren North

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

Casey City Council Roads flooded in a 1% AEP (100yr ARI) event	
ENDEAVOUR HILLS	**EUMEMMERRING**
• Lauristin Drive	• Doveton Avenue
• Thomas Mitchell Drive	**DOVETON**
	• Laurel Avenue

Table C2.6 – Casey City Council Possible Road Closures during a flooding event

FLOOD MITIGATION

RETARDING BASINS

No formal Retarding Basins, Pumping Stations or Levees exist around Eumemmerring Creek in Eumemmerring, Doveton, Endeavour Hills, Hallam and Narre Warren North.

A number of reserves and parklands along Eumemmerring Creek may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Waratah Reserve	Eumemmerring Creek	Laurel Avenue, Doveton	91 B9
Kevin Adlard Reserve	Eumemmerring Creek Central	Laurel Avenue, Doveton	91 C9
Gunns Road Reserve	Eumemmerring Creek Central	Gunns Road, Hallam	91 E10
Frog Hollow Reserve	Eumemmerring Creek Central & Hallam North Road D.S	David Collins Drive, Hallam	91 H8
Narre Warren North Recreation Reserve	Eumemmerring Creek Central	Belgrave- Hallam Road, Narre Warren North	108 A7

Table C2.7 – Parks and Reserves along along Eumemmerring Creek in the City of Casey

COMMAND, CONTROL & 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 Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

FLOOD IMPACTS & OPERATIONAL CONSIDERATIONS (INTELLIGENCE CARDS)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Eumemmerring Creek and the Hallam North Rd Drain at various gauge heights or rain totals within Casey. 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:

- Narre Warren North Gauge, Eumemmerring Creek
- Hallam North Road Drain

FLOOD INTELLIGENCE CARD – NARRE WARREN NORTH GAUGE, EUMEMMERRING CREEK

Version 3 – March 2018

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	**Downstream of Hallam-Belgrave Road, Narre Warren North**
MELWAY REFERENCE:	**108 F3**
STREAM:	**Eumemmerring Creek**
GAUGE NUMBER:	**228235A**
GAUGE ZERO:	**58.07m AHD**
GAUGE TYPE	**Stream Level & Rain**

MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
TELEMETRIC/MANUAL	**Telemetric**
HIGHEST RECORDED FLOOD:	**2.87m (3rd February 2005)**

Creek Height (m)	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.87m	3rd February 2005 Flood Level Peak		
3.83m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **8 Properties in Total** • 209-219l Belgrave-Hallam Road, Narre Warren North • 158-160l David Collins Drive, Endeavour Hills • 1-5 Horswood Road, Narre Warren North • 40, 42, 44 & 46 Laurel Avenue, Doveton • 2-4 Reservoir Road, Narre Warren North **Community Infrastructure Flooded** • Narre Warren North Recreation Reserve, Belgrave- Hallam Road, Narre Warren North • Kevin Adlard Reserve & Soccer Club, Laurel Avenue, Doveton • Frog Hollow Reserve, Endeavour Hills bordered by several large dams	VicSES State and Region to provide warnings to the community and other agencies. VicSES will provide warnings using OSOM and SMSER as required based on the predications provided by BoM regarding flood levels and the risk of Flash Flooding. The Central Duty officer in conjunction with the Regional Agency Controller will maintain operational awareness and form an appropriate response arrangement to suit the

Creek Height (m)	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Gunns Road Reserve, Gunns Road, Hallam between Monash Fwy and Residential properties • Eumemmerring Creek Trail, track flooded between Hallam North Road, Endeavour Hills and Princes Highway, Eumemmerring **Essential Infrastructure Impacted** • Bus Routes 695 & 697 along Belgrave-Hallam Road • Bus Routes 695 & 842 along Heatherton Road • Bus Routes 863 & 982 along Hallam North Road **Water Over Road** • Belgrave-Hallam Road, Narre Warren North • Doveton Avenue , Eumemmerring near Laurel Avenue • Hallam North Road, Endeavour Hills between Belgrave-Hallam Road and James Cook Drive • Heatherton Road, Narre Warren North	level of incident VicSES to respond as per request by request basis. Council to provide road closure signage if required.

Table C2.8 – Breakdown of likely consequences at various Narre Warren North gauge level heights along Eumemmerring Creek with operational considerations

FLOOD INTELLIGENCE CARD – HALLAM NORTH ROAD DRAIN (UNGAUGED)

Version 3 – March 2018

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	**Eumemmerring Creek at Narre Warren North**
LOCATION	**Downstream of Hallam-Belgrave Road, Narre Warren North**
MELWAY REF:	**108 F3**

GAUGE NUMBER	**228235A**
GAUGE TYPE	**Rain**
TELEMETRIC/MANUAL	**Telemetric**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
22mm in 10 mins; 35mm in 30 mins; 43mm in 1 hour; 52mm in 2 hours; 59mm 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** **4 Properties in Total** • 29-30 Carolyn Close, Narre Warren North • 23 Ebeli Close, Narre Warren North • 1 Glenara Court, Endeavour Hills • 104-108 Hallam North Road, Narre Warren North **Community Infrastructure Flooded** • Frog Hollow Reserve, David Collins Drive, Hallam **Essential Infrastructure** • Power Transformer on Laurinston Drive, Endeavour Hills opposite Sheridan Court in close proximity to floodwaters along Lauriston Drive **Water Over Road** • Lauriston Drive, Endeavour Hills • Thomas Mitchell Drive, Endeavour Hills	VicSES to respond as per request by request basis. Council to provide road closure signage if required.

APPENDIX C3 – CARDINIA CREEK FLOOD EMERGENCY PLAN

OVERVIEW OF FLOODING CONSEQUENCES

Cardinia Creek forms approx. 60% of the eastern boundary of Casey, entering the municipality approximately 2km downstream of Cardinia Reservoir and flowing south through Harkaway, Beaconsfield, Berwick and Clyde North before exiting the municipality at Chasemore Road, Cardinia. After leaving the Municipality, Cardinia Creek continues south through the Shire of Cardinia before discharging into Western Port Bay east of Tooradin. Cardinia Creek predominantly flows through rural land, though its tributary branches flow through a number of developed areas and are subjected to runoff from residential and commercial developments.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Cardinia Creek

Property					
Properties	**3**				
Residential	1	Haileybury College, Berwick (Sports Grounds Only)			
Commercial	0				
Industrial	0				
Public Land	2	Akoonah Park; & Manna Gum Park			
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	1	Haileybury College, Berwick (Sports Grounds)	Prisons	0	
Essential Infrastructure					
Major Roads	0		Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	2	Routes 836 & 896	Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	2	Cardinia Creek RB & Cardinia Creek Drop Structure RB
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	2	Akoonah Park; & Manna Gum Park	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport

Adjacent LGAs	1	Cardinia	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C3.1 – Consequence Summary of 1% AEP flood along Cardinia Creek

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Manuka Road Drain

Property					
Properties	**2**				
Residential	1	30 Howell Drive Berwick			
Commercial	0				
Industrial	0				
Public Land	1	Edwin Flack Reserve, Manuka Road, Berwick			
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	0		Prisons	0	
Essential Infrastructure					
Major Roads	0		Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	0		Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	0	
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	1	Edwin Flack Reserve	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C3.2 – Consequence Summary of 1% AEP flood along the Manuka Road Drain

WARNING TIMES

Warnings are available for flooding expected along Cardinia Creek at Clyde North and Officer South. 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.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Tide Gauge	Melway Ref
Berwick	586199	Beaumont Road, Berwick		✓		111 G2
Cardinia Creek d/s Cardinia Reservoir, Beaconsfield Upper	229258A	North side of the creek at end of Duffys Rd, Beaconsfield Upper	✓			210 C3
Cardinia Creek Drop Structure, Officer South	228382A	Eastern bank of the creek within the Drop Structure R/B, Officer South	✓	✓		214 C12
Cardinia Creek, Cardinia	228228A	Western bank of the creek at Chasemore Rd, Clyde North	✓	✓		Key 14 P15
Emerald (Cardinia Reservoir)	586033	Along Road 7 at Cardinia Reservoir, Emerald		✓		126 G10

Table C3.3 – Hydrographic Monitoring Stations within the Cardinia 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. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/ and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

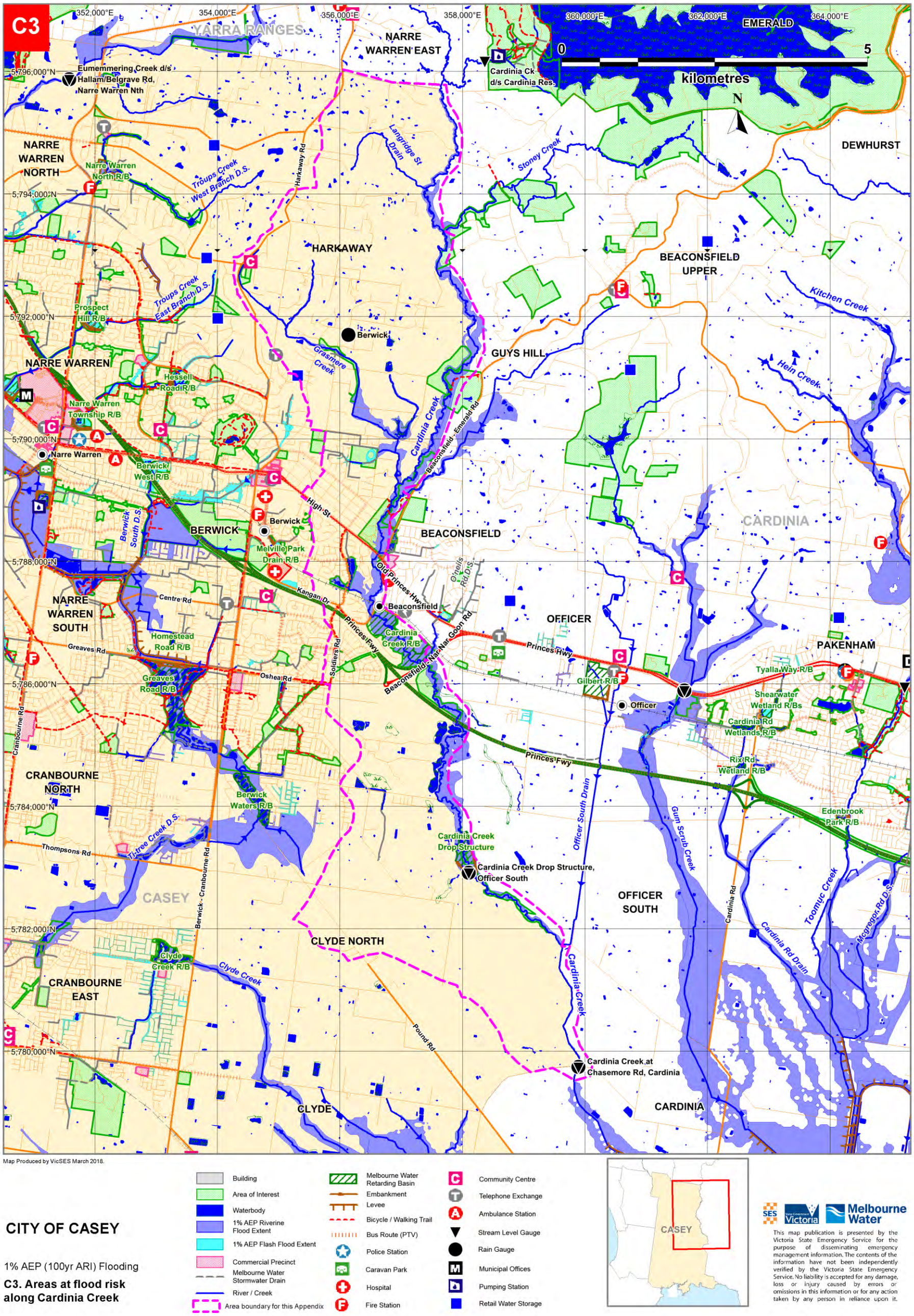

Figure C3 – Areas of flood risk around Cardinia Creek in the City of Casey

PROPERTIES AT FLOOD RISK

Properties listed in the table below are at risk from flooding along Cardinia Creek and the Manuka Road Drain. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Cardinia Creek (Melbourne Water, Dec 1989) flood mapping and risk assessment program.

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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
2	Cardinia Street	Berwick	Cardinia Creek	Riverine
138A	High Street	Berwick	Cardinia Creek	Riverine
30	Howell Drive	Berwick	Manuka Road Drain	Flash
79-93I	Manuka Road	Berwick	Manuka Road Drain	Flash
214-226	Soldiers Road	Beaconsfield	Cardinia Creek	Riverine

Total
5

Table C3.4 – Properties at risk of flooding along the Cardinia Creek catchment in the City of Casey

ISOLATION

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

ESSENTIAL INFRASTRUCTURE

Apart from the roads outlined below, all other essential infrastructure and services areas around Harkaway, Berwick, Beaconsfield and Clyde North 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 Harkaway, Berwick, Beaconsfield and Clyde North. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Casey City Council Roads flooded in a 1% AEP (100yr ARI) event	
BEACONSFIELD	BERWICK
• Soldiers Road	• Howell Drive

Table C3.5 – Casey City Council Possible Road Closures during a flooding event

FLOOD MITIGATION

RETARDING BASINS

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Cardinia Creek	Cardinia Creek	396,700m^2	850ML	46.1m AHD	Unavailable	49.5m AHD	High C	Unavailable	131 K2
Cardinia Creek Drop Structure	Cardinia Creek	150,500m^2	200ML	29.1m AHD	29.1m AHD	31.2m AHD	Low	Unavailable	214 B11

Table C3.6 – Melbourne Water Retarding Basins within the Cardinia Creek catchment in the City of Casey

A number of reserves and parklands along Cardinia Creek and Manuka Road D.S. may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Akoonah Park	Cardinia Creek	Princes Highway, Berwick	111 H10
Edwin Flack Reserve	Manuka Road D.S.	Manuka Road, Berwick	111 H7

Table C3.7 – Parks and Reserves along Cardinia Creek in the City of Casey

No formal Pumping Stations or Levees exist around Cardinia Creek, Grasmere Creek, Manuka Road D.S. or Edrington Park D.S. in the City of Casey

COMMAND, CONTROL & 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 Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

FLOOD IMPACTS & OPERATIONAL CONSIDERATIONS (INTELLIGENCE CARDS)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Cardinia Creek and the Manuka Rd Drain at various creek heights or rain totals within Casey. 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:

- Cardinia Creek at Officer South
- The Manuka Road and Edrington Park Drains, Berwick

FLOOD INTELLIGENCE CARD – OFFICER SOUTH GAUGE, CARDINIA CREEK

Version 3 – March 2018

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	**Cardinia Creek Drop Structure Retarding Basin, Clyde North**
MELWAY REFERENCE:	**214 B12**
STREAM:	**Cardinia Creek**
GAUGE NUMBER:	**228382A**
GAUGE ZERO:	**27.27m AHD**
GAUGE TYPE	**Stream Level & Rain**

MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
TELEMETRIC/MANUAL	**Telemetric**
HIGHEST RECORDED FLOOD:	**3.38m (5th February 2011)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.0m		• Drop Structure Operational	
3.2m	1% AEP (100yr ARI) Flood Level	**Properties At Flood Risk** • 2 Cardinia Street, Berwick • 138 High Street, Berwick • 214-226 Soldiers Road, Beaconsfield **Community Infrastructure Flooded** • Akoonah Park, Princes Highway, Berwick (Parkland only, structures expected to remain predominantly dry) • Haileybury College, Berwick Campus 'Edrington', High Street, Berwick, grassed areas flooded • Manna Gum Picnic Area, Soldiers Road, Beaconsfield **Water Over Road**	VicSES State and Region to provide warnings to the community and other agencies. VicSES will provide warnings using OSOM and SMSER as required based on the predications provided by BoM regarding flood levels and the risk of Flash Flooding. The Central Duty officer in conjunction with the Regional Agency Controller will maintain operational awareness and form an appropriate response arrangement to suit the

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Soldiers Road, Beaconsfield	level of incident Council to provide road closure signage if required.
3.38m	5th February 2011 Flood Level Peak		

Table C3.8 – Breakdown of likely consequences at various Officer South gauge level heights along Cardinia Creek with operational considerations

FLOOD INTELLIGENCE CARD – MANUKA ROAD DRAIN (UNGAUGED)

Version 3 – March 2018

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	**Berwick Rain Gauge**
LOCATION	**Beaumont Road, Berwick**
MELWAY REF:	**111 G2**

GAUGE NUMBER	**586199**
GAUGE TYPE	**Rain**
TELEMETRIC/MANUAL	**Telemetric**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
21mm in 10 mins; 33mm in 30 mins; 42mm in 1 hour; 56mm in 2 hours; 85mm in 6 hours; or 111mm 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** **2 Property in Total** **Manuka Road D.S.** • 30 Howell Drive, Berwick • 79-93l Manuka Road, Berwick **Community Infrastructure Flooded** **Manuka Road D.S.** • Edwin Flack Reserve, Manuka Road, Berwick, oval flooded **Water Over Road** **Manuka Road D.S.** • Howell Drive, Berwick	VicSES to respond as per request by request basis. Council to provide road closure signage if required.

Table C3.9 – Breakdown of possible consequences at various rainfall intensities around Berwick with operational considerations

APPENDIX C4 – HALLAM VALLEY FLOOD EMERGENCY PLAN

OVERVIEW OF FLOODING CONSEQUENCES

The Hallam Valley Contour Drain is a large stormwater drainage system, with a relatively large catchment area stretching from Cranbourne East in the south where Ti-Tree Creek feeds the Contour Drain, working its way northwest through Berwick, Narre Warren South, Narre Warren, Hallam and Hampton Park where the open channel drain exists the City of Casey to join Eumemmerring Creek in the City of Greater Dandenong.

The area comprises of mixed residential, industrial and Rural Living zones. Key Infrastructure in the area and at risk is the Berwick Shopping Precinct and the Narre Warren Shopping Precinct and a number of major roads including Clyde Road at Princes Highway in Berwick, Hallam Road in Hampton Park and Narre Warren – Cranbourne Road at Golf Links Road.

Three residential areas are either at risk from inundation or isolation during a large event including the communities living along Golf Links Road in Narre Warren where the Casey Aged Care facility is located; the community along the River Gum Creek (Hampton Park East Drain) north of Pound Road in Hampton Park and the community around Mary Street near the South Gippsland Highway also in Hampton Park. All of these communities were severely impacted during the recent flood event in February 2011.

Because of the relatively flat terrain around Hampton Park and Hallam, flooding in the area can take a number of days to subside. For more information on flooding in the area, see Mapping in **Appendix F**.

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 Hallam Valley Contour Drain					
Property					
Properties	**10**				
Residential	10				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	0	
Care Facilities	1	Casey Aged Care Isolation Risk	Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	0		Prisons	0	
Essential Infrastructure					
Major Roads	2	Narre Warren – Cranbourne Road; & Shrives Road	Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	11	798, 834, 835, 841, 847, 863, 891, 894, 895, 981 & 982	Sewerage Facilities	0	
Power Facility	0		Levees	14	
Comms Services	0		Drainage Facilities	3	2 Retarding Basins & 1 Pumping Station
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	4	Reserves	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Greater Dandenong	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C4.1 – Consequence Summary of 1% AEP flood along the Hallam Valley Contour Drain and Stormwater Tributaries

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Summary of Consequences in a 1% AEP (100yr ARI) flood along the Hallam Valley Contour Drain's Stormwater Tributaries

Property					
Properties	**106**				
Residential	101				
Commercial	3				
Industrial	1				
Public Land	1				
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	2	Brentwood Park Preschool; Mansfield Preschool
Care Facilities	1	Coptic Hostel	Community Venues	3	Berwick Shopping Centre; Parkhill Plaza; Hampton Park Shopping Centre
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	2	Timbarra Primary School; Mary MacKillop Catholic Primary School	Prisons	0	
Essential Infrastructure					
Major Roads	4	Clyde Rd; Hallam Rd; Pound Rd; & Princes Hwy	Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	16	828, 831, 834, 835, 838, 839, 847, 849, 863, 891, 892, 894, 895, 926, 981 & 982	Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	10	Retarding Basins
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	6	Reserves	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C4.2 – Consequence Summary of 1% AEP flood along the Hallam Valley Contour Drain and Stormwater Tributaries

WARNING TIMES

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 lack of upstream gauges and generally short warning times available.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Tide Gauge	Melway Ref
Hallam Valley Contour Drain, Hampton Park	228231A	North side of the Channel, 1.3km west of Hallam Road, Hampton Park	✓	✓		96 D4

Table C4.3 – Hydrographic Monitoring Stations within the Hallam Valley Contour 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. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/ and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

AREAS OF FLOOD RISK

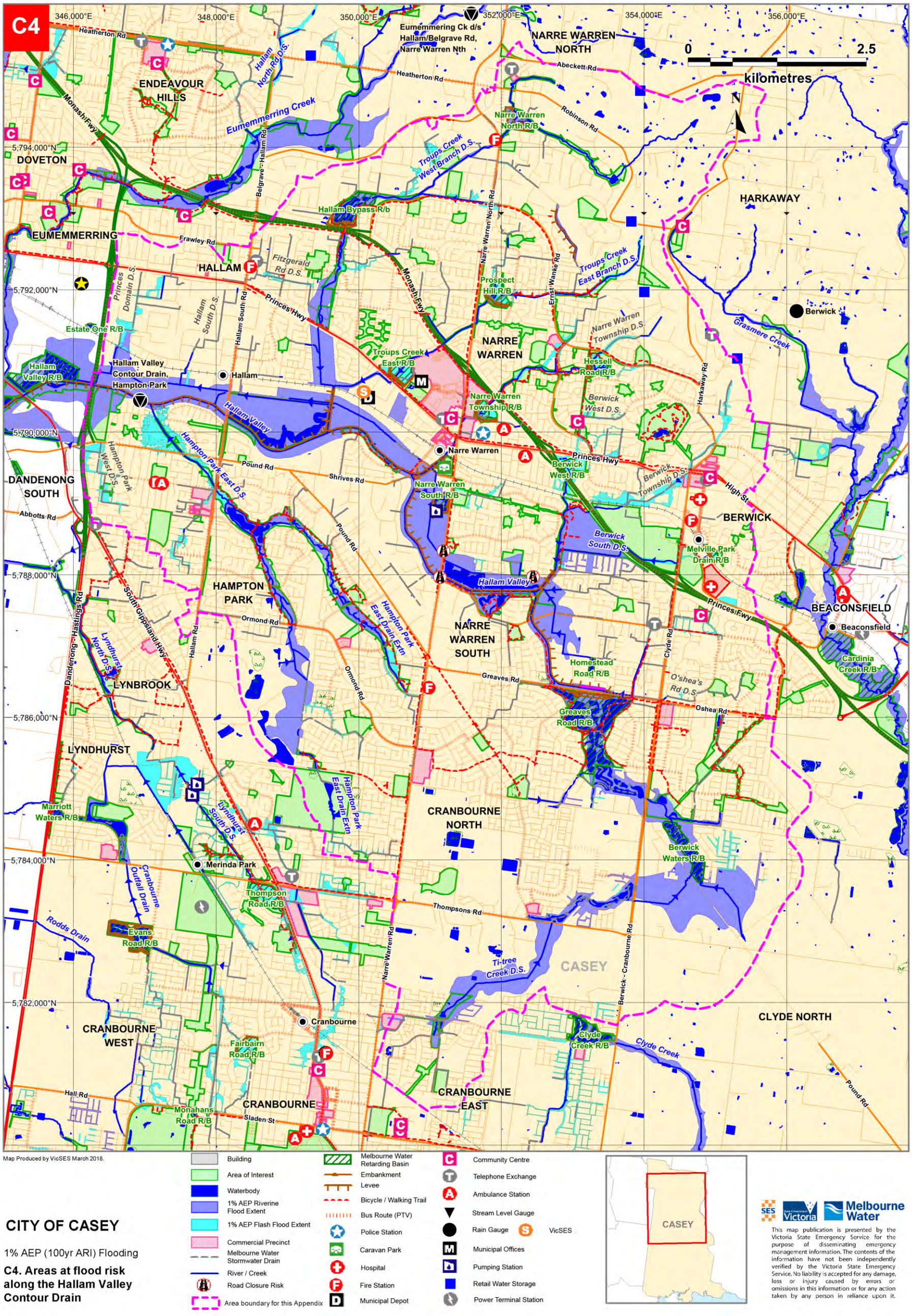

Figure C4 – Areas of flood risk around Hallam Valley in the City of Casey

PROPERTIES AT FLOOD RISK

Properties listed in the table below are at risk from flooding along the Hallam Valley Contour Drain. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Hallam Valley Catchment (Melbourne Water, March 2001) 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 along the Hallam Valley Contour Drain during a 1% AEP event

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
322-340	Centre Road	Berwick	Hallam Valley Contour Drain	Riverine
335-347	Centre Road	Berwick	Hallam Valley Contour Drain	Riverine
349-351	Centre Road	Berwick	Hallam Valley Contour Drain	Riverine
353-355	Centre Road	Berwick	Hallam Valley Contour Drain	Riverine
357-359	Centre Road	Berwick	Hallam Valley Contour Drain	Riverine
18	Halcyon Way	Narre Warren South	Hallam Valley Contour Drain	Riverine
20	Halcyon Way	Narre Warren South	Hallam Valley Contour Drain	Riverine
22	Halcyon Way	Narre Warren South	Hallam Valley Contour Drain	Riverine
24	Halcyon Way	Narre Warren South	Hallam Valley Contour Drain	Riverine
130	Homestead Road	Berwick	Hallam Valley Contour Drain	Riverine

Total
10

Table C4.4 – Properties at risk of flooding along the Hallam Valley Contour Drain catchment in the City of Casey

Properties listed in the table below are at risk from flooding over-floor along the stormwater drains discharging into the Hallam Valley Contour Drain. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Berwick West & Township Drain (WaterTech, April 2013), the Hampton Park East Drain (Melbourne Water, January 2013), the Hampton Park West Drain (CMPS&F Pty Ltd, April 1998), Narre Warren Township Drain (WBM, October 2000), the O'Shea's Rd Drain (WBM, October 2000) the Troups Creek West Branch Drain (Melbourne Water, February 2015) and the Troups Creek East Branch Drain (WBM, October 2000) flood mapping and risk assessment programs.

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Properties at risk from Flooding Over-Floor along Hallam Valley's Stormwater Tributaries

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				
✓	✓	✓	3 Ambleside Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	5 Ambleside Crescent	Berwick	Berwick Township Drain	Flash

Properties at risk from Flooding Over-Floor along Hallam Valley's Stormwater Tributaries						
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				
✓	✓	✓	6 Ambleside Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	7 Ambleside Crescent	Berwick	Berwick Township Drain	Flash
		✓	19 Ambleside Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	48 Ambleside Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	26 Bemersyde Drive	Berwick	O'Shea's Rd Drain	Flash
		✓	151 Bemersyde Drive	Berwick	O'Shea's Rd Drain	Flash
	✓	✓	153 Bemersyde Drive	Berwick	O'Shea's Rd Drain	Flash
✓	✓	✓	155 Bemersyde Drive	Berwick	O'Shea's Rd Drain	Flash
✓	✓	✓	52 Cairns Road	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	54 Cairns Road	Hampton Park	Fordholm Rd East Drain	Flash
		✓	56 Cairns Road	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	30 Clive Street	Hampton Park	Hampton Park West Drain	Flash
	✓	✓	32 Clive Street	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	2-12 Clyde Road	Berwick	Berwick Township Drain	Flash
✓	✓	✓	3A Clyde Road	Berwick	Berwick Township Drain	Flash
✓	✓	✓	12 Collins Crescent	Berwick	Berwick Township Drain	Flash
		✓	14 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	16 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	18 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	20 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	22 Collins Crescent	Berwick	Berwick Township Drain	Flash
	✓	✓	24 Collins Crescent	Berwick	Berwick Township Drain	Flash
		✓	25 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	26 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	28 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	30 Collins Crescent	Berwick	Berwick Township Drain	Flash
✓	✓	✓	32 Collins Crescent	Berwick	Berwick Township Drain	Flash
	✓	✓	2 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	1/4 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	5 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	7 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	8 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	9 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	10 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	11 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	12 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	13 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	14 Daniher Close	Berwick	Berwick Township Drain	Flash
✓	✓	✓	2 Ernst Wanke Road	Narre Warren North	Troups Creek West Branch Drain	Flash
✓	✓	✓	25 Fitzgerald Road	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	27 Fitzgerald Road	Hallam	Fitzgerald Road Drain	Flash
		✓	149 Fordholm Road	Hampton Park	Hampton Park West Drain	Flash

Properties at risk from Flooding Over-Floor along Hallam Valley's Stormwater Tributaries						
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				
✓	✓	✓	8 Gifford Close	Berwick	O'Shea's Rd Drain	Flash
✓	✓	✓	10 Hawking Avenue	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	12 Hawking Avenue	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	14 Hawking Avenue	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	5 Hazeldene Court	Berwick	Berwick Township Drain	Flash
✓	✓	✓	12 Hazeldene Court	Berwick	Berwick Township Drain	Flash
✓	✓	✓	2 High Street	Berwick	Berwick Township Drain	Flash
		✓	34 Ivan Crescent	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	36 Ivan Crescent	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	40 Ivan Crescent	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	42 Ivan Crescent	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	44 Ivan Crescent	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	46 Ivan Crescent	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	2 Karol Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	4 Karol Court	Hampton Park	Hampton Park West Drain	Flash
		✓	5 Karol Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	6 Karol Court	Hampton Park	Hampton Park West Drain	Flash
		✓	52 Kurrajong Road	Narre Warren	Troups Creek East Branch Drain	Flash
✓	✓	✓	10 Legend Court	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	14 Legend Court	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	1 Lena Court	Berwick	O'Shea's Rd Drain	Flash
✓	✓	✓	2 Mansfield Street	Berwick	Berwick Township Drain	Flash
	✓	✓	8 Mansfield Street	Berwick	Berwick Township Drain	Flash
✓	✓	✓	10 Mansfield Street	Berwick	Berwick Township Drain	Flash
		✓	29 Mansfield Street	Berwick	Berwick Township Drain	Flash
✓	✓	✓	8 Maralee Court	Berwick	O'Shea's Rd Drain	Flash
		✓	9 Maralee Court	Berwick	O'Shea's Rd Drain	Flash
		✓	10 Maralee Court	Berwick	O'Shea's Rd Drain	Flash
		✓	2 Margaret Street	Berwick	Berwick Township Drain	Flash
✓	✓	✓	6 Margaret Street	Berwick	Berwick Township Drain	Flash
✓	✓	✓	8 Margaret Street	Berwick	Berwick Township Drain	Flash
✓	✓	✓	13 Mark Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	15 Mark Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	17 Mark Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	10 Marson Crescent	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	12 Marson Crescent	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	31 Marson Crescent	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	33 Marson Crescent	Hallam	Fitzgerald Road Drain	Flash
✓	✓	✓	35 Marson Crescent	Hallam	Fitzgerald Road Drain	Flash
		✓	5 Nola Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	8 Nola Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	12 Nola Court	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	1 Patricia Court	Berwick	Berwick Township Drain	Flash

Properties at risk from Flooding Over-Floor along Hallam Valley's Stormwater Tributaries						
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				
✓	✓	✓	3 Patricia Court	Berwick	Berwick Township Drain	Flash
✓	✓	✓	4 Patricia Court	Berwick	Berwick Township Drain	Flash
✓	✓	✓	5 Patricia Court	Berwick	Berwick Township Drain	Flash
		✓	2 Pound Road	Hampton Park	Hampton Park West Drain	Flash
		✓	4/92 Pound Road	Hampton Park	Hampton Park East Drain	Flash
		✓	94 Pound Road	Hampton Park	Hampton Park East Drain	Flash
		✓	96 Pound Road	Hampton Park	Hampton Park East Drain	Flash
✓	✓	✓	10 Pride Court	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	12 Pride Court	Hampton Park	Fordholm Rd East Drain	Flash
	✓	✓	2 Riley Place	Hampton Park	Fordholm Rd East Drain	Flash
✓	✓	✓	3 Riley Place	Hampton Park	Fordholm Rd East Drain	Flash
	✓	✓	5 Roxby Court	Berwick	Narre Warren Township Drain	Flash
✓	✓	✓	6 Roxby Court	Berwick	Narre Warren Township Drain	Flash
✓	✓	✓	7 Roxby Court	Berwick	Narre Warren Township Drain	Flash
✓	✓	✓	15 Roxby Court	Berwick	Narre Warren Township Drain	Flash
	✓	✓	18 Vanessa Drive	Hampton Park	Hampton Park West Drain	Flash
		✓	25 Vanessa Drive	Hampton Park	Hampton Park West Drain	Flash
		✓	27 Vanessa Drive	Hampton Park	Hampton Park West Drain	Flash
✓	✓	✓	67-75 Wedgewood Road	Hallam	Princes Domain Drain	Flash
Totals						
78	86	106				

Table C4.5 – Properties at risk of flooding along the Hallam Valley Contour Drain's Tributaries catchment in the City of Casey

ISOLATION

No major isolation risks exist for areas around Narre Warren, Hallam, Berwick and Hampton Park during a 1% AEP (100yr ARI) event. Cranbourne North, Cranbourne East and surrounds may experience isolation from northern suburbs if Narre Warren-Cranbourne Rd, Hallam Rd, Clyde Rd and South Gippsland Highway all become inundated and closed to traffic. Some localised short-duration isolation may occur due to flash flooding.

ESSENTIAL INFRASTRUCTURE

- Casey Aged Care Facility on Golf Links Road, Narre Warren at risk of isolation with Golf Links Road and Narre Warren – Cranbourne Road flooded from Hallam Valley Contour Drain during a 1% AEP event.

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 City of Casey is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/9_Casey_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Narre Warren, Hallam, Berwick, Hampton Park and Cranbourne 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 Narre Warren, Hallam, Berwick, Hampton Park and Cranbourne. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

VicRoads Roads flooded in a 1% AEP (100yr ARI) event
• Clyde Road, Berwick at Princes Highway
• Hallam Road, Hampton Park at Somerville Road
• Narre Warren – Cranbourne Road, Narre Warren at Golf Links Road
• Narre Warren – Cranbourne Road, Narre Warren at Railway Underpass
• Pound Road, Hampton Park between Verona Drive and Oaktree Drive
• Princes Highway, Berwick at Clyde Road
• Shrives Road, Narre Warren at Centre Road

Table C4.6 – VicRoads Possible Road Closures during a flooding event

Casey City Council Roads flooded in a 1% AEP (100yr ARI) event			
BERWICK	• Margaret Street	• General Joshua Drive	• Francine Court
• Ambleside Crescent	• McNabb Street	• Harbury Mews	• Fullard Road
• Argyle Court	• Neagle Mews	• Hazleldean Court	• Golf Links Road
• Bashel Court	• St.Boswells Avenue	• Leonne Court	• Jands Close
• Bemersyde Drive	• Timbarra Way	• Manning Close	• Kurrajong Road
• Carluke Close	• Tumut Court	• Mary Street	• Murdoch Avenue
• Centre Road	• Ward Road	• Millswyn Avenue	• Murray Way
• Collins Crescent	• Watson Gardens	• Narellan Drive	• Nita Close
• Daniher Close	**CRANBOURNE NORTH**	• Nola Court	• Strawbent Rise
• Ernst Wanke Road	• Godwin Crescent	• Ormond Road	• Sweeney Drive
• Hagen Drive	**HALLAM**	• Rene Place	• Valley Fair Drive
• Hazeldene Court	• Conquest Way	• Robjant Street	• Wattlebird Court
• Homestead Road	• O'Grady Road	• Verona Drive	• Western Way
• Kinsale View	• Rimfire Drive	• Village Drive	• Willow Court
• Lena Court	• Wedgewood Road	**NARRE WARREN**	**NARRE WARREN SOUTH**
• Mansfield Street	**HAMPTON PARK**	• Centre Road	Greaves Road
• Maralee Court	• Beckington Crescent	• Dookie Court	

Table C4.7 – Casey City Council Possible Road Closures during a flooding event

FLOOD MITIGATION

RETARDING BASINS

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Berwick Waters	Ti-Tree Creek	149,000m^2	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	131 C8
Berwick West	Hessell Road Drain	31,570m^2	50ML	Unavailable	Unavailable	26.2m AHD	Very Low	0	110 J7
Clyde Creek	Clyde Creek	43.330m^2	121ML	N/A	Unavailable	3.5m	Very Low	0	134 J3
Greaves Road	Ti-Tree Creek Drain	610,700m^2	Unavailable	21.55m AHD	21.55m AHD	Unavailable	Very Low	0	130 J3
Hallam Bypass	Troups Creek West Branch	128,886m^2	515.5ML	Unavailable	22.5m AHD	S8.8m AHD	Very Low	0	108 A10
Hessell Road	Narre Warren Township	56,280m^2	105ML	54.1m AHD	54.6m AHD	55m AHD	Significant	Unavailable	110 K4
Melville Park Drain	Berwick South Drain	16,060m^2	Unavailable	N/A	Unavailable	2.5m	Low	Unavailable	111 D10
Narre Warren North	Troups Creek West Branch	87,063m^2	200ML	55.5m AHD	Unavailable	4.5m	High A	98	108 G7
Narre Warren Township	Narre Warren Township	50,220m^2	92.5ML	27.4m AHD	27.9m AHD	28.1m AHD	High	Unavailable	110 F5
Narre Warren South	Narre Warren South Outfall	52,222m^2	49.3ML	17.2m AHD	17.5m AHD	17.8m AHD	Very Low	0	110 D8
Prospect Hill	Troups Creek East Branch	73,060m^2	71.5ML	36.7m AHD	36.4m AHD	36.7m AHD	High A	Unavailable	110 G1
Troups Creek East	Troups Creek East Branch	86,960m^2	50ML	18.1m AHD	18.5m AHD	18.9m AHD	Low	Unavailable	110 C4

Table C4.8 – Melbourne Water Retarding Basins within the Hallam Valley Contour Drain catchment in the City of Casey

PUMPING STATIONS

Melbourne Water Pumping Station	On Drain / Waterway	Location	No. of Pumps	Capacity	Consequence of Failure	Melway Reference
Dwarf Galaxias Wetland Windmill	Hallam Valley Contour Drain	Narre Warren South RB to Dwarf Galaxias wetlands	1	Unknown	N/A	110 D9

Table C4.9 – Melbourne Water Pumping Stations along the Hallam Valley Contour Drain

LEVEES

Melbourne Water Levee	Reach	Side	Levee Height	Levee Length	Expected Level of Protection	ANCOLD Hazard Rating	Houses at risk behind Levee	Melway Reference
Dwarf Galaxias Wetland	Narre Warren South RB to Dwarf Galaxias Conservation Wetland	South	1.5m	134m	Unavailable	Unavailable	0	110 D9
Hallam Contour Drain,	Centre Road to Golf Links Road	North	2m	776m	100mm freeboard in 100yr ARI event	Significant	17	110 H11-G12
Hallam Contour Drain,	Cranbourne Road to Shrives Road	North	2.02m	1.54km	Unavailable	Very Low	0	110 D11-C7
Hallam Contour Drain,	Golf Links Road to Cranbourne Road	North	2.15m	1.73km	Does not provide 100yr ARI protection. Expected to overtop, consequences not high, waterways allow for this	Low	1	110 D11-H11
Hallam Contour Drain,	Greaves Road to Centre Road	North	1.5m	1.69km	Unavailable	Significant upstream to Very Low downstream	28	130 H1-2, J-k3
Hallam Contour Drain,	Hallam Road to South Gippsland Freeway	North	2m	1.94km	Unavailable	Very Low	0	96 G6-B5
Hallam Contour Drain,	Shrives Road to Troupes Creek West Branch	North	2m	1.4km	Unavailable	Very Low	0	110 C7- 96 K6
Hallam Contour Drain,	Troups Creek West Branch to Hallam Road	North	2m	1.59km	Unavailable	Vet Low	0	96 K6-G5
Narre Warren Drain	Centre Road to Shrives Road	East	2.05m	264m	Unavailable	Very Low	0	110C7-D7
Narre Warren Drain	Railway line to Centre Road	East	2.05m	241m	Levee will fail in 100yr event because of drain cut into levee at railway end	High C	17	110 D7
Narre Warren Drain	Centre Road to Shrives Road	West	2.3m (19.1m AHD upstream to 18.0m AHD downstream)	249m	500mm freeboard in 100yr ARI event	Very Low	0	110 C7-D7
Narre Warren Drain	Railway line to Centre Road	West	2.3m	246m	Unavailable	High C	20	110 D7
Troups Creek West	Hallam Contour Drain to Railway Line	East	1.57m	600m	Excess of 1m in 100yr ARI event	Very Low	0	96 K5
Troups Creek West	Hallam Contour Drain to Railway Line	West	1.52m	611m	Excess of 1m in 100yr ARI event	Very Low	0	96 K5

Table C4.10 – Melbourne Water Levees in the Hallam Valley Contour Drain Catchment in the City of Casey

COMMAND, CONTROL & 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 Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

FLOOD IMPACTS & OPERATIONAL CONSIDERATIONS (INTELLIGENCE CARDS)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Hallam Valley Contour Drain and it's stormwater Tributaries at various gauge heights or rain totals within Casey. 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:

- Hallam Valley Contour Drain at Hampton Park
- Berwick, Narre Warren, Hallam & Hampton Park Stormwater Drains

FLOOD INTELLIGENCE CARD – HAMPTON PARK GAUGE, HALLAM VALLEY CONTOUR DRAIN

Version 3 – March 2018

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	**Hallam Valley Contour Drain (North Bank), Hampton Park, 700m East of South Gippsland Freeway**
MELWAY REFERENCE:	**96 D4**
STREAM:	**Hallam Valley Contour Drain**
GAUGE NUMBER:	**228231A**
GAUGE ZERO:	**11.668m AHD**
GAUGE TYPE	**Stream Level & Rain**

MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**3.5m (Approximate)**
TELEMETRIC/MANUAL	**Telemetric**
HIGHEST RECORDED FLOOD:	**3.60m (7th August 1978)**

Drain Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.28m	5th February 2011 Flood Level Peak	**Event Summary** • Narre Warren – Cranbourne Road at Golf Links Road and at the Railway Underpass & Golf Links Road, Narre Warren flooded with local residences isolated • Shrives Road & Centre Road, Narre Warren flooded with properties inundated for a number of days • Homestead Road & Centre Road, Berwick with properties inundated • Rimfire Drive, Hallam commercial estate isolated for a number of days with flooding along Centre Road east of Hallam South Road • Approximately 100 properties in Casey severely flooded	VicSES State and Region to provide warnings to the community and other agencies. VicSES will provide warnings using OSOM and SMSER as required based on the predications provided by BoM regarding flood levels and the risk of Flash Flooding. The Central Duty officer in conjunction with the Regional Agency Controller will maintain operational awareness and form an appropriate response arrangement to suit the

Drain Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
			level of incident
3.33m	1% AEP (100yr ARI) Flood Level	• Greaves Road Retarding Basin Spillway Level & Full Supply Level reached on Greaves Road Narre Warren South **Properties at Flood Risk** **115 Properties in Total** • 322-340, 335-347, 349-351, 353-355 & 357-359 Centre Road, Berwick • 18, 20, 22 & 24 Halcyon Way, Narre Warren South • 130 Homestead Road, Berwick • 46 properties off Golf Links Road, Narre Warren near Narre Warren – Cranbourne Road at risk of isolation • 59 industrial properties on Rimfire Drive, Hallam at risk of isolation with Centre Road flooded **Community Infrastructure Affected** • Casey Aged Care Facility on Golf Links Road, Narre Warren at risk of isolation with Golf Links Road and Narre Warren – Cranbourne Road flooded • Clyde Road Reserve, Berwick • Hallam Main Drain Reserve, Narre Warren South • Hallam Valley Reserve, Narre Warren • K M Reedy Reserve, Hampton Park **Essential Infrastructure Affected** • Bus Routes 798 on Linsell Boulevard; 834, 835 & 981 on Greaves Road; 847 on Centre Road; 834, 835, 841 & 895 on Narre-Warren - Cranbourne Road; 863, 891, 894, 982 on Hallam Road **Water Over Road** • Greaves Road, Narre Warren South at Greaves Road Retarding Basin • Ward Road, Berwick • Homestead Road, Berwick • Centre Road, Berwick at Homestead Road • Cashel Court, Berwick • Kinsale View, Berwick • Golf Links Road, Narre Warren near Narre Warren – Cranbourne Road • Narre Warren – Cranbourne Road, Narre Warren at Golf Links Road • Narre Warren – Cranbourne Road, Narre Warren at Railway Underpass • Centre Road, Narre Warren east of Hallam South Road • Shrives Road, Narre Warren at Centre Road	VicSES to respond as per request by request basis. Aged care facility to implement their emergency evacuation plan if required Council to provide road closure signage if required.

Drain Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Fullard Road, Narre Warren • Willow Court, Narre Warren • Valley Fair Drive, Narre Warren • Strawbent Rise, Narre Warren • Western Way, Narre Warren • Rimfire Drive, Hallam • O'Grady Road, Hallam	
3.5m		• Approximate Levee Height	
3.60m	7th August 1978 Flood Level Peak		

Table C4.11 – Breakdown of likely consequences at various Hampton Park gauge level heights along the Hallam Valley Contour Drain with operational considerations

FLOOD INTELLIGENCE CARD – BERWICK, NARRE WARREN, HALLAM & HAMPTON PARK STORMWATER DRAINS (UNGAUGED)

Version 3 – March 2018

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	**Berwick**
LOCATION	**Beaumont Road, Berwick**
MELWAY REF:	**111G2**

GAUGE NUMBER	**586199**
GAUGE TYPE	**Rain**
TELEMETRIC/MANUAL	**Telemetric**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
14mm in 10 mins; 24mm in 30 mins; 31mm in 1 hour; 41mm in 2 hours; 62mm in 6 hours; or 81mm 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.	5% AEP (20 year ARI)	**Properties at Flood Risk (Over-Floor)** **78 Properties in Total** **Berwick Township Drain** • 3, 5, 6, 7 & 48 Ambleside Crescent, Berwick • 2-12 & 3A Clyde Road, Berwick • 12, 16, 18, 20, 22, 26, 28, 30 & 32 Collins Crescent, Berwick • 1/4, 5, 7, 8, 9, 10, 11, 12, 13 & 14 Daniher Close, Berwick • 5 & 12 Hazeldene Court, Berwick • 2 High Street, Berwick • 2 & 10 Mansfield Street, Berwick • 2, 6 & 8 Margaret Street, Berwick • 1, 3, 4 & 5 Patricia Court, Berwick **Fitzgerald Road Drain** • 25 & 27 Fitzgerald Road, Hallam • 10 & 14 Legend Court, Hallam • 10, 12, 31, 33 & 35 Marson Crescent, Hallam **Fordholm Rd East Drain**	VicSES State and Region to provide warnings to the community and other agencies. VicSES will provide warnings using OSOM and SMSER as required based on the predications provided by BoM regarding flood levels and the risk of Flash Flooding. The Central Duty officer in conjunction with the Regional Agency Controller will maintain operational awareness and form an appropriate response arrangement to suit the level of incident

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 52 & 54 Cairns Road, Hampton Park • 10, 12 & 14 Hawking Avenue, Hampton Park • 36, 40, 42, 44 & 46 Ivan Crescent, Hampton Park • 10 & 12 Pride Court, Hampton Park • 3 Riley Place, Hampton Park **Hampton Park West Drain** • 30 Clive Street, Hampton Park • 2, 4 & 6 Karol Court, Hampton Park • 13, 15 & 17 Mark Court, Hampton Park • 8 & 12 Nola Court, Hampton Park **Narre Warren Township Drain** • 6, 7 & 15 Roxby Court, Berwick **O'Shea's Rd Drain** • 26 & 155 Bemersyde Drive, Berwick • 8 Gifford Close, Berwick • 1 Lena Court, Berwick • 8 Maralee Court, Berwick **Princes Domain Drain** • 67-75 Wedgewood Road, Hallam **Troups Creek West Branch Drain** • 2 Ernst Wanke Road, Narre Warren North **Community Infrastructure Flooded** **O'Shea Road Drain** • Brentwood Park Preschool on Bemersyde Drive, Berwick at risk of flooding over-floor **Berwick Township Drain** • Parts of Berwick Shopping Precinct on corner of Princes Hwy and Clyde Road, Berwick • Mansfield Preschool on Mansfield Street, Berwick **Narre Warren Township Drain** • Parkhill Plaza on Parkhill Drive, Berwick • Timbarra Primary School on Beldale Court, Berwick **Troups Creek West Branch** • Mary MacKillop Catholic Primary School on Ernst Wanke Road, Narre Warren North **Hampton Park East Drain**	VicSES to respond as per request by request basis. Primary school to implement their emergency evacuation plan as required

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Parts of Hampton Park Shopping Centre on Hallam Road, Hampton Park **Water Over Road** **O'Shea Road Drain** • Bemersyde Drive, Berwick • Maralee Court, Berwick • Lena Court, Berwick **Berwick Township Drain** • Hazeldene Court, Berwick • McNabb Street, Berwick • Clyde Road, Berwick at Princes Highway • Mansfield Street, Berwick • Margaret Street, Berwick • Ambleside Crescent, Berwick • Daniher Close, Berwick • Collins Crescent, Berwick • Neagle Mews, Berwick • Watson Gardens, Berwick • Princes Hwy at Clyde Road **Berwick West Drain** • Timbarra Way, Berwick • Grant Close, Berwick • Argyle Court, Berwick • Wattlebird Court, Narre Warren • Sweeney Drive, Narre Warren at Wattlebird Court **Narre Warren Township Drain** • Ernst Wanke Road, Berwick at Bluebird Drive **Troups Creek West Branch** • Murray Way, Narre Warren • Jands Close, Narre Warren • Marson Crescent, Hallam **Princes Domain Drain** • Wedgewood Road, Hallam • Conquest Way, Hallam **Hampton Park East Drain**	Council to provide road closure signage if required.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Hallam Road, Hampton Park at Somerville Road • Leonne Court, Hampton Park • Village Drive, Hampton Park • Pound Road, Hampton Park between Verona Drive and Oaktree Drive • Narellan Drive, Hampton Park • Millswyn Avenue, Hampton Park • Manning Close, Hampton Park • Beckington Crescent, Hampton Park • Verona Drive, Hampton Park • Hazeldean Court, Hampton Park • Rene Place, Hampton Park • Harbury Mews, Hampton Park **Hampton Park West Drain** • Nola Court, Hampton Park • Robjant Street, Hampton Park at Mary Street • Mary Street, Hampton Park	
18mm in 10 mins; 29mm in 30 mins; 37mm in 1 hour; 49mm in 2 hours; 75mm in 6 hours; or 98mm 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.	2% AEP (50 year ARI)	**Properties at Flood Risk (Over-Floor)** **86 Properties in Total** **Berwick Township Drain** • 3, 5, 6, 7 & 48 Ambleside Crescent, Berwick • 2-12 & 3A Clyde Road, Berwick • 12, 16, 18, 20, 22, 24, 26, 28, 30 & 32 Collins Crescent, Berwick • 2, 1/4, 5, 7, 8, 9, 10, 11, 12, 13 & 14 Daniher Close, Berwick • 5 & 12 Hazeldene Court, Berwick • 2 High Street, Berwick • 2, 8 & 10 Mansfield Street, Berwick • 2, 6 & 8 Margaret Street, Berwick • 1, 3, 4 & 5 Patricia Court, Berwick **Fitzgerald Road Drain** • 25 & 27 Fitzgerald Road, Hallam • 10 & 14 Legend Court, Hallam • 10, 12, 31, 33 & 35 Marson Crescent, Hallam **Fordholm Rd East Drain** • 52 & 54 Cairns Road, Hampton Park	VicSES to respond as per request by request basis.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 10, 12 & 14 Hawking Avenue, Hampton Park • 36, 40, 42, 44 & 46 Ivan Crescent, Hampton Park • 10 & 12 Pride Court, Hampton Park • 2 & 3 Riley Place, Hampton Park **Hampton Park West Drain** • 30 & 32 Clive Street, Hampton Park • 2, 4 & 6 Karol Court, Hampton Park • 13, 15 & 17 Mark Court, Hampton Park • 8 & 12 Nola Court, Hampton Park • 18 Vanessa Drive, Hampton Park **Narre Warren Township Drain** • 5, 6, 7 & 15 Roxby Court, Berwick **O'Shea's Rd Drain** • 26, 153 & 155 Bemersyde Drive, Berwick • 8 Gifford Close, Berwick • 1 Lena Court, Berwick • 8 Maralee Court, Berwick **Princes Domain Drain** • 67-75 Wedgewood Road, Hallam **Troups Creek West Branch Drain** • 2 Ernst Wanke Road, Narre Warren North **Community Infrastructure Flooded** **O'Shea Road Drain** • Brentwood Park Preschool on Bemersyde Drive, Berwick at risk of flooding over-floor **Berwick Township Drain** • Parts of Berwick Shopping Precinct on corner of Princes Hwy and Clyde Road, Berwick • Mansfield Preschool on Mansfield Street, Berwick **Narre Warren Township Drain** • Parkhill Plaza on Parkhill Drive, Berwick • Timbarra Primary School on Beldale Court, Berwick **Troups Creek West Branch** • Mary MacKillop Catholic Primary School on Ernst Wanke Road, Narre Warren North **Hampton Park East Drain**	Primary school to implement their emergency evacuation plan as required

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Parts of Hampton Park Shopping Centre on Hallam Road, Hampton Park **Water Over Road** **O'Shea Road Drain** • Bemersyde Drive, Berwick • Maralee Court, Berwick • Lena Court, Berwick **Berwick Township Drain** • Hazeldene Court, Berwick • McNabb Street, Berwick • Clyde Road, Berwick at Princes Highway • Mansfield Street, Berwick • Margaret Street, Berwick • Ambleside Crescent, Berwick • Daniher Close, Berwick • Collins Crescent, Berwick • Neagle Mews, Berwick • Watson Gardens, Berwick • Princes Hwy at Clyde Road **Berwick West Drain** • Timbarra Way, Berwick • Grant Close, Berwick • Argyle Court, Berwick • Wattlebird Court, Narre Warren • Sweeney Drive, Narre Warren at Wattlebird Court **Narre Warren Township Drain** • Ernst Wanke Road, Berwick at Bluebird Drive **Troups Creek West Branch** • Murray Way, Narre Warren • Jands Close, Narre Warren • Marson Crescent, Hallam **Princes Domain Drain** • Wedgewood Road, Hallam • Conquest Way, Hallam **Hampton Park East Drain**	Council to provide road closure signage if required.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Hallam Road, Hampton Park at Somerville Road • Leonne Court, Hampton Park • Village Drive, Hampton Park • Pound Road, Hampton Park between Verona Drive and Oaktree Drive • Narellan Drive, Hampton Park • Millswyn Avenue, Hampton Park • Manning Close, Hampton Park • Beckington Crescent, Hampton Park • Verona Drive, Hampton Park • Hazeldean Court, Hampton Park • Rene Place, Hampton Park • Harbury Mews, Hampton Park **Hampton Park West Drain** • Nola Court, Hampton Park • Robjant Street, Hampton Park at Mary Street • Mary Street, Hampton Park	
21mm in 10 mins; 33mm in 30 mins; 42mm in 1 hour; 56mm in 2 hours; 85mm in 6 hours; or 111mm 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 (Over-Floor)** **106 Properties in Total** **Berwick Township Drain** • 3, 5, 6, 7, 19 & 48 Ambleside Crescent, Berwick • 2-12 & 3A Clyde Road, Berwick • 12, 14, 16, 18, 20, 22, 24, 25, 26, 28, 30 & 32 Collins Crescent, Berwick • 2, 1/4, 5, 7, 8, 9, 10, 11, 12, 13 & 14 Daniher Close, Berwick • 5 & 12 Hazeldene Court, Berwick • 2 High Street, Berwick • 2, 8, 10 & 29 Mansfield Street, Berwick • 2, 6 & 8 Margaret Street, Berwick • 1, 3, 4 & 5 Patricia Court, Berwick **Fitzgerald Road Drain** • 25 & 27 Fitzgerald Road, Hallam • 10 & 14 Legend Court, Hallam • 10, 12, 31, 33 & 35 Marson Crescent, Hallam **Fordholm Rd East Drain** • 52, 54 & 56 Cairns Road, Hampton Park	VicSES to respond as per request by request basis.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 10, 12 & 14 Hawking Avenue, Hampton Park • 34, 36, 40, 42, 44 & 46 Ivan Crescent, Hampton Park • 10 & 12 Pride Court, Hampton Park • 2 & 3 Riley Place, Hampton Park **Hampton Park East Drain** • 4/92, 94 & 96 Pound Road, Hampton Park **Hampton Park West Drain** • 30 & 32 Clive Street, Hampton Park • 149 Fordholm Road, Hampton Park • 2, 4, 5 & 6 Karol Court, Hampton Park • 13, 15 & 17 Mark Court, Hampton Park • 5, 8 & 12 Nola Court, Hampton Park • 2 Pound Road, Hampton Park • 18, 25 & 27 Vanessa Drive, Hampton Park **Narre Warren Township Drain** • 5, 6, 7 & 15 Roxby Court, Berwick **O'Shea's Rd Drain** • 26, 151, 153 & 155 Bemersyde Drive, Berwick • 8 Gifford Close, Berwick • 1 Lena Court, Berwick • 8, 9 & 10 Maralee Court, Berwick **Princes Domain Drain** • 67-75 Wedgewood Road, Hallam **Troups Creek East Branch Drain** • 52 Kurrajong Road, Narre Warren **Troups Creek West Branch Drain** • 2 Ernst Wanke Road, Narre Warren North **Community Infrastructure Flooded** **O'Shea Road Drain** • Brentwood Park Preschool on Bemersyde Drive, Berwick at risk of flooding over-floor **Berwick Township Drain** • Parts of Berwick Shopping Precinct on corner of Princes Hwy and Clyde Road, Berwick • Mansfield Preschool on Mansfield Street, Berwick	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Berwick South Drain • Sweeney Reserve at 70 Melzak Way, Berwick **Berwick West Drain** • Cyril Molyneux Reserve at 149-151l Mansfield Street, Berwick • Hessell Road Reserve at 95-115l Avebury Drive, Berwick **Narre Warren Township Drain** • Parkhill Plaza on Parkhill Drive, Berwick • Ryelands Drive Reserve at 147-157l Parkhill Drive, Berwick • Timbarra Primary School on Beldale Court, Berwick • Timbarra Park at 153-177 Ernst Wanke Road, Berwick **Troups Creek West Branch** • Coptic Hostel (Aged Care) at 18 St Kyrillos Place, Hallam • Mary MacKillop Catholic Primary School on Ernst Wanke Road, Narre Warren North • Kaiora Park at 42 Fox Road, Narre Warren North **Hampton Park East Drain** • Parts of Hampton Park Shopping Centre on Hallam Road, Hampton Park • River Gum Creek Linear Reserve at 24 Green Valley Crescent, Hampton Park **Hampton Park West Drain** • Marjorie Eastick Reserve at 9 Regans Road, Hampton Park **Essential Infrastructure Likely Impacted** **Berwick Township Drain** • Bus Routes 828, 838, 926 & 981 on Princes Hwy; 834 & 835 on Clyde Road and Mansfield Street **Hampton Park East Drain** • Bus Routes 892 & 894 on Pound Road; Routes 863, 891, 894, 895 & 982 on Hallam Road; Routes 892, 894 & 895 on Ormond Road; 895 on Amberly Drive; 894 on Kilberry Boulevard **Hampton Park West Drain** • Bus Route 849 on Vanessa Drive and Somerville Road **Narre Warren Township Drain** • Bus Route 839 on Parkhill Drive; & 847 on Centre Road **O'Shea's Road Drain** • Bus Routes 831 on Bemersyde Drive **Troups Creek West Branch** • Bus Route 835 on Ernst Wanke Road **Water Over Road** **O'Shea Road Drain**	Primary school to implement their emergency evacuation plan as required Council to provide road closure signage if required.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Bemersyde Drive, Berwick • Maralee Court, Berwick • Lena Court, Berwick • Tumut Court, Berwick • St.Boswells Avenue, Berwick • Carluke Close, Berwick **Berwick Township Drain** • Hazeldene Court, Berwick • McNabb Street, Berwick • Clyde Road, Berwick at Princes Highway • Mansfield Street, Berwick • Margaret Street, Berwick • Ambleside Crescent, Berwick • Daniher Close, Berwick • Collins Crescent, Berwick • Neagle Mews, Berwick • Watson Gardens, Berwick • Princes Hwy at Clyde Road **Berwick West Drain** • Timbarra Way, Berwick • Grant Close, Berwick • Argyle Court, Berwick • Wattlebird Court, Narre Warren • Sweeney Drive, Narre Warren at Wattlebird Court **Narre Warren Township Drain** • Ernst Wanke Road, Berwick at Bluebird Drive • Hagen Drive, Berwick **Troups Creek East Branch** • Kurrajong Road, Narre Warren at Oatlands Primary School • Murdoch Avenue, Narre Warren **Troups Creek West Branch** • Murray Way, Narre Warren • Jands Close, Narre Warren • Nita Close, Narre Warren	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Francine Court, Narre Warren • Dookie Court, Narre Warren • Marson Crescent, Hallam • Cardamon Drive, Hallam **Princes Domain Drain** • Wedgewood Road, Hallam • Conquest Way, Hallam **Hampton Park East Drain** • Godwin Crescent, Cranbourne North • General Joshua Drive, Hampton Park • Hallam Road, Hampton Park at Somerville Road • Leonne Court, Hampton Park • Village Drive, Hampton Park • Pound Road, Hampton Park between Verona Drive and Oaktree Drive • Narellan Drive, Hampton Park • Millswyn Avenue, Hampton Park • Manning Close, Hampton Park • Beckington Crescent, Hampton Park • Verona Drive, Hampton Park • Hazeldean Court, Hampton Park • Rene Place, Hampton Park • Harbury Mews, Hampton Park • Ormond Road, Hampton Park **Hampton Park West Drain** • Nola Court, Hampton Park • Robjant Street, Hampton Park at Mary Street • Mary Street, Hampton Park	
86mm in 3 hours	4th February 2011 Rainfall Return Period 0.2% AEP (500 year ARI)	**Event Summary** • A number of properties flooded along Mary Street , Robjant Street & Karol Court in Hampton Park as floodwaters backed up along the South Gippsland Freeway • Narellan Drive, Hampton park impacted with many properties flooded along River Gum Creek (Hampton Park East Drain)	

Table C4.12 – Breakdown of possible consequences at various rainfall intensities around Berwick, Narre Warren, Hallam & Hampton Park with operational considerations

APPENDIX C5 – CRANBOURNE to LYNBROOK FLOOD EMERGENCY PLAN

OVERVIEW OF FLOODING CONSEQUENCES

Cranbourne and its neighbouring suburbs of Cranbourne North, Cranbourne West, Lynbrook and Lyndhurst lay on the fringe of Melbourne's metropolitan region, 40km southeast of Melbourne.

The drainage network is a mixture of open channels and underground drains, all passing through highly urbanised areas. Flood Mitigation Infrastructure in the area is in the form of five retarding basins and two pumping stations. The retarding basins vary in size and composition with two used as recreation/ sporting reserves (Fairbairn Road and Thompsons Road RB), two as constructed wetlands (Evans Road and Marriot Waters RB) and one small depression in a transmission line reserve (Monahans Road RB).

Located on Lyndhurst South D.S., Ayers Close Pump Station and Rachel Drive Pump Station are both Low flow/Retarding Basin pump out structures, in place to desilt and increase storage to reduce flood frequency.

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 Fairbairn Rd, Monahans Rd, & Lyndhurst South Drains

Property					
Properties	**30**				
Residential	30				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	2	Cranbourne World of Learning; & Cranbourne Community House
Care Facilities	0		Community Venues	2	Cranbourne Homemaker Centre; & Sandhurst Shopping Centre
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	1	St Peters College	Prisons	0	
Essential Infrastructure					
Major Roads	2	South Gippsland Hwy; & Thompsons Rd	Police Stations	0	
Major Rail	1	Cranbourne Railway Line at Merinda Park Station	Government Buildings	0	
Bus Routes	10	791; 795; 796; 798; 799; 841; 893; 897; 898; & 982	Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	0		Drainage Facilities	7	5 Retarding Basins; & 2 Pumping Stations
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	2	Lawson Poole Reserve; & J&P Cam Reserve	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Frankston; & Greater Dandenong	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C5.1 – Consequence Summary of 1% AEP flood along the Fairbairn Rd, Monahans Rd & Lyndhurst South Drains

WARNING TIMES

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

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Tide Gauge	Melway Ref
Cranbourne	586375	At Botanical Gardens Office, Wylies Creek Trk		✓		133 E12
Eastern Contour Drain, Lyndhurst	228233A	Glasscocks Road, Lyndhurst	✓			128 E3

Table C5.2 – Hydrographic Monitoring Stations around Cranbourne and Lynbrook

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. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/ and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

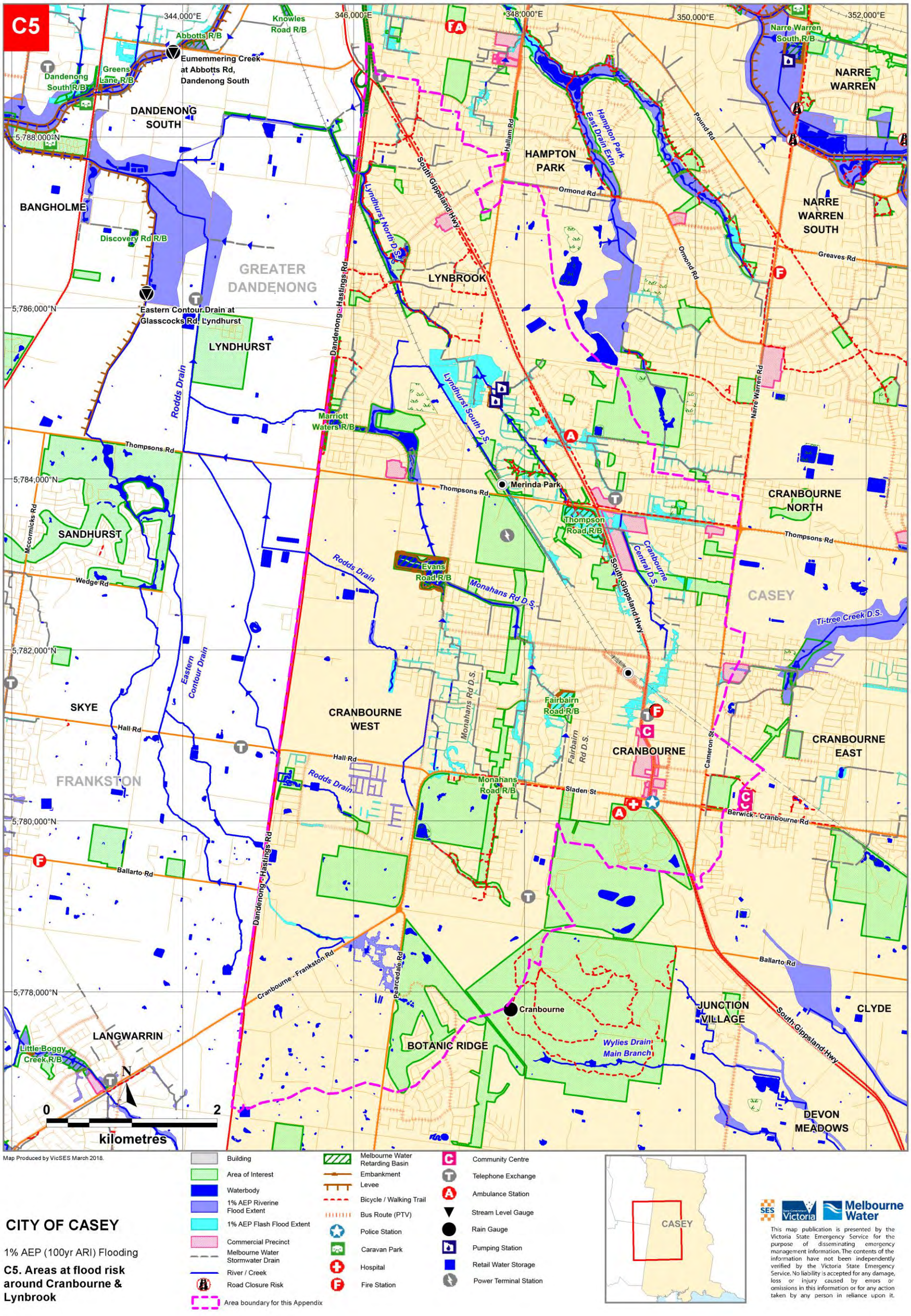

Figure C5 – Areas of flood risk around Cranbourne, Cranbourne West and Lynbrook in the City of Casey

PROPERTIES AT FLOOD RISK

Properties listed in the table below are at risk from flooding around Cranbourne, Cranbourne West and Lynbrook. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Cranbourne Central D.S. (AECOM, July 2011), Monahans Rd D.S. (CMPS&F Pty Ltd, February 1998) and the Lyndhurst South D.S. (WBM, October 2000) 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 Over-Floor along the Fairbairn Rd, Monahans Rd & Lyndhurst South Drains

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 Allemby Drive	Cranbourne West	Monahans Road Drain	Flash
		✓	18 Allemby Drive	Cranbourne West	Monahans Road Drain	Flash
		✓	20 Allemby Drive	Cranbourne West	Monahans Road Drain	Flash
✓	✓	✓	21 Darcy Court	Cranbourne	Lyndhurst South Drain	Flash
✓	✓	✓	2/22 Darcy Court	Cranbourne	Lyndhurst South Drain	Flash
		✓	3 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
	✓	✓	5 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
✓	✓	✓	7 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
✓	✓	✓	14 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
	✓	✓	18 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
		✓	20 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
	✓	✓	22 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
✓	✓	✓	26 Elcan Avenue	Cranbourne West	Monahans Road Drain	Flash
		✓	15 Elizabeth Street	Cranbourne North	Lyndhurst South Drain	Flash
✓	✓	✓	3 Gipps Crescent	Cranbourne North	Lyndhurst South Drain	Flash
✓	✓	✓	5 Gipps Crescent	Cranbourne North	Lyndhurst South Drain	Flash
✓	✓	✓	7 Gipps Crescent	Cranbourne North	Lyndhurst South Drain	Flash
✓	✓	✓	15 Lachlan Close	Cranbourne North	Lyndhurst South Drain	Flash
✓	✓	✓	17 Lachlan Close	Cranbourne North	Lyndhurst South Drain	Flash
✓	✓	✓	19 Lachlan Close	Cranbourne North	Lyndhurst South Drain	Flash
		✓	83 Monahans Road	Cranbourne West	Monahans Road Drain	Flash
		✓	167 Monahans Road	Cranbourne West	Monahans Road Drain	Flash
		✓	173 Monahans Road	Cranbourne West	Monahans Road Drain	Flash
	✓	✓	26 Strafford Avenue	Cranbourne	Lyndhurst South Drain	Flash
		✓	30 Strafford Avenue	Cranbourne	Lyndhurst South Drain	Flash
✓	✓	✓	1 Susan Court	Cranbourne	Fairbairn Road Drain	Flash
	✓	✓	19 Todd Court	Cranbourne West	Monahans Road Drain	Flash
	✓	✓	44 Valepark Crescent	Cranbourne	Fairbairn Road Drain	Flash
✓	✓	✓	45 Valepark Crescent	Cranbourne	Fairbairn Road Drain	Flash
	✓	✓	47 Valepark Crescent	Cranbourne	Fairbairn Road Drain	Flash

Totals		
13	20	30

Table C5.3 – Properties at risk of flooding around Cranbourne, Cranbourne West & Lyndhurst in the City of Casey.

ISOLATION

Cranbourne and the townships to the south may become isolated from Narre Warren and the northern suburbs for a period during an intense rainfall event if Narre Warren-Cranbourne Rd, Hallam Rd, Clyde Rd & the South Gippsland Freeway all become inundated and closed to traffic. No other major isolation risks exist for areas around Cranbourne, Cranbourne North and Cranbourne West during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

ESSENTIAL INFRASTRUCTURE

The **Cranbourne Train Line** at Merinda Park Station is at risk of flooding during a 1% AEP flood event.

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 City of Casey is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/9_Casey_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Cranbourne, Cranbourne North and Cranbourne West 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 Cranbourne, Cranbourne North and Cranbourne West. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

VicRoads Roads flooded in a 1% AEP (100yr ARI) event
• South Gippsland Highway, Cranbourne, northbound between Rose Street and Thompsons Road
• Thompsons Road, Cranbourne, between Rosebank Drive and Rapallo Way

Table C5.4 – VicRoads Possible Road Closures during a flooding event

Casey City Council Roads flooded in a 1% AEP (100yr ARI) event			
CRANBOURNE	• Springhill Drive	• Endeavour Drive	**CRANBOURNE WEST**
• Alexander Street	• Station Street	• Filomena Court	• Allemby Drive
• Averne Street	• Strafford Avenue	• Frances Crescent	• Breamlea Way
• Camms Road	• Toirram Crescent	• Heywood Crescent	• Central Parkway
• Canterbury Road	• Walter Street	• Hoystead Avenue	• Merribah Way
• Cleopatra Drive	• William Street	• Huon Park Road	• Monahans Road
• High Street (slip)	**CRANBOURNE NORTH**	• Stirling Avenue	• Navarre Drive
• Loch Street	• Cheshunt Court	• Strzelecki Court	
• Normanby Street	• Elda Court	• Wentworth Street	
• Pepperbush Circuit	• Elizabeth Street		

Table C5.5 – Casey City Council Possible Road Closures during a flooding event

FLOOD MITIGATION

RETARDING BASINS

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Evans Road	Monahans Road Drain / Cranbourne Outfall Drain	90,183m^2	292.5ML	26.55m AHD	27.1m AHD	27.1m AHD	High C	10	129 C11
Fairbairn Road	Fairbairn Road Drain	63,520m^2	82.8ML	Unavailable	44.6m AHD	45m AHD	High C	Unavailable	133 G3
Marriot Waters	Cranbourne Outfall Drain	39,965m^2	115ML	N/A	Unavailable	N/A (In-cut)	Very Low	0	128 K7
Monahans Road	Monahans Road Drain	2,590m^2	5.4ML	32.1m AHD	Unavailable	33m AHD	Very Low	0	133 E5
Thompson Road	Cranbourne Central Drain	94,180m^2	105.9ML	N/A	32.1m AHD	33m AHD	High A	Unavailable	129 H10

Table C5.6 – Melbourne Water Retarding Basins around Cranbourne, Cranbourne West & Lynbrook in the City of Casey

PUMPING STATIONS

Melbourne Water Pumping Station	On Drain / Waterway	Location	No. of Pumps	Capacity	Trigger Levels (Start and Stop)	Melway Reference
Ayers Close PS	Lyndhurst South D.S.	Adjacent to outfall drain, Ayers Close, Lynbrook	1	Pump 1: Unknown	Pump 1: Unknown	129 E6
Rachel Drive PS	Lyndhurst South D.S.	NW corner of Reserve, Rachel Drive, Lynbrook	1	Pump 1: Unknown	Pump 1: Unknown	129 E6

Table C5.6 – Melbourne Water Pumping Stations along the Lyndhurst South Drain

LEVEES

No formal Levees exist around Cranbourne West and Cranbourne.

COMMAND, CONTROL & 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 Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

FLOOD IMPACTS & OPERATIONAL CONSIDERATIONS (INTELLIGENCE CARDS)

The table on the following pages provide a breakdown of the possible consequences of flooding around Cranbourne, Cranbourne West & Lynbrook at 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:

- Cranbourne, Cranbourne West & Lynbrook

FLOOD INTELLIGENCE CARD – CRANBOURNE, CRANBOURNE WEST & LYNBROOK (UNGAUGED)

Version 3 – March 2018

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	**Cranbourne Rain Gauge**
LOCATION	**Botanical Gardens Office, Cranbourne**
MELWAY REF:	**113 E12**

GAUGE NUMBER	**586375**
GAUGE TYPE	**Rain**
TELEMETRIC/MANUAL	**Telemetric**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
14mm in 10 mins; 24mm in 30 mins; 30mm in 1 hour; 40mm in 2 hours; 60mm in 6 hours; or 77mm 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.	5% AEP (20 year ARI)	**Properties at Flood Risk (Over-Floor)** **13 Properties in Total** • **Fairbairn Road Drain** • 1 Susan Court, Cranbourne • 45 Valepark Crescent, Cranbourne • **Lyndhurst South Drain** • 21 & 2/22 Darcy Court, Cranbourne • 3, 5 & 7 Gipps Crescent, Cranbourne North • 15, 17 & 19 Lachlan Close, Cranbourne North • **Monahans Road Drain** • 7, 14 & 26 Elcan Avenue, Cranbourne West **Community Infrastructure Flooded** **Cranbourne Central D.S.** • Lawson Poole Reserve, Thompsons Road, Cranbourne **Essential Infrastructure Impacted** • South Gippsland Highway, Cranbourne, opposite Cranbourne Homemaker Centre	VicSES to respond as per request by request basis.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Water Over Road **Cranbourne Central D.S.** • Camms Road, Cranbourne • Canterbury Street, Cranbourne • Elda Court, Cranbourne North • Frances Crescent, Cranbourne North • Heywood Crescent, Cranbourne North • High Street slip lane, Cranbourne • Loch Street, Cranbourne • Normanby Street, Cranbourne • South Gippsland Highway, Cranbourne • Station Street, Cranbourne • Thompsons Road, Cranbourne • Walter Street, Cranbourne • William Street, Cranbourne	Council to provide road closure signage if required.
18mm in 10 mins; 29mm in 30 mins; 37mm in 1 hour; 48mm in 2 hours; 72mm in 6 hours; or 93mm 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.	2% AEP (50 year ARI)	**Properties at Flood Risk (Over-Floor)** **20 Properties in Total** • **Fairbairn Road Drain** • 1 Susan Court, Cranbourne • 44, 45 & 47 Valepark Crescent, Cranbourne • **Lyndhurst South Drain** • 21 & 2/22 Darcy Court, Cranbourne • 3, 5 & 7 Gipps Crescent, Cranbourne North • 15, 17 & 19 Lachlan Close, Cranbourne North • 26 Strafford Avenue, Cranbourne • **Monahans Road Drain** • 5, 7, 14, 18, 22 & 26 Elcan Avenue, Cranbourne West • 19 Todd Court, Cranbourne West **Community Infrastructure Flooded** **Cranbourne Central D.S.** • Lawson Poole Reserve, Thompsons Road, Cranbourne • Great Southern Home Centre (parking area), Thompsons Road, Cranbourne **Essential Infrastructure Impacted** • South Gippsland Highway, Cranbourne, opposite Cranbourne Homemaker Centre	VicSES to respond as per request by request basis.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Water Over Road **Cranbourne Central D.S.** • Alexander Street, Cranbourne • Camms Road, Cranbourne • Canterbury Street, Cranbourne • Elda Court, Cranbourne North • Frances Crescent, Cranbourne North • Heywood Crescent, Cranbourne North • High Street slip lane, Cranbourne • Loch Street, Cranbourne • Normanby Street, Cranbourne • South Gippsland Highway, Cranbourne • Station Street, Cranbourne • Thompsons Road, Cranbourne • Walter Street, Cranbourne • William Street, Cranbourne	Council to provide road closure signage if required.
21mm in 10 mins; 33mm in 30 mins; 42mm in 1 hour; 54mm in 2 hours; 81mm in 6 hours; or 105mm 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 (above floor level)** **30 Properties in Total** • **Fairbairn Road Drain** • 1 Susan Court, Cranbourne • 44, 45 & 47 Valepark Crescent, Cranbourne • **Lyndhurst South Drain** • 21 & 2/22 Darcy Court, Cranbourne • 15 Elizabeth Street, Cranbourne North • 3, 5 & 7 Gipps Crescent, Cranbourne North • 15, 17 & 19 Lachlan Close, Cranbourne North • 26 & 30 Strafford Avenue, Cranbourne • **Monahans Road Drain** • 8, 18 & 20 Allemby Drive, Cranbourne West • 3, 5, 7, 14, 18, 20, 22 & 26 Elcan Avenue, Cranbourne West • 83, 167 & 173 Monahans Road, Cranbourne West • 19 Todd Court, Cranbourne West **Community Infrastructure Flooded** **Cranbourne Central D.S.**	VicSES to respond as per request by request basis.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Lawson Poole Reserve, Thompsons Road, Cranbourne • Cranbourne World Of Learning (Child Care) at 24-26 Walter Street, Cranbourne • Cranbourne Homemaker Centre Carpark, Thompsons Road, Cranbourne **Fairbairn Road D.S.** • Cranbourne Community House (Kindergarten), Valepark Crescent, Cranbourne • J&P Cam Reserve, Fairbairn Road, Cranbourne. **Monahans Road D.S.** • Sandhurst Shopping Centre on Monahans Road, Cranbourne West • St Peters College, Cranbourne-Frankston Road, Cranbourne West, oval flooded **Essential Infrastructure Impacted** • Cranbourne Train Line at Merinda Park Station at risk of flooding • South Gippsland Highway, Cranbourne, opposite Cranbourne Homemaker Centre **Water Over Road** **Cranbourne Central D.S.** • Alexander Street, Cranbourne • Averne Street, Cranbourne • Camms Road, Cranbourne • Canterbury Street, Cranbourne • Cleopatra Drive, Cranbourne • Elda Court, Cranbourne North • Filomena Court, Cranbourne North • Frances Crescent, Cranbourne North • Heywood Crescent, Cranbourne North • High Street slip lane, Cranbourne • Hoystead Avenue, Cranbourne North • Loch Street, Cranbourne • Normanby Street, Cranbourne • Pepperbush Circuit, Cranbourne • South Gippsland Highway, Cranbourne • Springhill Drive, Cranbourne • Station Street, Cranbourne • Thompsons Road, Cranbourne • Walter Street, Cranbourne • William Street, Cranbourne	Kindergarten to implement their emergency evacuation plan as required. Council to provide road closure signage if required.

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Lyndhurst South D.S. • Cheshunt Court, Cranbourne North • Elizabeth Street, Cranbourne North • Endeavour Drive, Cranbourne North • Hoystead Avenue, Cranbourne North • Huon Park Road, Cranbourne North • Stirling Avenue, Cranbourne North • Strafford Avenue, Cranbourne • Strzelecki Court, Cranbourne North • Toirram Crescent, Cranbourne • Wentworth Street, Cranbourne North **Monahans Road D.S.** • Allemby Drive, Cranbourne West • Bramlea Way, Cranbourne West • Central Parkway, Cranbourne West • Merrimbah Way, Cranbourne West • Monahans Road, Cranbourne West • Navarre Drive, Cranbourne West	

Table C5.7 – Breakdown of possible consequences at various rainfall intensities around Cranbourne, Cranbourne West & Lynbrook with operational considerations

APPENDIX C6 – WESTERNPORT BAY FLOOD EMERGENCY PLAN

OVERVIEW OF FLOODING CONSEQUENCES

Tooradin, Cannons Creek and Warneet are rural towns approximately 55km southeast of Melbourne on the northern shore of the Western Port Bay. Tooradin is situated at the mouths of the Muddy Waters and Tooradin Rd Drains which work their way down south from Ballarto Rd, Clyde across the Southern Floodplains of the City of Casey. Tooradin and the surrounding area is located within a floodplain meaning very flat terrain ranging from sea-level to approximately 5m AHD. The result of this expanse of flat terrain is slow moving water and wide flood extents which have the potential to persist for days before receding into the Western Port Bay.

Rising tide levels from Wester Port Bay as a result of Storm-Surge are a risk for the area. A gauge at Tooradin measures tide level. During a Storm Surge event, a number of residential properties in Tooradin are at risk of flooding along with the South Gippsland Highway at Rutter Park Reserve. For more information into flooding in the area, see mapping in Appendix F.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along the Western Port Bay

Property					
Properties	**292**				
Residential	215				
Commercial	21				
Industrial	0				
Public Land	3				
Rural	53				
Community Infrastructure					
Health Facilities	0		Child Care / Kindergartens	1	Tooradin Kindergarten
Care Facilities	0		Community Venues	0	
Retirement Villages	0		Places of Worship	0	
Schools / Colleges	1	Tooradin Primary School	Prisons	0	
Essential Infrastructure					
Major Roads	1	South Gippsland Hwy	Police Stations	0	
Major Rail	0		Government Buildings	0	
Bus Routes	2	795 & V/Line Cowes or Inverloch	Sewerage Facilities	0	
Power Facility	0		Levees	0	
Comms Services	1	Warneet Telephone Exchange	Drainage Facilities	0	
Emergency Services	0		Airports / Airfields	0	
Tourism / Recreation					
Sports Facilities	0		Caravan Parks	0	
Recreation Facilities	2	Tooradin Recreation Reserve; & Rutter Park Reserve	Camping Grounds	0	
Government Boundaries					
Local Gov't Areas	1	Casey	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Cardinia; & Mornington Peninsula	CFA District	1	District 08
SES Resp' Boundary	1	Narre Warren	MFB District	0	

Table C6.1 – Consequence Summary of 1% AEP flood around the Western Port Bay

WARNING TIMES

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.

Melbourne Water Hydrographic Monitoring Station	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Tide Gauge	Melway Ref
Cardinia Creek, Cardinia	228228A	Western bank of the creek at Chasemore Rd, Clyde North	✓	✓		Key 14 P15
Cranbourne	586375	At Botanical Gardens Office, Wylies Creek Trk		✓		133 E12
Tooradin	288399A	Evans Inlet, Tooradin			✓	144 A6

Table C6.2 – Hydrographic Monitoring Stations close to Westernport Bay

Flooding around Tooradin is predominantly due flooding of the Tooradin Road Drain and Muddy Gates Drain, both of which lack upstream gauges. Cardinia Creek may contribute to flooding in Tooradin or give an indication to expected flooding. For information on Cardinia Creek gauges, refer to the Cardinia Municipal Flood Emergency Plan. The above 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. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/ and the VicEmergency website https:/emergency.vic.gov.au/ for any thunderstorm, flood or severe weather warnings present for their area.

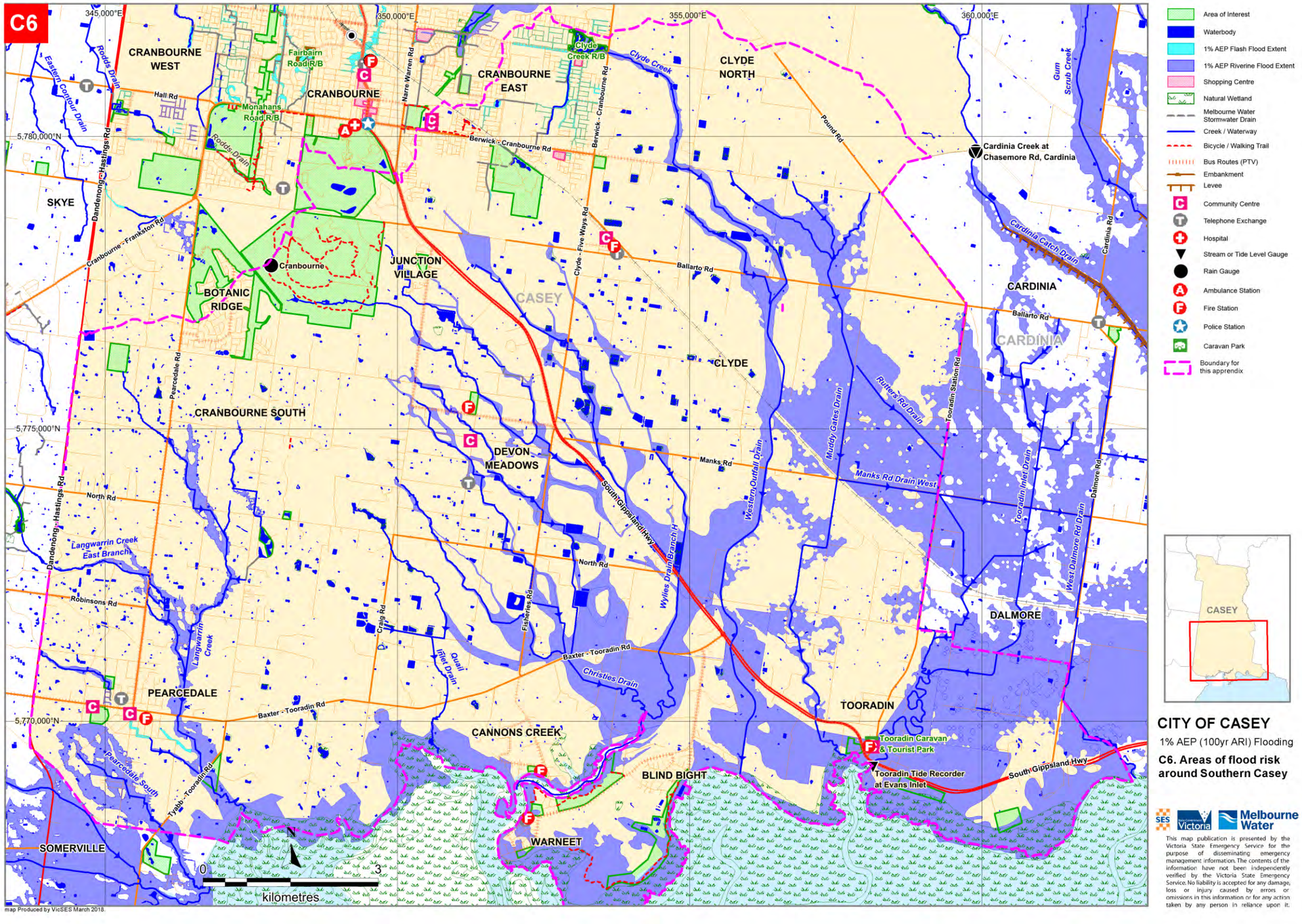

Figure C6 – Areas of flood risk around Tooradin, Cannons Creek and Warneet in the City of Casey

PROPERTIES AT FLOOD RISK

Properties listed in the table below are at risk from flooding around Westernport Bay in Casey. As more intelligence becomes available, this list may change.

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Properties at risk from Flooding around Westernport Bay during a 1% AEP event

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
1	Anebo Street	Warneet	Western Port Bay	Coastal
2	Anebo Street	Warneet	Western Port Bay	Coastal
3	Anebo Street	Warneet	Western Port Bay	Coastal
5	Anebo Street	Warneet	Western Port Bay	Coastal
7	Anebo Street	Warneet	Western Port Bay	Coastal
25	Arthur Ayres Road	Tooradin	Western Port Bay	Coastal
35	Arthur Ayres Road	Tooradin	Western Port Bay	Coastal
3	Bakewell Street	Tooradin	Western Port Bay	Coastal
4	Bakewell Street	Tooradin	Western Port Bay	Coastal
5	Bakewell Street	Tooradin	Western Port Bay	Coastal
6	Bakewell Street	Tooradin	Western Port Bay	Coastal
7	Bakewell Street	Tooradin	Western Port Bay	Coastal
9	Bakewell Street	Tooradin	Western Port Bay	Coastal
10	Bakewell Street	Tooradin	Western Port Bay	Coastal
12	Bakewell Street	Tooradin	Western Port Bay	Coastal
14	Bakewell Street	Tooradin	Western Port Bay	Coastal
16	Bakewell Street	Tooradin	Western Port Bay	Coastal
18	Bakewell Street	Tooradin	Western Port Bay	Coastal
20	Bakewell Street	Tooradin	Western Port Bay	Coastal
22	Bakewell Street	Tooradin	Western Port Bay	Coastal
26	Bakewell Street	Tooradin	Western Port Bay	Coastal
26A	Bakewell Street	Tooradin	Western Port Bay	Coastal
27	Bakewell Street	Tooradin	Western Port Bay	Coastal
28	Bakewell Street	Tooradin	Western Port Bay	Coastal
29	Bakewell Street	Tooradin	Western Port Bay	Coastal
13	Balaka Street	Warneet	Western Port Bay	Coastal
15	Balaka Street	Warneet	Western Port Bay	Coastal
16	Balaka Street	Warneet	Western Port Bay	Coastal
17	Balaka Street	Warneet	Western Port Bay	Coastal
18	Balaka Street	Warneet	Western Port Bay	Coastal
19	Balaka Street	Warneet	Western Port Bay	Coastal
21	Balaka Street	Warneet	Western Port Bay	Coastal
23	Balaka Street	Warneet	Western Port Bay	Coastal
25	Balaka Street	Warneet	Western Port Bay	Coastal
27	Balaka Street	Warneet	Western Port Bay	Coastal
29	Balaka Street	Warneet	Western Port Bay	Coastal

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

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
31	Balaka Street	Warneet	Western Port Bay	Coastal
33	Balaka Street	Warneet	Western Port Bay	Coastal
1	Banks Street	Warneet	Western Port Bay	Coastal
2	Banks Street	Warneet	Western Port Bay	Coastal
4	Banks Street	Warneet	Western Port Bay	Coastal
5	Banks Street	Warneet	Western Port Bay	Coastal
7	Banks Street	Warneet	Western Port Bay	Coastal
9	Banks Street	Warneet	Western Port Bay	Coastal
11	Banks Street	Warneet	Western Port Bay	Coastal
13	Banks Street	Warneet	Western Port Bay	Coastal
15	Banks Street	Warneet	Western Port Bay	Coastal
5	Bayview Road	Tooradin	Western Port Bay	Coastal
9	Bayview Road	Tooradin	Western Port Bay	Coastal
14	Bayview Road	Tooradin	Western Port Bay	Coastal
16	Bayview Road	Tooradin	Western Port Bay	Coastal
18-20	Bayview Road	Tooradin	Western Port Bay	Coastal
22-24	Bayview Road	Tooradin	Western Port Bay	Coastal
23	Bayview Road	Tooradin	Western Port Bay	Coastal
26	Bayview Road	Tooradin	Western Port Bay	Coastal
28-30	Bayview Road	Tooradin	Western Port Bay	Coastal
67	Bayview Road	Tooradin	Western Port Bay	Coastal
69	Bayview Road	Tooradin	Western Port Bay	Coastal
71	Bayview Road	Tooradin	Western Port Bay	Coastal
73	Bayview Road	Tooradin	Western Port Bay	Coastal
75	Bayview Road	Tooradin	Western Port Bay	Coastal
79-81	Bayview Road	Tooradin	Western Port Bay	Coastal
45	Billingsley Road	Tooradin	Western Port Bay	Coastal
55A	Billingsley Road	Tooradin	Western Port Bay	Coastal
1	Bungadool Street	Warneet	Western Port Bay	Coastal
3	Bungadool Street	Warneet	Western Port Bay	Coastal
4	Cannons Creek Road	Cannons Creek	Western Port Bay	Coastal
1	Cooinda Street	Warneet	Western Port Bay	Coastal
2	Cooinda Street	Warneet	Western Port Bay	Coastal
18A	Culgoa Street	Warneet	Western Port Bay	Coastal
22	Culgoa Street	Warneet	Western Port Bay	Coastal
24	Culgoa Street	Warneet	Western Port Bay	Coastal
30	Culgoa Street	Warneet	Western Port Bay	Coastal
2	Cygnet Street	Tooradin	Western Port Bay	Coastal
75	Dalmore Road	Tooradin	Western Port Bay	Coastal
3-5	Elimatta Street	Warneet	Western Port Bay	Coastal
7	Elimatta Street	Warneet	Western Port Bay	Coastal
8	Elimatta Street	Warneet	Western Port Bay	Coastal
10	Elimatta Street	Warneet	Western Port Bay	Coastal
18	Elimatta Street	Warneet	Western Port Bay	Coastal

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

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
19	Elimatta Street	Warneet	Western Port Bay	Coastal
21	Elimatta Street	Warneet	Western Port Bay	Coastal
23	Elimatta Street	Warneet	Western Port Bay	Coastal
15	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
17	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
19	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
23	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
25	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
41A	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
54	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
56	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
57	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
58	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
59	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
60	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
61	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
62	Glenalva Parade	Cannons Creek	Western Port Bay	Coastal
13	Gnoorong Street	Warneet	Western Port Bay	Coastal
20	Gnoorong Street	Warneet	Western Port Bay	Coastal
21	Gnoorong Street	Warneet	Western Port Bay	Coastal
22	Gnoorong Street	Warneet	Western Port Bay	Coastal
23	Gnoorong Street	Warneet	Western Port Bay	Coastal
24	Gnoorong Street	Warneet	Western Port Bay	Coastal
25	Gnoorong Street	Warneet	Western Port Bay	Coastal
26	Gnoorong Street	Warneet	Western Port Bay	Coastal
11	Hardy Avenue	Cannons Creek	Western Port Bay	Coastal
13	Hardy Avenue	Cannons Creek	Western Port Bay	Coastal
15	Hardy Avenue	Cannons Creek	Western Port Bay	Coastal
17	Hardy Avenue	Cannons Creek	Western Port Bay	Coastal
19	Hardy Avenue	Cannons Creek	Western Port Bay	Coastal
40	Hardys Road	Tooradin	Western Port Bay	Coastal
80	Hardys Road	Tooradin	Western Port Bay	Coastal
90	Hardys Road	Tooradin	Western Port Bay	Coastal
110	Hardys Road	Tooradin	Western Port Bay	Coastal
190	Hardys Road	Tooradin	Western Port Bay	Coastal
260	Hardys Road	Tooradin	Western Port Bay	Coastal
1	Harewood Street	Tooradin	Western Port Bay	Coastal
2	Harewood Street	Tooradin	Western Port Bay	Coastal
4	Harewood Street	Tooradin	Western Port Bay	Coastal
6	Harewood Street	Tooradin	Western Port Bay	Coastal
7	Harewood Street	Tooradin	Western Port Bay	Coastal
8	Harewood Street	Tooradin	Western Port Bay	Coastal
9	Harewood Street	Tooradin	Western Port Bay	Coastal
10	Harewood Street	Tooradin	Western Port Bay	Coastal

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

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
11	Harewood Street	Tooradin	Western Port Bay	Coastal
12	Harewood Street	Tooradin	Western Port Bay	Coastal
13	Harewood Street	Tooradin	Western Port Bay	Coastal
14	Harewood Street	Tooradin	Western Port Bay	Coastal
15	Harewood Street	Tooradin	Western Port Bay	Coastal
16	Harewood Street	Tooradin	Western Port Bay	Coastal
17	Harewood Street	Tooradin	Western Port Bay	Coastal
18	Harewood Street	Tooradin	Western Port Bay	Coastal
19	Harewood Street	Tooradin	Western Port Bay	Coastal
20	Harewood Street	Tooradin	Western Port Bay	Coastal
21	Harewood Street	Tooradin	Western Port Bay	Coastal
22	Harewood Street	Tooradin	Western Port Bay	Coastal
23	Harewood Street	Tooradin	Western Port Bay	Coastal
24	Harewood Street	Tooradin	Western Port Bay	Coastal
26	Harewood Street	Tooradin	Western Port Bay	Coastal
28	Harewood Street	Tooradin	Western Port Bay	Coastal
115	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
130	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
140	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
170	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
175	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
195	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
200	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
210	Harewood Mains Road	Tooradin	Western Port Bay	Coastal
4	Iluka Street	Warneet	Western Port Bay	Coastal
6	Iluka Street	Warneet	Western Port Bay	Coastal
40	Inlet Parade	Tooradin	Western Port Bay	Coastal
50	Inlet Parade	Tooradin	Western Port Bay	Coastal
19	Kallara Road	Warneet	Western Port Bay	Coastal
25	Kallara Road	Warneet	Western Port Bay	Coastal
27	Kallara Road	Warneet	Western Port Bay	Coastal
4	Lyall Street	Tooradin	Western Port Bay	Coastal
6	Lyall Street	Tooradin	Western Port Bay	Coastal
19	Lyall Street	Tooradin	Western Port Bay	Coastal
21	Lyall Street	Tooradin	Western Port Bay	Coastal
24	Lyall Street	Tooradin	Western Port Bay	Coastal
26	Lyall Street	Tooradin	Western Port Bay	Coastal
28	Lyall Street	Tooradin	Western Port Bay	Coastal
2-5I	Lyne Street	Tooradin	Western Port Bay	Coastal
7	Lyne Street	Tooradin	Western Port Bay	Coastal
8	Lyne Street	Tooradin	Western Port Bay	Coastal
10	Matthew Street	Tooradin	Western Port Bay	Coastal
11	Matthew Street	Tooradin	Western Port Bay	Coastal
12	Matthew Street	Tooradin	Western Port Bay	Coastal

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

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
13	Matthew Street	Tooradin	Western Port Bay	Coastal
14	Matthew Street	Tooradin	Western Port Bay	Coastal
16	Matthew Street	Tooradin	Western Port Bay	Coastal
18	Matthew Street	Tooradin	Western Port Bay	Coastal
4	Mickle Street	Tooradin	Western Port Bay	Coastal
13	Mickle Street	Tooradin	Western Port Bay	Coastal
15	Mickle Street	Tooradin	Western Port Bay	Coastal
2/17	Mickle Street	Tooradin	Western Port Bay	Coastal
4/17	Mickle Street	Tooradin	Western Port Bay	Coastal
19	Mickle Street	Tooradin	Western Port Bay	Coastal
21	Mickle Street	Tooradin	Western Port Bay	Coastal
22	Mickle Street	Tooradin	Western Port Bay	Coastal
23	Mickle Street	Tooradin	Western Port Bay	Coastal
25	Mickle Street	Tooradin	Western Port Bay	Coastal
26	Mickle Street	Tooradin	Western Port Bay	Coastal
27	Mickle Street	Tooradin	Western Port Bay	Coastal
28	Mickle Street	Tooradin	Western Port Bay	Coastal
1/30-32	Mickle Street	Tooradin	Western Port Bay	Coastal
5	Monomeith Street	Tooradin	Western Port Bay	Coastal
7	Monomeith Street	Tooradin	Western Port Bay	Coastal
9	Monomeith Street	Tooradin	Western Port Bay	Coastal
11	Monomeith Street	Tooradin	Western Port Bay	Coastal
20	Monomeith Street	Tooradin	Western Port Bay	Coastal
21	Monomeith Street	Tooradin	Western Port Bay	Coastal
25	Monomeith Street	Tooradin	Western Port Bay	Coastal
30	Monomeith Street	Tooradin	Western Port Bay	Coastal
31	Monomeith Street	Tooradin	Western Port Bay	Coastal
35	Monomeith Street	Tooradin	Western Port Bay	Coastal
40	Monomeith Street	Tooradin	Western Port Bay	Coastal
1	Peters Street	Cannons Creek	Western Port Bay	Coastal
3	Peters Street	Cannons Creek	Western Port Bay	Coastal
5-7	Peters Street	Cannons Creek	Western Port Bay	Coastal
1	Rigby Street	Warneet	Western Port Bay	Coastal
34	Rutherford Parade	Warneet	Western Port Bay	Coastal
38	Rutherford Parade	Warneet	Western Port Bay	Coastal
40	Rutherford Parade	Warneet	Western Port Bay	Coastal
66	Rutherford Parade	Warneet	Western Port Bay	Coastal
68	Rutherford Parade	Warneet	Western Port Bay	Coastal
70	Rutherford Parade	Warneet	Western Port Bay	Coastal
1/72	Rutherford Parade	Warneet	Western Port Bay	Coastal
74	Rutherford Parade	Warneet	Western Port Bay	Coastal
76	Rutherford Parade	Warneet	Western Port Bay	Coastal
78	Rutherford Parade	Warneet	Western Port Bay	Coastal
80	Rutherford Parade	Warneet	Western Port Bay	Coastal

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

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
62-68	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
71	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
85	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
87	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
90	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
1/92	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
2/92	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
94	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
96	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
98	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
100	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
101	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
102	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
103	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
104-106	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
105-107	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
1/106	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
3/106	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
2/106	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
108	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
112	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
114	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
115-117	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
116	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
118	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
120A	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
120	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
122	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
124	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
126	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
127	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
128	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
129-135	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
130	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
137	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
139	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
141	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
143	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
145	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
147	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
151	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
153	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
155	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
157	South Gippsland Highway	Tooradin	Western Port Bay	Coastal

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

Street No. at Risk	Street	Town	Along Melbourne Water Watercourse	Flood Risk Type
159	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
161	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
163	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
165	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
1/2700	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
2925	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
3035	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
3180	South Gippsland Highway	Tooradin	Western Port Bay	Coastal
4	Swan Street	Tooradin	Western Port Bay	Coastal
5	Tooradin Esplanade	Tooradin	Western Port Bay	Coastal
21	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
23	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
25	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
27	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
29	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
31	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
35	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
60	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
65S	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
70	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
90	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
94	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
100	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
110	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
114	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
120	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
130	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
140	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
150	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
2/155	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
160	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
165	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
170	Tooradin Station Road	Tooradin	Western Port Bay	Coastal
5-7	Yallock Street	Tooradin	Western Port Bay	Coastal
15	Yannathan Street	Tooradin	Western Port Bay	Coastal
25	Yannathan Street	Tooradin	Western Port Bay	Coastal

Total
292

Table C6.3 – Properties at risk of flooding around Westernport Bay in the City of Casey

ISOLATION

Tooradin and Warneet are rural towns with three major entry/exit routes: South Gippsland Hwy to the Northwest and East; and Baxter-Tooradin Rd to the West. Access and egress to/from Tooradin and Warneet may be cut to the east along the South Gippsland Highway to Koo Wee Rup during a 1%

AEP event. Some localised short-duration isolation may also occur within the townships due to flash flooding.

ESSENTIAL INFRASTRUCTURE

Warneet Telephone Exchange on Iluka Street, Warneet may be flooded during a 1% AEP flood event.

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 City of Casey is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/9_Casey_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Tooradin, Cannons Creek & Warneet 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 Tooradin, Cannons Creek & Warneet. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

VicRoads Roads flooded in a 1% AEP (100yr ARI) event
• South Gippsland Highway, Tooradin at Rutter Park Reserve

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

Casey City Council Roads flooded in a 1% AEP (100yr ARI) event			
CANNONS CREEK	• Baview Road	• Lyall Street	• Yallock Street
• Adeneys Road	• Dalmore Road	• Lyne Street	• Yannathan Street
• Albatross Court	• Dore Road	• Lynes Road	**WARNEET**
• Craigs Lane	• Foreshore Road	• Matthew Street	• Banks Street
• Glenalya Parade	• Harewood Mains Road	• Mickle Sreet	• Bungadool Street
TOORADIN	• Harewood Street	• Monomeith Street	• Cooinda Street
• Arthur Ayres Road	• Hopetoun Road	• Swan Street	• Culgoa Street
• Bakewell Street	• Inlet Parade	• Tooradin Station Road	• Rutherford Parade

Table C6.5 – Casey City Council Possible Road Closures during a flooding event

FLOOD MITIGATION

No formal Retarding Basins, Pumping Stations or Levees exist around Tooradin or Warneet.

COMMAND, CONTROL & 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 Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

FLOOD IMPACTS & OPERATIONAL CONSIDERATIONS (INTELLIGENCE CARDS)

The table on the following pages provide a breakdown of the possible consequences of flooding around the Westernport Bay at various tide heights at Tooradin. 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:

- Westernport Bay at Tooradin

FLOOD INTELLIGENCE CARD – TOORADIN TIDAL GAUGE, WESTERNPORT BAY

Version 3 – March 2018

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	**Footbridge adjacent to South Gippsland Highway over Evans Inlet, Tooradin**
MELWAY REFERENCE:	**144 A6**
WATERBODY:	**Western Port Bay**
GAUGE NUMBER:	**228399A**
GAUGE ZERO:	**0.00m AHD**
GAUGE TYPE	**Tide Level**

MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
TELEMETRIC/MANUAL	**Telemetric**
HIGHEST RECORDED FLOOD:	**Unknown**

Tide Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.6m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **292 Properties in Total** **Western Port Bay** • 1, 2, 3, 5 & 7 Anebo Street, Warneet • 25 & 35 Arthur Ayres Road, Tooradin • 3, 4, 5, 6, 7, 9, 10, 12, 14, 16, 18, 20, 22, 26, 26A, 27, 28 & 29 Bakewell Street, Tooradin • 13, 15, 16, 17, 18, 19, 21, 23, 25, 27, 29, 31 & 33 Balaka Street, Warneet • 1, 2, 4, 5, 7, 9, 11, 13 & 15 Banks Street, Warneet • 5, 9, 14, 16, 18-20, 22-24, 23, 26, 28-30, 67, 69, 71, 73, 75 & 79-81 Bayview Road, Tooradin • 45 & 55A Billingsley Road, Tooradin • 1 & 3 Bungadool Street, Warneet • 4 Cannons Creek Road, Cannons Creek	VicSES State and Region to provide warnings to the community and other agencies. VicSES will provide warnings using OSOM and SMSER as required based on the predications provided by BoM regarding flood levels and the risk of Flash Flooding. The Central Duty officer in conjunction with the Regional Agency Controller will maintain operational awareness and form an appropriate response arrangement to suit the level of incident

Tide Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 1 & 2 Cooinda Street, Warneet • 18A, 22, 24 & 30 Culgoa Street, Warneet • 2 Cygnet Street, Tooradin • 75 Dalmore Road, Tooradin • 3-5, 7, 8, 10, 18, 19, 21 & 23 Elimatta Street, Warneet • 15, 17, 19, 23, 25, 41A, 54, 56, 57, 58, 59, 60, 61 & 62 Glenalva Parade, Cannons Creek • 13, 20, 21, 22, 23, 24, 25 & 26 Gnoorong Street, Warneet • 11, 13, 15, 17 & 19 Hardy Avenue, Cannons Creek • 40, 80, 90, 110, 190 & 260 Hardys Road, Tooradin • 1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26 & 28 Harewood Street, Tooradin • 115, 130, 140, 170, 175, 195, 200 & 210 Harewood Mains Road, Tooradin • 4 & 6 Iluka Street, Warneet • 40 & 50 Inlet Parade, Tooradin • 19, 25 & 27 Kallara Road, Warneet • 4, 6, 19, 21, 24, 26 & 28 Lyall Street, Tooradin • 2-5I, 7 & 8 Lyne Street, Tooradin • 10, 11, 12, 13, 14, 16 & 18 Matthew Street, Tooradin • 4, 13, 15, 2/17, 4/17, 19, 21, 22, 23, 25, 26, 27, 28 & 1/30-32 Mickle Street, Tooradin • 5, 7, 9, 11, 20, 21, 25, 30, 31, 35 & 40 Monomeith Street, Tooradin • 1, 3 & 5-7 Peters Street, Cannons Creek • 1 Rigby Street, Warneet • 34, 38, 40, 66, 68, 70, 1/72, 74, 76, 78 & 80 Rutherford Parade, Warneet • 62-68, 71, 85, 87, 90, 1/92, 2/92, 94, 96, 98, 100, 101, 102, 103, 104-106, 105-107, Units 103/106, 108, 112, 114, 115-117, 116, 118, 120, 120A, 122, 124, 126, 127, 128, 129-135, 130, 137, 139, 141, 143, 145, 147, 151, 153, 155, 157, 159, 161, 163, 165, 1/2700, 2925, 3035 & 3180 South Gippsland Highway, Tooradin • 4 Swan Street, Tooradin • 5 Tooradin Esplanade, Tooradin • 21, 23, 25, 27, 29, 31, 35, 60, 65S, 70, 90, 94, 100, 110, 114, 120, 130, 140, 150, 2/155, 160, 165 & 170 Tooradin Station Road, Tooradin • 5-7 Yallock Street, Tooradin • 15 & 25 Yannathan Street, Tooradin **Community Infrastructure Flooded** • Tooradin Kindergarten on South Gippsland Hwy, Tooradin • Tooradin Primary School on Bayview Road, Tooradin • Tooradin Recreation Reserve, South Gippsland Highway, Tooradin	VicSES to respond as per request by request basis. Primary school to implement their emergency evacuation plan as required VicSES in conjunction with Telstra to monitor Exchange and provide sandbagging as a priority Council to provide road closure signage if required.

Tide Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Rutter Park Memorial Reserve, South Gippsland Highway, Tooradin **Essential Infrastructure Impacted** • Warneet Telephone Exchange on Iluka Street, Warneet **Water Over Road** • Foreshore Road, Tooradin • Mickle Street, Tooradin • Lyall Street, Tooradin • Bakewell Street, Tooradin • South Gippsland Highway, Tooradin at Rutter Park Reserve • Swan Street, Tooradin • Harewood Street, Tooradin • Monomeith Street, Tooradin • Yallock Street, Tooradin • Yannathan Street, Tooradin • Inlet Parade, Tooradin • Tooradin Station Road, Tooradin • Hopetoun Road, Tooradin • Matthew Street, Tooradin • Bayview Road, Tooradin • Lyne Street, Tooradin • Dalmore Road, Tooradin • Harewood Mains Road, Tooradin • Arthur Ayres Road, Tooradin • Lynes Road, Tooradin • Dore Road, Tooradin • Adeneys Road, Cannons Creek • Glenalva Parade, Cannons Creek • Albatross Court, Cannons Creek • Cooinda Street, Warneet • Rutherford Parade, Warneet • Banks Street, Warneet • Culgoa Street, Warneet • Bungadool Street, Warneet • Craigs Lane, Cannons Creek	

Table C6.6 – Breakdown of likely consequences at various Tooradin gauge level heights around the Westernport Bay with operational considerations

APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

Phase 1 - Decision to Evacuate

The Incident Controller 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 Emergency Response Plan (SERP) 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;
- Different stages of an evacuation process.

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

There are currently no pre-established triggers for evacuation within the City of Casey.

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, MRM, DHHS and other key agencies and expert advice (CMA's and Flood Intelligence specialists).

Phase 3 – Withdrawal

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

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 IC or via the appointed VicPol evacuation manager.

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 Council's Emergency Management Co-ordinator.

Phase 4 – Shelter

Relief/ Recovery Centres and/or assembly areas which cater for people's basic needs may be established to meet the immediate needs of people affected by storm and/or flooding. Relief Centres will be determined dependent on location and size of event.

The emergency Relief/ Recovery centres and/or Assembly Areas are listed in the table below:

Sector	Relief Centre/Assembly Area (include address)	Comments
To be determined dependant on location/ size of event		As per ERC facility plan available through MERO
To be determined dependant on location/ size of event		As per ERC facility plan available through MERO

VicPol in consultation with VICSES will liaise with Local Government and DHHS, where regional coordination is required, via the relevant control centre to plan for the opening and operation of emergency relief centres. This can best be achieved through the Emergency Management Team (EMT).

Animal Shelter

The need for animal shelter compounds will be determined dependant on the location and size of the event. Refer to the MEMPlan for more information.

Caravans and Caravan parks

No caravan evacuation sites have been identified in the City of Casey. Where present, caravans may be 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 Incident Controller 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 storm/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;
- 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/or flood. This may include road closures affecting school bus routes, water treatment plant affecting potable water supplies etc.

Essential Infrastructure and Property Protection

Essential Infrastructure and properties may require protection include residences, businesses, roads, power supply etc.

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

Requests for City of Casy resources to support rescue operations will forwarded to the MECC if established or EMLO if an ICC has been established.

Resources are available within the Narre Warren SES unit to assist with rescue operations. Full details of equipment and resources are held by the SES unit. Known high-risk areas/communities (i.e. low-lying islands) where rescues might be required are detailed in the **Appendix F** flood maps.

APPENDIX E - FLOOD WARNING SYSTEMS

Storm and Flood Warning

Storm and Flood Warning products and Flood Class Levels can be found on the BoM website and through the VicEmergency 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.

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;
- 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

There are no local Flood Warning Arrangements within the City of Casey

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

Overview

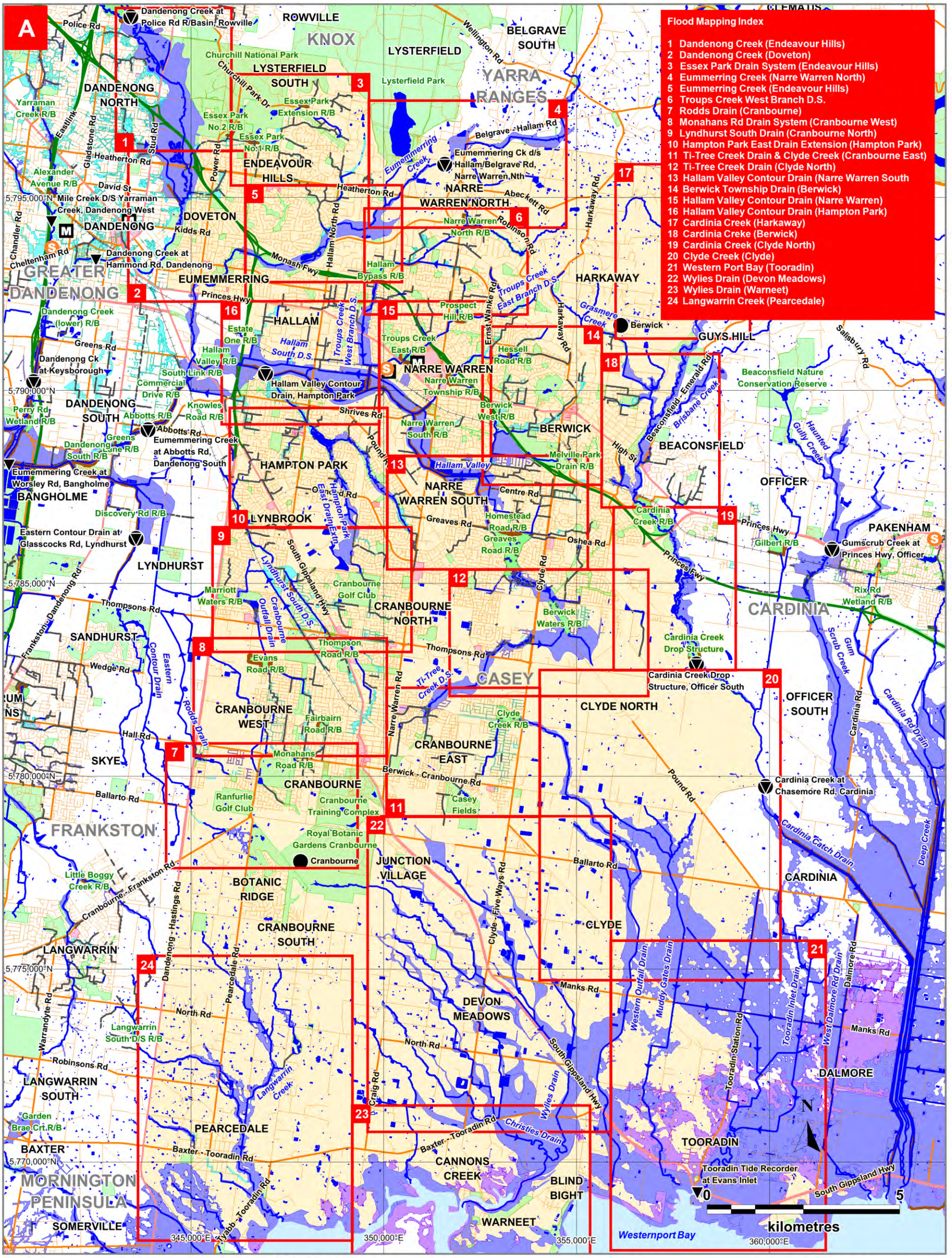
Maps considered useful to flood response are included in this Appendix. They include:

- A map outlining a series of flooding hot spot maps within the City of Casey.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within the City of Casey and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 24 maps showing flooding hot spots within the City of Casey together with the 1% AEP (100-year ARI) flood extents (sourced from the Melbourne Water GIS).

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 Casey 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 website http://planningschemes.dpcd.vic.gov.au/.
- Maps showing 1 in 100-year ARI (1% AEP) flood extents and floodways (together with volume, height and water quality data) are shown at the Victorian Water Resources website http://mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&locale=en-AU

City of Casey Municipal Maps (sourced Melbourne Water GIS)



B

Flood Study Details

(a). Berwick South D.S. (WBM, October 2000)
(b). Berwick West & Township D.S. (Berwick West D.S. & Township D.S., WaterTech, April 2013)
(c). Cardinia Creek (Melbourne Water, December 1989)
(d). Clyde Creek (Collison Rd Drainage Scheme, Melbourne Water, May 2011)
(e). Cranbourne Central D.S. (Cranbourne CDS, AECOM, July 2011)
(f). Dandenong Creek (Melbourne Water, December 2001)
(g). Essex Park D.S.(WBM, October 2000)
(h). Eumemmerring Creek (WBM, October 2000)
(i). Grasmere Creek (Melbourne Water, February 2009)
(j). Hallam North Rd D.S. (Hallam Road North, WBM, October 2000)
(k). Hallam Valley (Hallam Valley Catchment, Melbourne Water, March 2001)
(l). Hampton Park East D.S. (Melbourne Water, January 2013)
(m). Hampton Park East Drain Extn (Hampton Park Extension, WBM, October 2000)
(n). Hampton Park West D.S. (CMPS&F Pty Ltd, April 1998)
(o). Heatherton - Power Rd D.S. (CMPS&F Pty Ltd, April 1998)
(p). Langwarrin Creek (Melbourne Water, June 2014)
(q). Langwarrin Creek East Branch (Mornington Peninsula/Western Port, August 2013)
(r). Lyndhurst South D.S. (WBM, October 2000)
(s). Monohans Rd D.S. (Casey Drainage Survey 1996/7, CMPS&F Pty Ltd, February 1998)
(t). Narre Warren Township D.S. (WBM, October 2000)
(u). O'Shea's Rd D.S. (WBM, October 2000)
(v). Pearcedale South (Watsons Creek Flood Modelling, Melbourne Water, August 2014)
(w). Ti-Tree Creek D.S. (Melbourne Water, January 2009)
(x). Tooradin Rd Drain (Koo Wee Rup Flood Study, Cardno, November 2014)
(y). Troups Creek West Branch D.S. (Melbourne Water, February 2015)
(z). Troups Creek East Branch D.S. (WBM, October 2000)

CITY OF CASEY

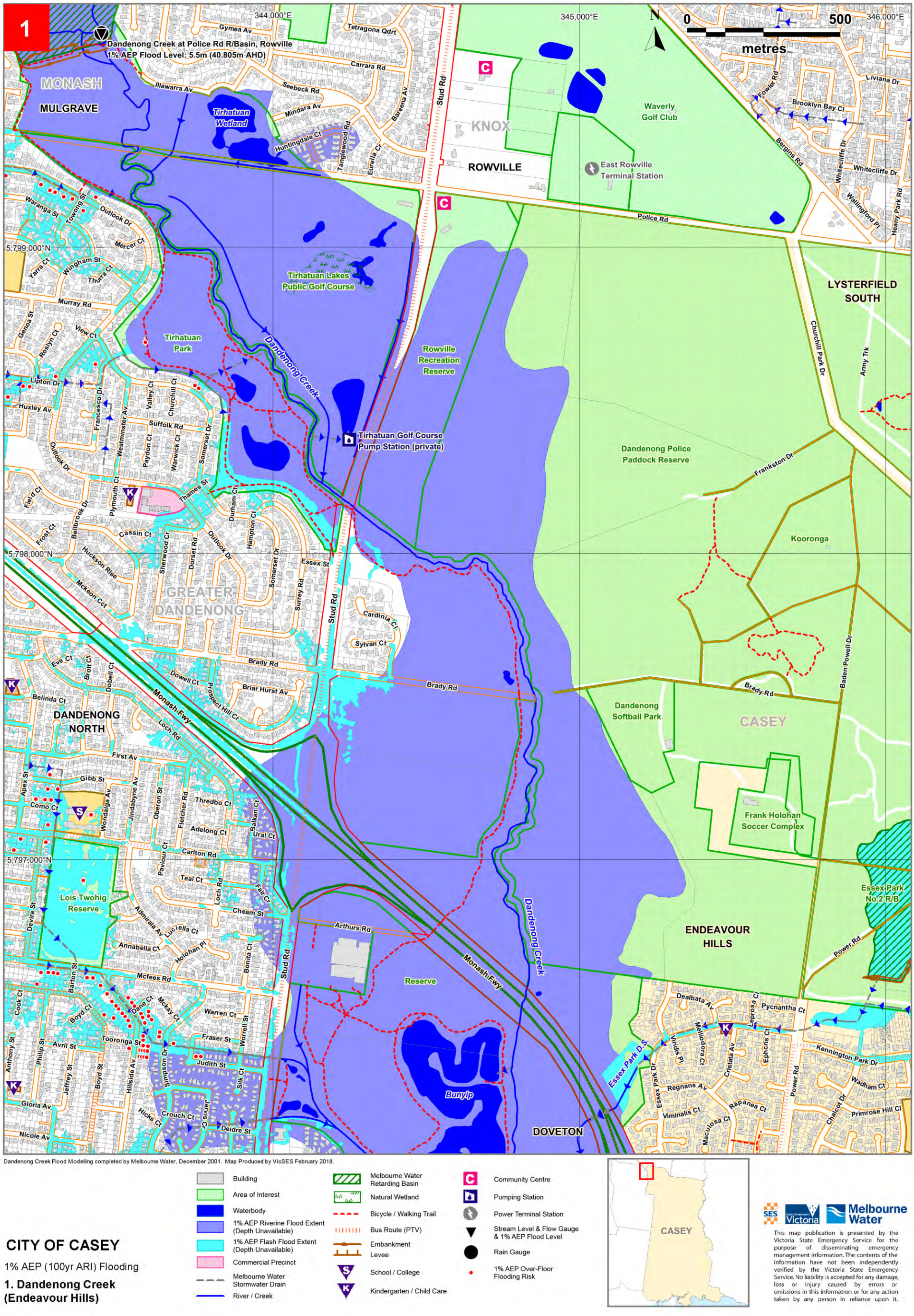
Version 3: February 2018

B - 1% AEP (100yr ARI) Flood Extent

1% AEP Riverine Flood Extent
1% AEP Flash Flood Extent
Reserve / Area of Interest
Waterbody / Reservoir
Melbourne Water Retarding Basin
Commercial Precinct
River Level Gauge
Rain Gauge
Municipal Building
Municipal Depot
SES LHQ
River / Creek
Melbourne Water Stormwater Drain
Levee / Embankment
Tramway
1% AEP Storm Surge Flood Extent

SES
State Government Victoria
Melbourne Water

Flood Extent Maps (sourced Melbourne Water GIS)



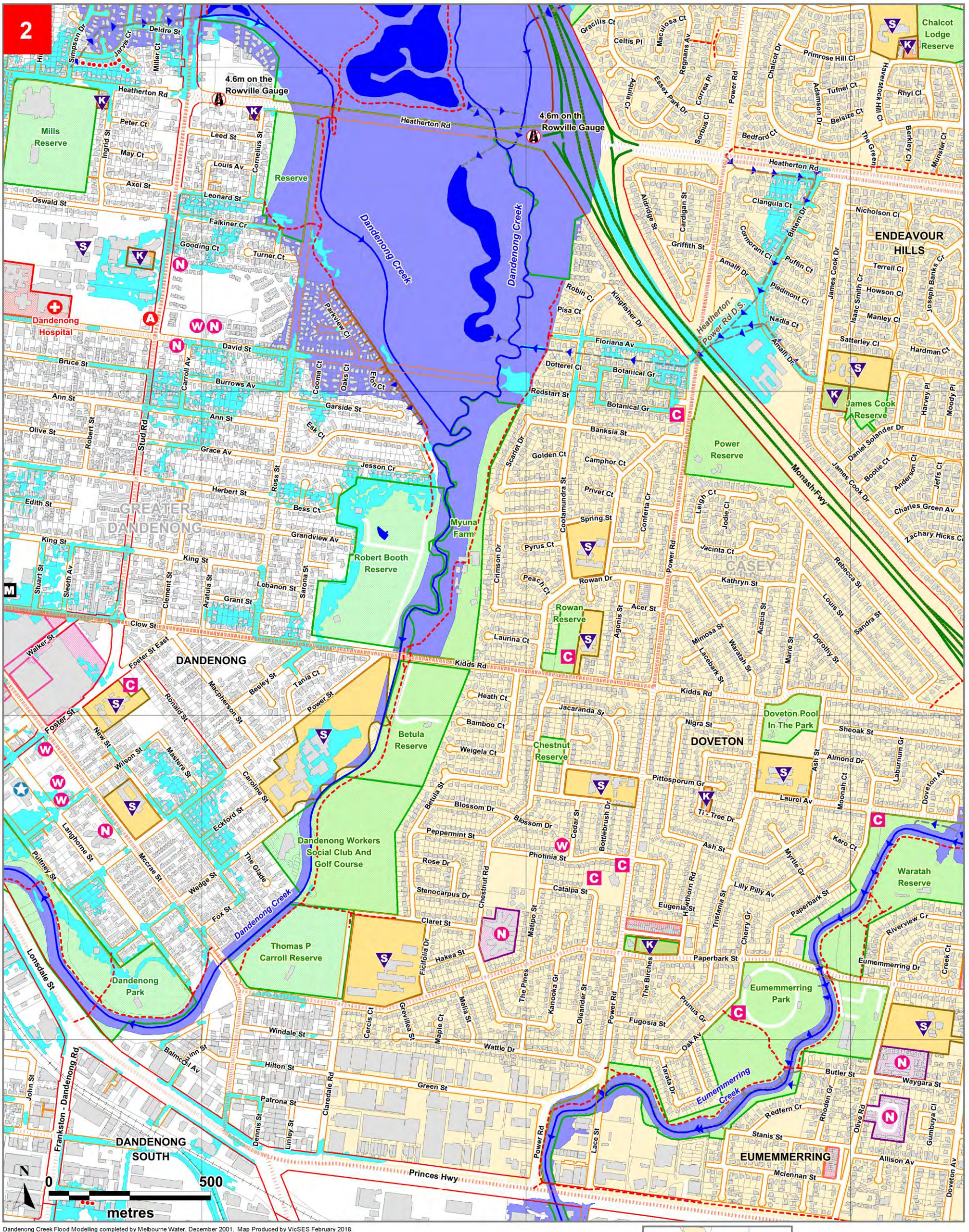
Dandenong Creek Flood Modelling completed by Melbourne Water, December 2001. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

1. Dandenong Creek (Endeavour Hills)

- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Stormwater Drain
- River / Creek
- Melbourne Water Retarding Basin
- Natural Wetland
- Bicycle / Walking Trail
- Bus Route (PTV)
- Embankment
- Levee
- School / College
- Kindergarten / Child Care
- Community Centre
- Pumping Station
- Power Terminal Station
- Stream Level & Flow Gauge & 1% AEP Flood Level
- Rain Gauge
- 1% AEP Over-Floor Flooding Risk



Dandenong Creek Flood Modelling completed by Melbourne Water, December 2001. Map Produced by VicSES February 2018.

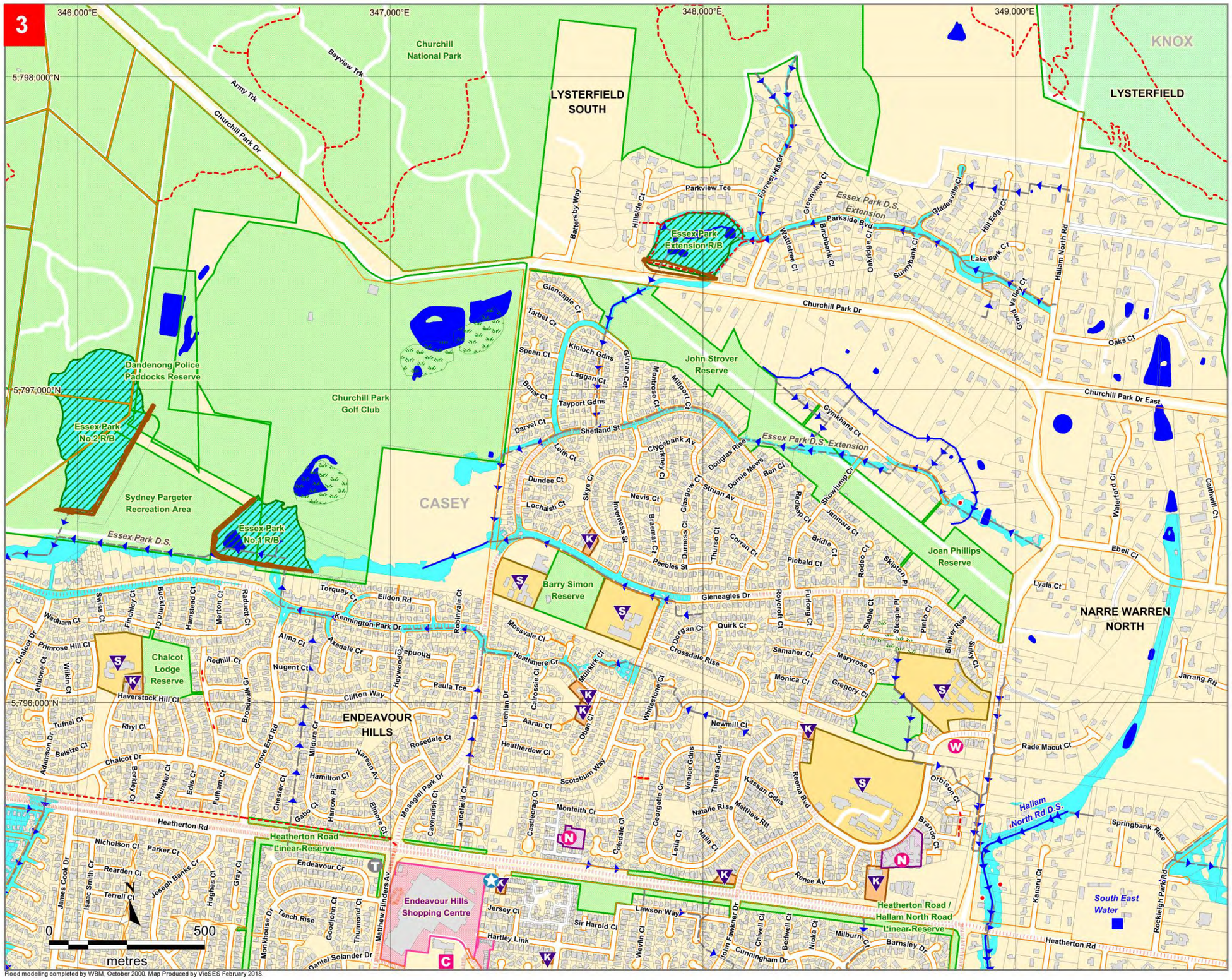
CITY OF CASEY

1% AEP (100yr ARI) Flooding

2. Dandenong Creek (Doveton)

- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Embankment
- Levee
- School / College
- Kindergarten / Child Care
- Ambulance Station
- Hospital
- Community Centre
- Road Closure Risk with height against Gauge
- Nursing Home / Aged Care
- Place Of Worship
- Municipal Offices
- 1% AEP Over-Floor Flooding Risk
- Police Station

SES Victoria Melbourne Water



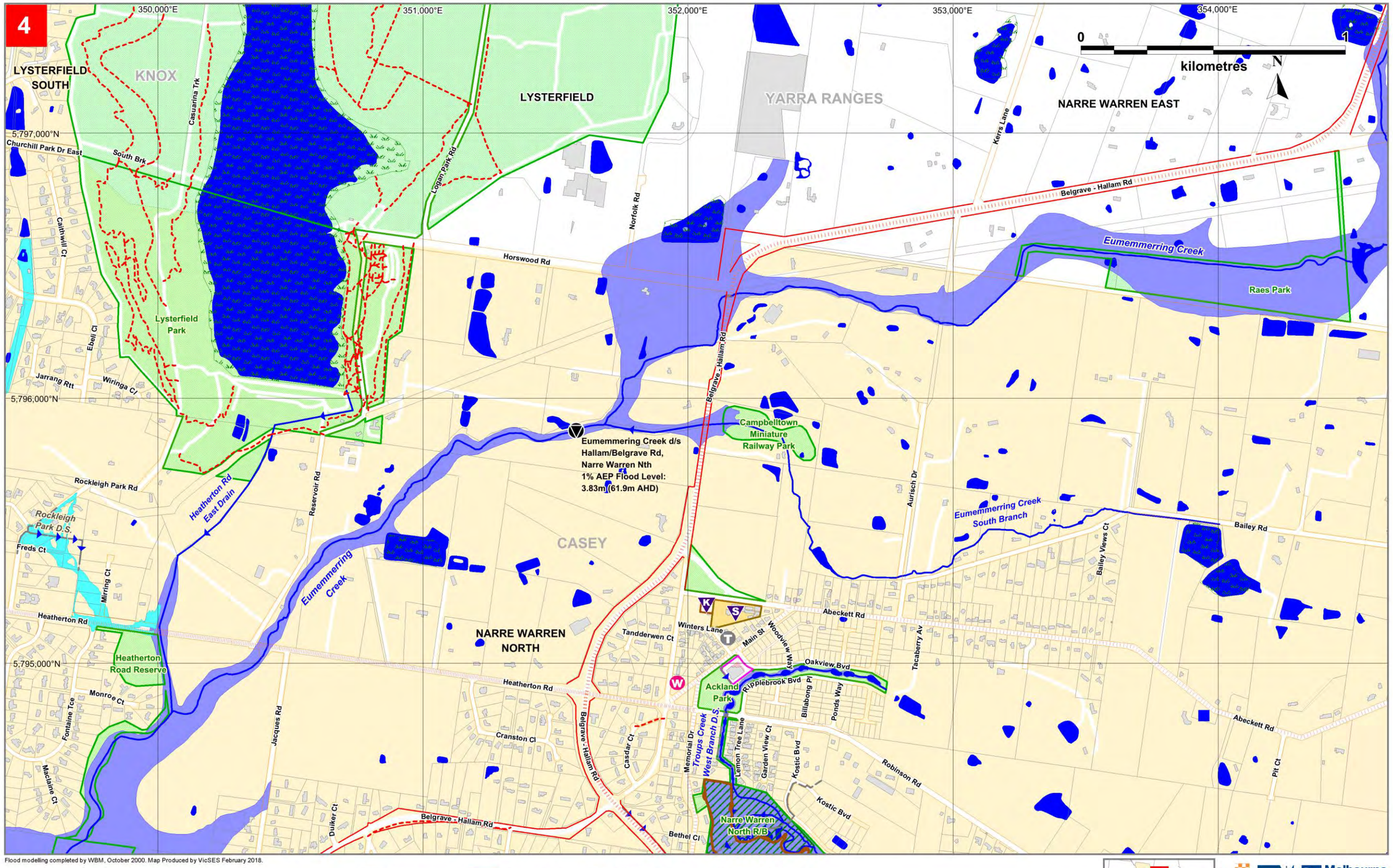
Flood modelling completed by WBM, October 2000. Map Produced by VicSES February 2018.

- Building
- Area of Interest
- Waterbody
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Shopping Centre
- Melbourne Water Retarding Basin
- Natural Wetland
- Embankment
- Melbourne Water Stormwater Drain
- Creek / Waterway
- Bicycle / Walking Trail
- Bus Routes (PTV)
- School / College
- Kindergarten / Child Care
- Place Of Worship
- Nursing Home / Aged Care
- Community Centre
- 1% AEP Over-Floor Flooding Risk
- Police Station
- Telephone Exchange

CITY OF CASEY

1% AEP (100yr ARI) Flooding

3. Essex Park Drain System (Endeavour Hills)



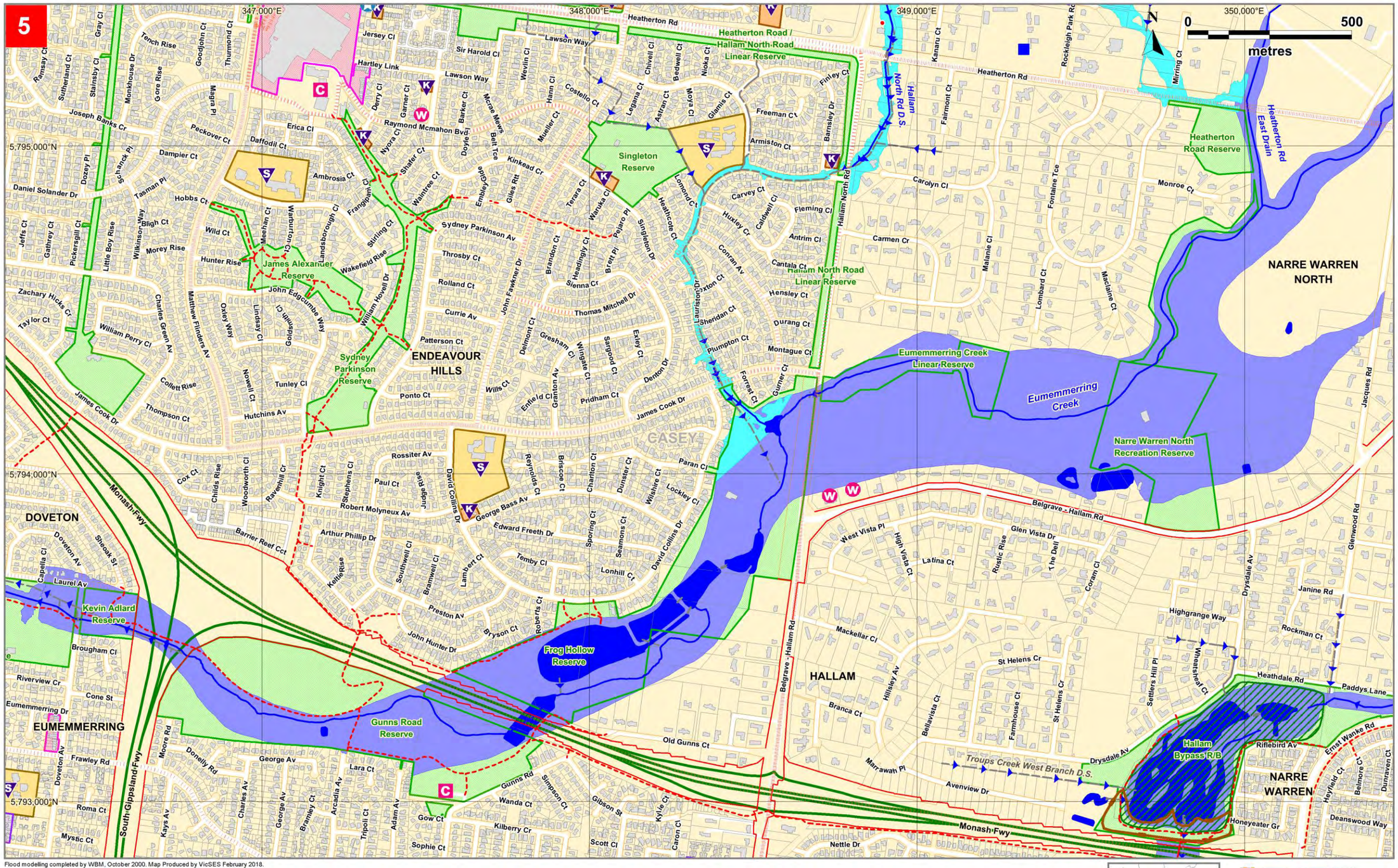
Flood modelling completed by WBM, October 2000. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

4. Eummerring Creek (Narre Warren North)

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Retarding Basin
- Natural Wetland
- Creek / Channel
- Melbourne Water Stormwater Drain
- Bus Route (PTV)
- Embankment
- Bicycle / Walking Trail
- Telephone Exchange
- Place Of Worship
- School / College
- Kindergarten / Childcare
- Stream Level Gague & 1% AEP Flood Level
- Rain Gauge



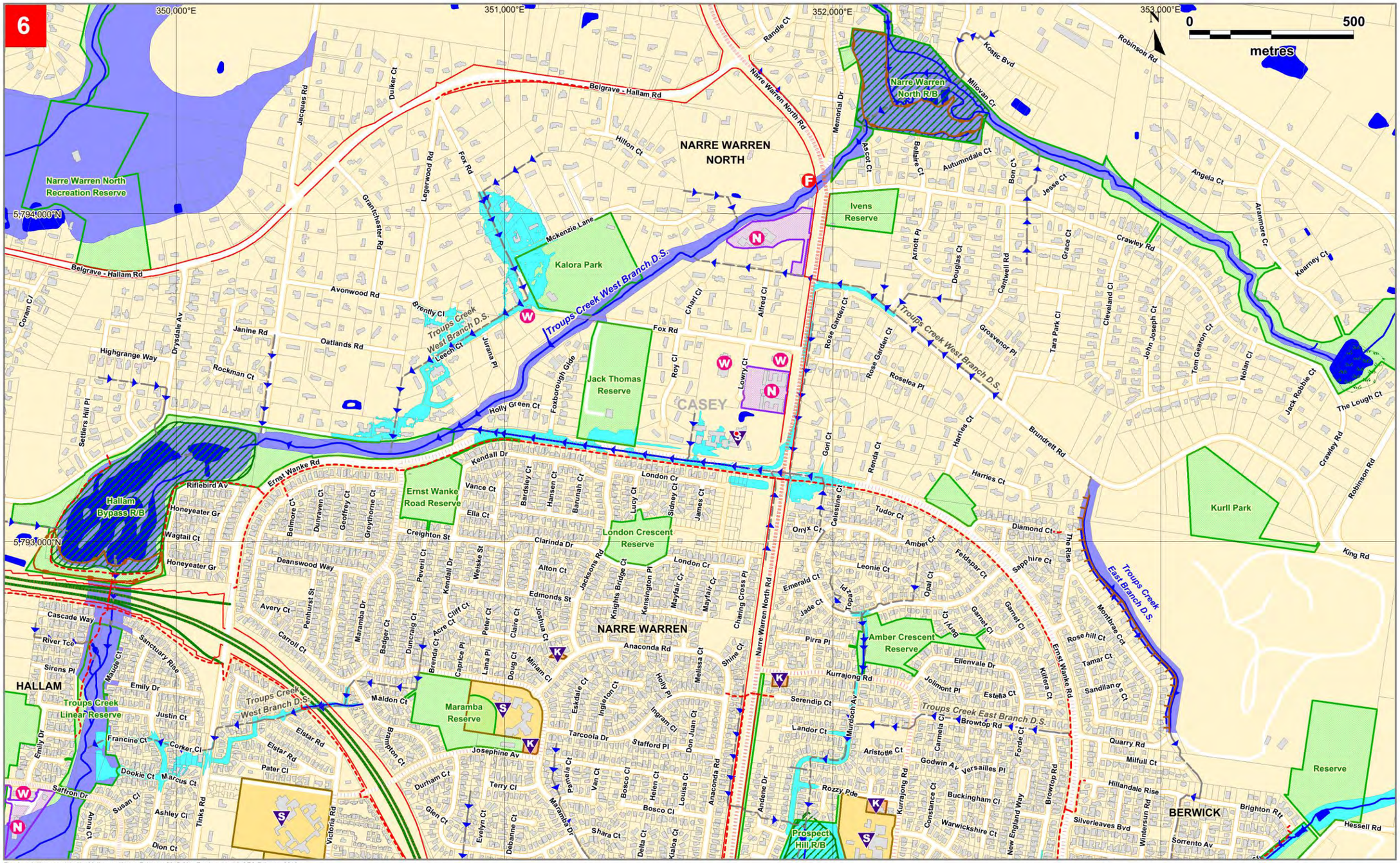
Flood modelling completed by WBM, October 2000. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

5. Eummerring Creek (Endeavour Hills)

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Creek / Channel
- Melbourne Water Stormwater Drain
- Bus Route (PTV)
- Embankment
- Place Of Worship
- School / College
- Kindergarten / Childcare



Flood modelling completed by Melbourne Water, February 2015. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

6. Troups Creek West Branch D.S. (Narre Warren)

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Creek / Channel
- Melbourne Water Stormwater Drain
- Bus Route (PTV)
- Embankment
- Levee
- Place Of Worship
- School / College
- Kindergarten / Childcare

7

345,000°E 346,000°E 347,000°E 348,000°E 349,000°E

5,780,000°N

5,779,000°N

5,778,000°N

FRANKSTON

CRANBOURNE WEST

SKYE

CASEY

CRANBOURNE

CRANBOURNE SOUTH

BOTANIC RIDGE

LANGWARRIN

Cranbourne

Hall Rd

Asteria Cr

Eos Cr

Aphrodite Way

Gaia St

Olympus Cr

Atlas Dr

Zeus Av

Minerva Av

Hermes Av

Pandora Dr

Dandenong - Hastings Rd

Rodds Drain

City Vista Cct

Alarah Blvd

Ercildoune Ct

Alice Mary Rd

Red Poll Rd

George Frederick Rd

Elysian Pl

John Russell Rd

Mayflower Dr

Guinea Flower Dr

Hayton Park Blvd

Crowe Av

Ranfurlie Blvd

Crepe Av

Emu Bush Dr

Bugle Lane

Dusky Bells Dr

Rock Daisy Dr

Crepe Av

Bayley Pl

Fortuna Cr

Pegasus Rd

Bacchus Rd

Jupiter Cr

Fortuna Cr

Lemon Gr

Merritt Av

Black Gum Cr

Stocks Dr

Ranfurlie Golf Club

Cranbourne - Frankston Rd

Amstel Golf Club

Amstel Mews

Sunningdale Cr

Lochgreen View

Prestwick Grn

Scarborough Av

Borrowdale Ct

Fishburn Pl

Monahans Rd D.S.

Monahans Road R/B

Huntingdale Ct

Elk Turn

Cherryhills Dr

Sottile Dr

Hilda Way

Coronet Ct

Grandeur Ct

Reserve

Powerscout Rtt

St Mellion Ct

Kingsbarn Ct

Cyril Beechey Lane

Cemetery Rd

Cranbourne Cemetery

Susan Ct

Anne Ct

Valerie Dr

Valepark Cr

Fairbairn Rd

Taylor St

Jillian St

Lurline St

Harry St

Loma St

Binding Av

Cranbourne Dr

Campbell Pde

Bruce St

Sladen St

Scott St

Olodles Rd

Frances Ct

Ketnor St

Baystone Dr

Rimfire Cr

Cranbourne Training Complex

Harpenden Tce

Eaglescliffe Cr

Brookland Greens Blvd

Birkdale Av

The Beffry

Saunton Dr

Sunningdale Cr

Belvair Ct

Cherryhills Dr

Broadstone Way

Dunferline Cr

Rossiare Pl

Shandon Ct

Stonehaven Av

Durnoch Pl

Silverstone Dr

Baildon Ct

Longhirst Av

Ferndown Dr

Lahinch Gr

Ballarto Rd

Cranbourne South

Cranbourne - Frankston Rd

Chevron Av

Stannill Dr

Woodlands Rd

Pearcedale Rd

Setters Run

Espie Ct

Maraline Rd

Ballarto Rd

0 1 kilometres

N

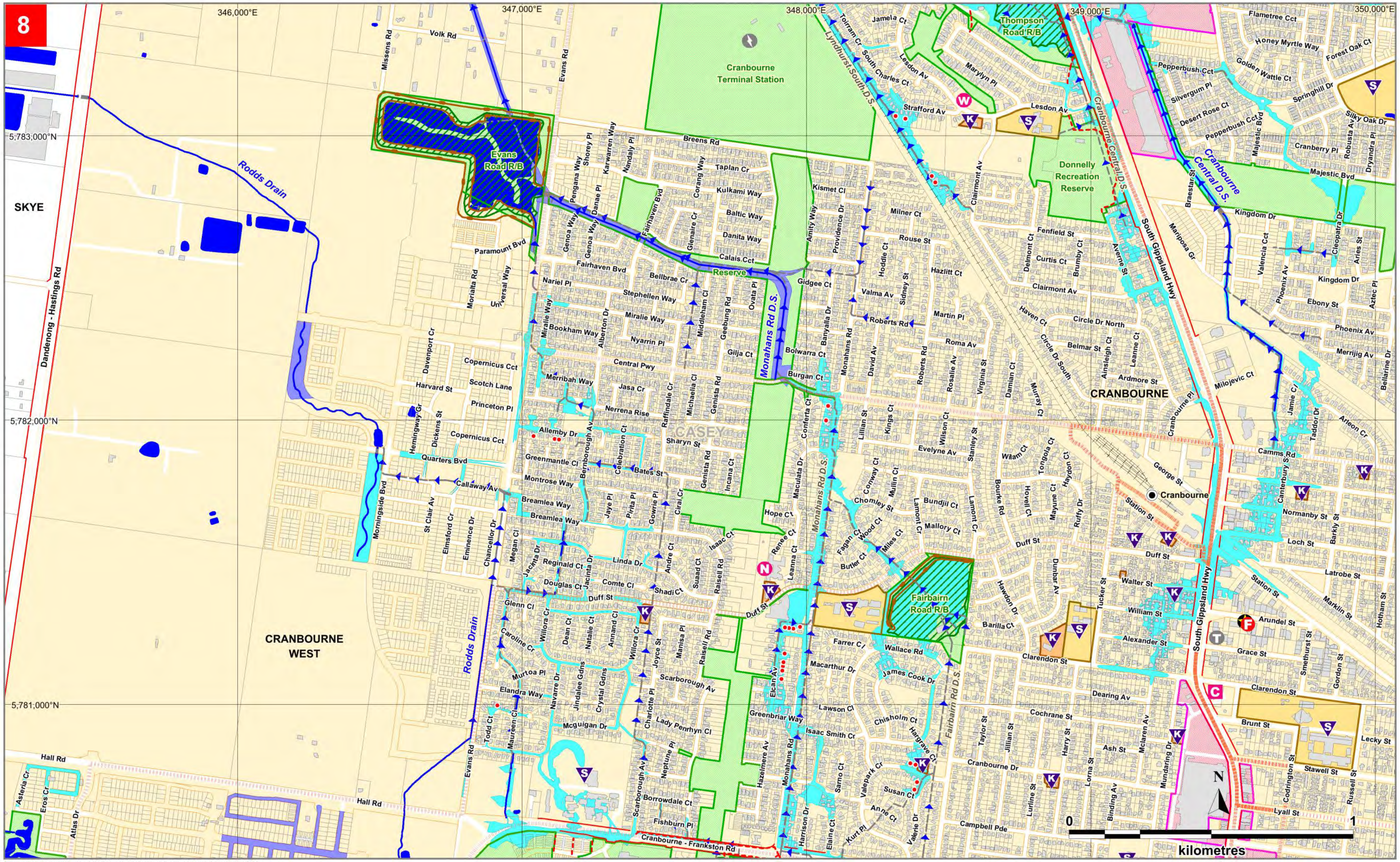
Flood modelling completed by AECOM, July 2011. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

7. Rodds Drain (Cranbourne)

Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
1% Annual Chance Flash Flood Extent (Depth Unavailable)
Commercial Precinct
Melbourne Water Retarding Basin
Natural Wetland
Creek / Channel
Melbourne Water Stormwater Drain
Bus Route (PTV)
Bicycle / Walking Trail
School / College
Kindergarten / Childcare
Ambulance Station
Hospital
Rain Gauge

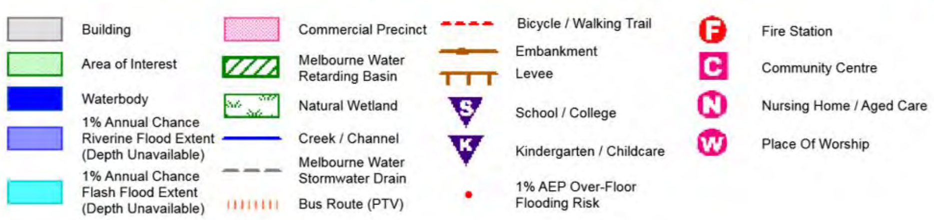


Flood modelling completed by AECOM, July 2011. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

8. Monohans Rd Drain System (Cranbourne West)



9

346,000°E 347,000°E 348,000°E 349,000°E 350,000°E

5,786,000°N 5,785,000°N 5,784,000°N

LYNBROOK HAMPTON PARK LYNDHURST CASEY CRANBOURNE NORTH CRANBOURNE WEST NARRE WARREN SOUTH CRANBOURNE

South Gippsland Hwy Lyndhurst South D.S. Cranbourne Outfall Drain Evans Rd Glasscocks Rd Thompsons Rd Merinda Park Blvd Marriott Blvd Dandenong - Hastings Rd

Ormond Road Reserve Lawless Drive Reserve Rachel Drive Reserve Waverley Park Drive Reserve Gipps Crescent Reserve Cranbourne Golf Club Marriott Waters Reserve Merinda Park Station Reserve Courtenay Avenue Reserve Elizabeth Street Reserve Conway Street Reserve Merinda Park Thompson Road R/B Cranbourne Terminal Station

Marriott Waters R/B

0 1 kilometres

Flood modelling completed by AECOM, July 2011. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

9. Lyndhurst South Drain (Cranbourne North)

Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
1% Annual Chance Flash Flood Extent (Depth Unavailable)

1% AEP Flash Flood Depth
Greater than 60cm
Between 30cm and 60cm
Up to 30cm
Commercial Precinct
Melbourne Water Retarding Basin

Natural Wetland
Creek / Channel
Melbourne Water Stormwater Drain
Bus Route (PTV)
Bicycle / Walking Trail

School / College
Kindergarten / Childcare
Ambulance Station
Nursing Home / Aged Care
Place Of Worship

1% AEP Over-Floor Flooding Risk
Power Terminal Station
Pumping Station
Telephone Exchange

CASEY

SES Victoria Melbourne Water

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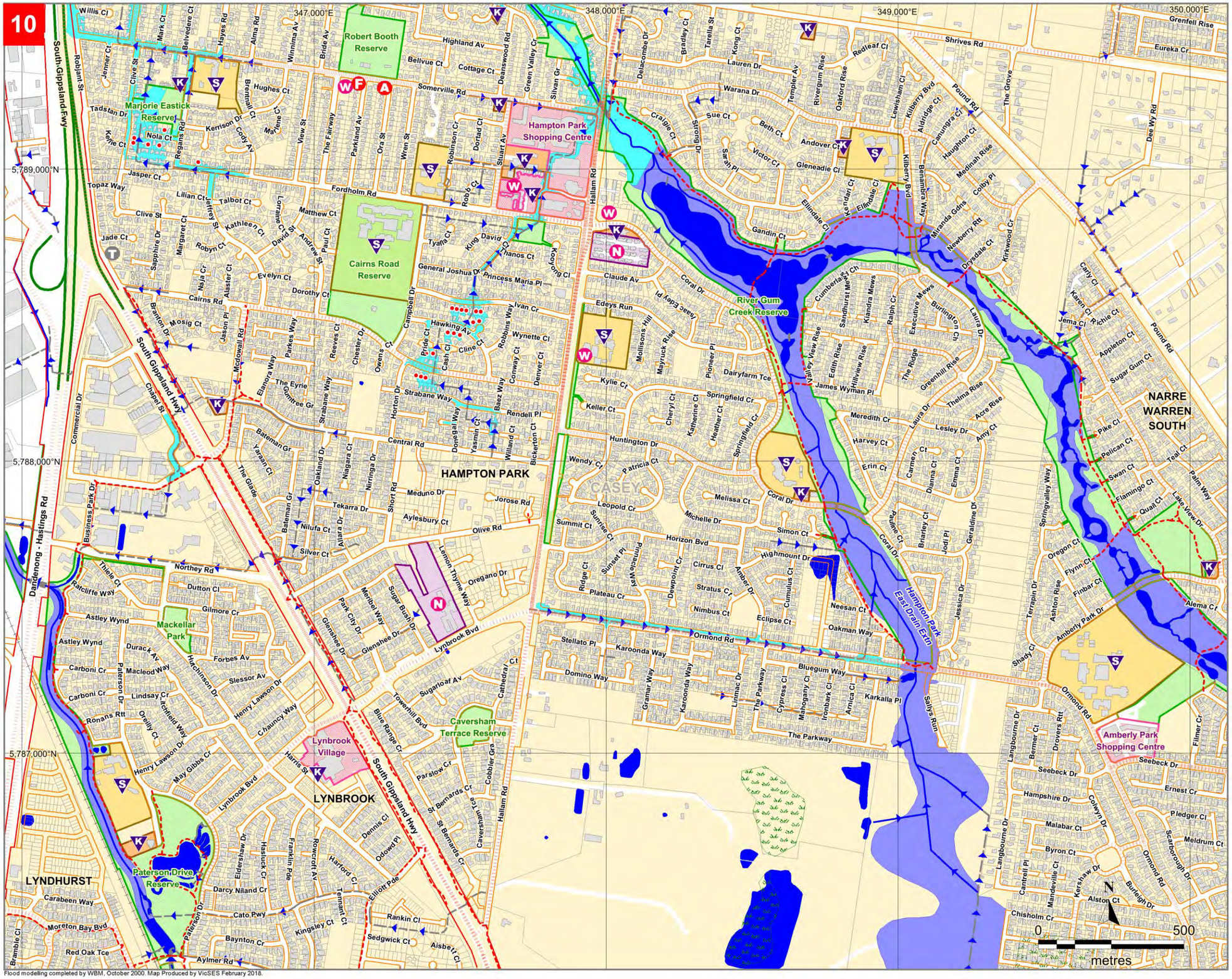


CITY OF CASEY

1% AEP (100yr ARI) Flooding

10. Hampton Park East Drain Extension (Hampton Park)

N

0 500 metres

11

351,000°E 352,000°E 353,000°E 354,000°E

5,782,000°N 5,781,000°N 5,780,000°N

Reserve Reserve Reserve Reserve Clyde Creek R/B Clyde Recreation Reserve

Ti-tree Creek D.S. Cranbourne East D.S. Clyde Creek Clyde Creek Clyde Creek

CASEY CRANBOURNE EAST CLYDE NORTH CLYDE

Chisholm Institute of TAFE

Casey Fields

Linsell Blvd Berwick - Cranbourne Rd New Holland Dr Pattersons Rd

Dartmoor Dr Kirwan Dr Dunlavin Way Tangemere Way Donohue St Brocker St Glenelg St Naas Rd Bremer St Frankland St Campaspe St Thunderbolt Dr Ben Hall St Westwood Rd Yammerbook Way Wild Scotchman Way Peisley Cr Wesson Way Howe Way Fenix Way Marwedel Av Vantage Av Rhinelander Cl Karabair St Jutland Cl Camargue Cct Calabrese Cct Blackledge Dr Kilmarnock Way Dream Av Haflinger Av Blackforest Way Palomino Av Hackney Cct Heather Gr Holsteiner Tce Percheron Way Hanoverian St Ventasso St Paso Gr Gelderland Dr Appaloosa Gr Tawleed Gr Fleuve Rise Morphetville St Tristram Rise Scenic Av Green Gully Rd Trickett St Ossa Cr Hill Farm Dr Cradle Av Bimbery Cct Cadillac St Corvette Av Fairlane Ct San Fratello St Challenger Cct Beagle St Northumbria St Ardent Cr Bradford Dr Statesman Cct Scotsdale Dr Limerick Rd Bowyer Av Monmouth Rd Vixen Ct Waterloo Rd Tanner Av Carnavon St Aquitaine Dr Wiltshire Av Barter Cr Headland Way Corrigans Rd Thurvaston Cr Dash Dr Coven Hth Weatherdon Way Willowbank Pl Foxwood Dr Horsham Dr Latrobe St Loch St Normanby St Bowen St Rochester Pde Linsell Blvd Trafalgar Way Chatham Cl Cornwell Cr Brindalee Pl Bellarine Dr Thistlewood Pl Oak Post Pl Woodchase Ct Emmer Green Rtt Briarcrest Dr Butterfield Pl Native Rtt Beatham Way Lineham Dr Canopy Gr Berwick - Cranbourne Rd Shelburn Way Bathgate Cr Bankton Av Rosyth Way Sinatra Way Gwenton Av Pettigrew St Cloverbank Dr Eilburn Dr Cannore St Rannoch St Artfield St Dunstan St Haines St Prendergast Av Elmslie Dr Holt Lane Macpherson Cct Heales Rd Scullin St Cortula Rd Mcewan Dr Casey Fields Blvd Pyrenees Rd Illawarra Av Kosciuszko Cct Selandra Blvd Lusitano Way Falabella Rd Lipizzan Way Walter Cct Connewara Cr Macmillop Way Firebird St Ferrari Dr Collison Rd Mayfield Rd Birdwell Dr Tattle Gr Ardeni Cr Archers Field Dr Tyndall St Maddock Dr Greenaway Tce Reynard Pl Avalon Cr Arrow Rd Hewitt St Waterloo Rd Stately Dr Sancho Dr Fable Way Chief Ct Cromwell Lane Hunt Club Blvd Cardiff Gr Houndsforth St Waterside Dr Arnold St Narre Warren Rd Greenock Cr Scotsdale Dr Masterton Pl Gatehouse Pde Fetlock Lane Stone Hill Crt Thenford Cl Barnby Gr Yateley Hth Weatherdon Way Ned St Vane St Blaisterinoger Byde Flash Dan Dr Dan Morgan Dr Midnight Rise Starlight Rise Goulburn St Rocky St Dalton Way Esk St Barwon St Mitta Mitta St Duce St Mccallum Dr Harmony Ch Berwick - Cranbourne Rd Clyde Creek Linsell Blvd Garden St Stately Dr Thurvaston Cr Willowbank Pl Connor Mews Kells Cl Fernisky Dr Armoy Cl Fiand Pl Cl Janetta Cl Ballynenna Cr Dartmoor Dr Thames Ct Brocker St Frankland St Campaspe St Linsell Blvd Clyde Creek Berwick - Cranbourne Rd Linsell Blvd Clyde Creek Linsell Blvd Clyde Creek

Ti-Tree Creek Flood modelling completed by Melbourne Water, January 2009. Clyde Creek Flood modelling completed by Melbourne Water, May 2011. Map Produced by VicSES March 2018.

Building
Area of Interest
Waterbody
1% Annual Chance Flash Flood Extent (Depth Unavailable)
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
Shopping Centre
Melbourne Water Retarding Basin
Melbourne Water Stormwater Drain
Creek / Waterway
Bicycle / Walking Trail
Bus Routes (PTV)
Community Centre
School / College
Kindergarten / Child Care
Nursing Home / Aged Care

CITY OF CASEY

1% AEP (100yr ARI) Flooding

11. Ti-Tree Creek Drain & Clyde Creek (Cranbourne East)

N

0 500

metres

12

NARRE WARREN SOUTH

CRANBOURNE NORTH

CRANBOURNE EAST

CASEY

BERWICK

CLYDE NORTH

Gera Estate Ti-Tree Creek Wetlands

Clyde Road Reserve

Berwick Waters R/B

Arboulea East Wetland

Ti-tree Creek D.S.

Three Creek D.S.

Berwick - Cranbourne Rd

Pound Rd

Glasscocks Rd

Thompsons Rd

Soldiers Rd

Grices Rd

Flood modelling completed by Melbourne Water, January 2009. Map Produced by VicSES February 2018.

CITY OF CASEY

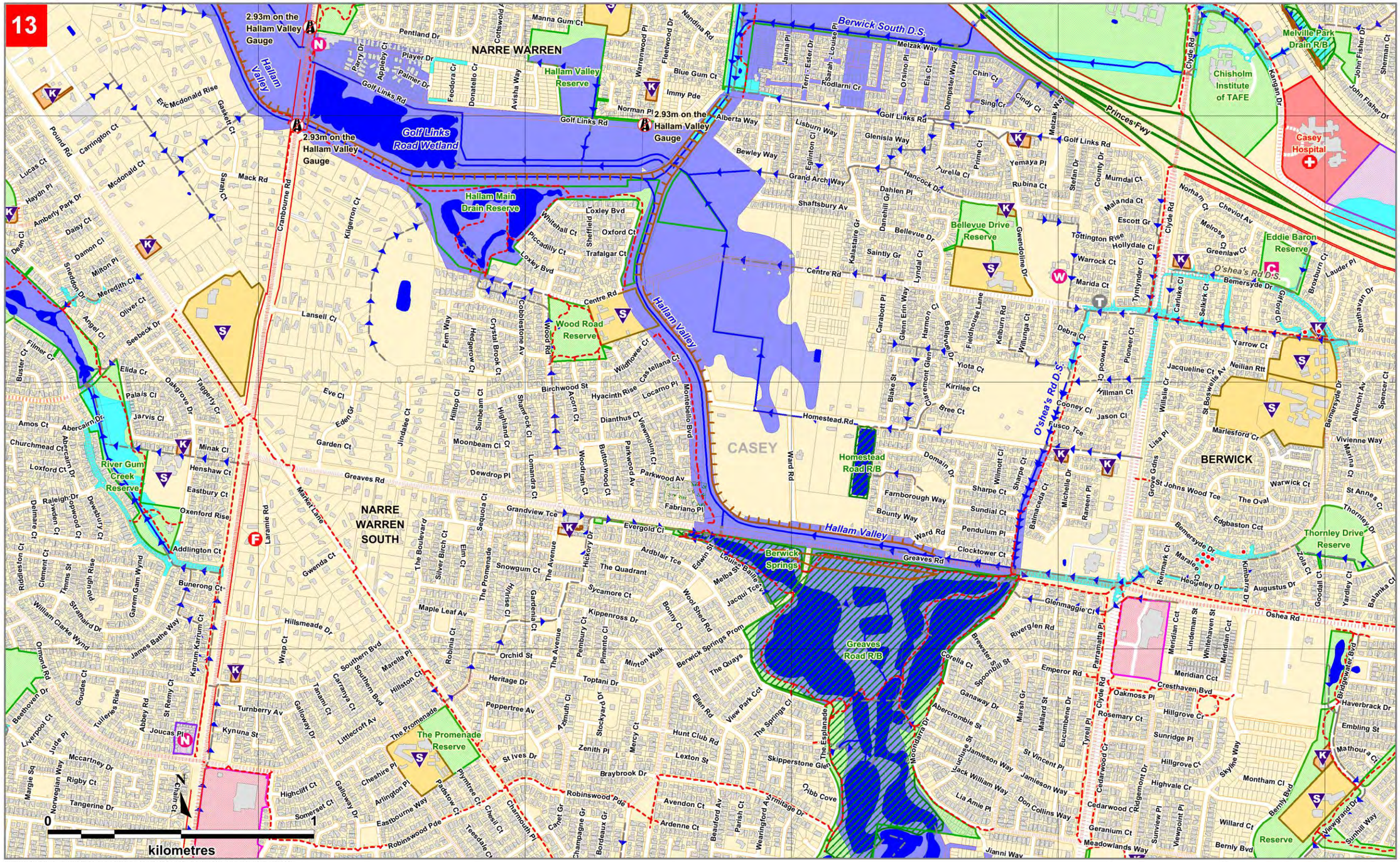
1% AEP (100yr ARI) Flooding

12. Ti-Tree Creek Drain (Clyde North)

Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
1% Annual Chance Flash Flood Extent (Depth Unavailable)
Commercial Precinct
Melbourne Water Retarding Basin
Natural Wetland
Creek / Channel
Melbourne Water Stormwater Drain
Bus Route (PTV)
Bicycle / Walking Trail
School / College
Kindergarten / Childcare

N

0 1 kilometres



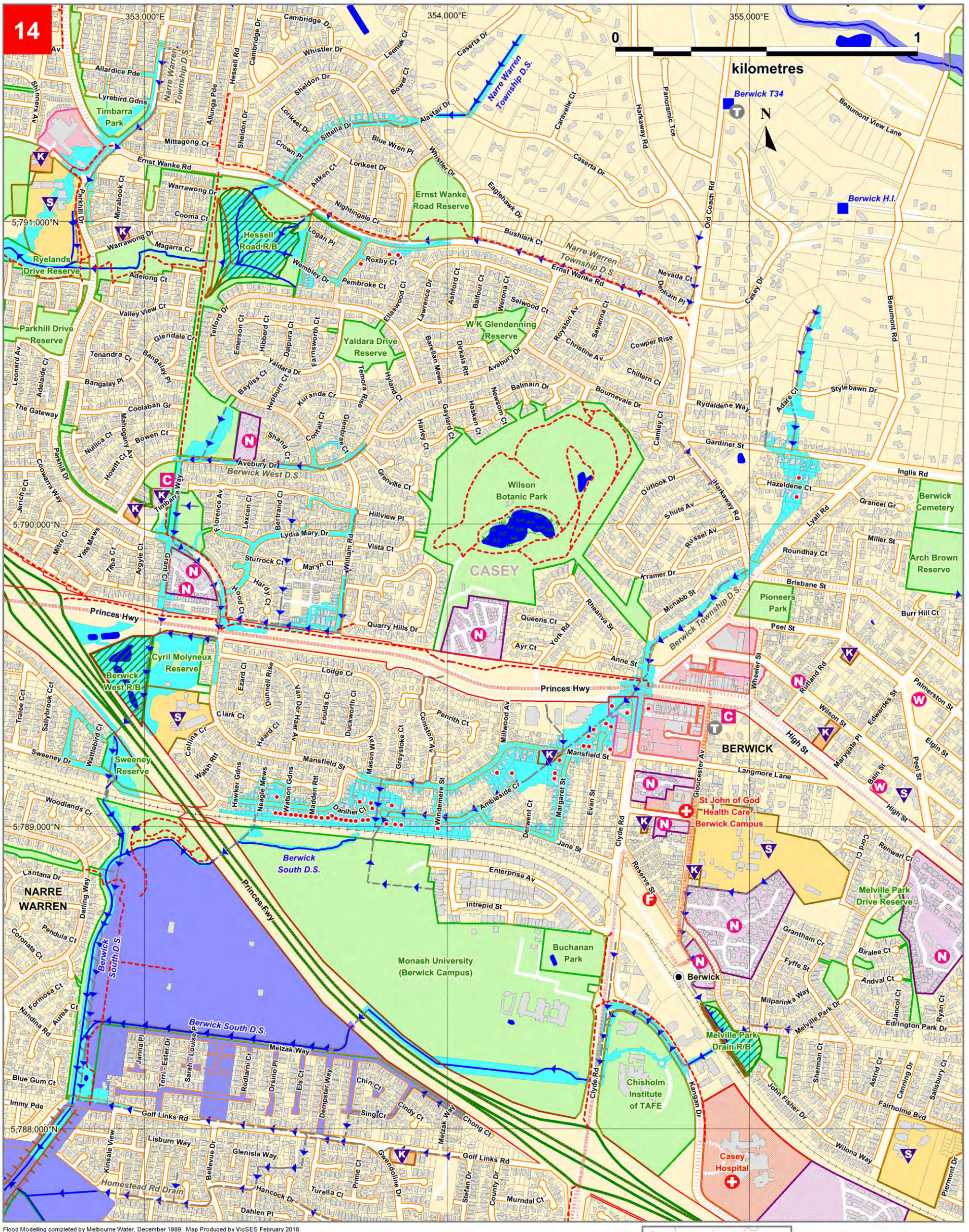
Flood modelling completed by Melbourne Water, March 2001. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

13. Hallam Valley Contour Drain (Narre Warren South)

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Retarding Basin
- Natural Wetland
- Creek / Channel
- Melbourne Water Stormwater Drain
- Bus Route (PTV)
- Embankment
- Levee
- Bicycle / Walking Trail
- Community Centre
- School / College
- Kindergarten / Childcare
- Place Of Worship
- Road Closure Against Gauge
- Fire Station
- Hospital
- 1% AEP Over-Floor Flooding Risk


14
353,000°E
354,000°E
355,000°E
0
1
kilometres
N
5,791,000°N
5,790,000°N
5,789,000°N
5,788,000°N
Berwick T34
Berwick H.I.
Narre Warren Township D.S.
Timbarra Park
Ernst Wanke Road Reserve
Hessell Road R/B
Ryelands Drive Reserve
Parkhill Drive Reserve
Yaldara Drive Reserve
W K Glendenning Reserve
Wilson Botanic Park
CASEY
Berwick West D.S.
Berwick West R/B
Cyril Molyneux Reserve
Princes Hwy
Princes Fwy
Sweeney Reserve
Berwick South D.S.
Berwick South D.S.
Monash University (Berwick Campus)
Buchanan Park
Berwick
BERWICK
NARRE WARREN
Chisholm Institute of TAFE
Melville Park Drain R/B
Melville Park Drive Reserve
Pioneers Park
Arch Brown Reserve
Berwick Cemetery
St John of God Health Care Berwick Campus
Casey Hospital
Homestead Rd Drain
Berwick Township D.S.
Beaumont View Lane
Beaumont Rd
Old Coach Rd
Harkaway Rd
Caserta Dr
Whistler Dr
Eaglehawk Dr
Bushlark Ct
Ernst Wanke Rd
Nightingale Cr
Sheldon Dr
Cambridge Dr
Hessell Rd
Allardice Pde
Lyrebird Gdns
Mittagong Ct
Warrawong Dr
Cooma Ct
Magarra Cr
Adelong Ct
Valley View Ct
Glendale Cr
Tenandra Ct
Bangalay Pl
Coolabah Gr
The Gateway
Bowen Ct
Avebury Dr
Timbarra Way
Hillview Pl
Lydia Mary Dr
Sturrock Ct
Maryn Cl
Quarry Hills Dr
Lodge Cr
Clark Ct
Collins Cr
Sweeney Dr
Woodlands Cr
Mansfield St
Golf Links Rd
Lisburn Way
Glenisla Way
Hancock Dr
Dahlen Pl
Turella Cl
Murndal Ct
Enterprise Av
Intrepid St
Jane St
Gardiner St
Inglis Rd
Hazeldene Ct
Graneel Gr
Lyall Rd
Miller St
Roundhay Ct
Brisbane St
Peel St
Burr Hill Ct
Anne St
Queens Ct
Ayr Ct
York Rd
Rheanva St
Mcnabb St
Kramer Dr
Outlook Dr
Shute Av
Russel Av
Panoramic Tce
Caravelle Ct
Alastair Dr
Sittella Dr
Blue Wren Pl
Crown Pl
Aitken Ct
Lorikeet Dr
Bower Ct
Leemak Cr
Whistler Dr
Cambridge Dr
Roxby Ct
Pembroke Ct
Wembley Dr
Logan Pl
Ellaswood Cl
Lawrence Dr
Ashford Ct
Balfour Ct
Werona Ct
Selwood Ct
Royston Av
Savanna Ct
Christine Av
Cowper Rise
Chiltern Ct
Bournevale Dr
Balmain Dr
Avebury Dr
Dirkala Rtt
Barellan Mews
Temora Rise
Hylard Ct
Newsom Ct
Hasken Ct
Gaylard Ct
Harley Ct
Camley Ct
Rydaldene Way
Stylebawn Dr
Adare Ct
Nevada Ct
Denham Pl
Casey Dr
Ernst Wanke Rd
Narre Warren Township D.S.
Telford Dr
Emerson Ct
Hibberd Ct
Dalpura Ct
Farnsworth Ct
Yaldara Dr
Bayliss Ct
Hepburn Ct
Kuranda Cr
Conrait Ct
Glenbrae Ct
Shand Ct
Grenville Ct
Florence Av
Lexcen Cl
Bertrand Cl
William Rd
Vista Ct
Harding Ct
Princes Hwy
Ezard Cl
Dunnell Rise
Van Der Haar Av
Foulds Ct
Duckworth Cl
Heard Cl
Walsh Rtt
Hawker Gdns
Neagle Mews
Watson Gdns
Madden Rtt
Daniher Ct
Mason Way
Greystoke Ct
Coniston Av
Penrith Ct
Windermere St
Millwood Av
Ambleside Cr
Derwent Ct
Margaret St
Evan St
Clyde Rd
Reserve St
Gloucester Av
Langmore Lane
Mansfield St
Wheeler St
Rutland Rd
Wilson St
Marygate Pl
Edwardes St
Palmerston St
Elgin St
Bain St
Peel St
High St
Cordt Ct
Renwarl Ct
Melilla Ct
Grantham Cr
Fyffe St
Biralee Ct
Andval Ct
Milparinka Way
Melville Park Dr
Edrington Park Dr
Ryan Ct
Salisbury Ct
Fairholme Blvd
Canning Dr
Astrid Ct
Sherman Ct
John Fisher Dr
Kangan Dr
Wilona Way
Piermont Dr
Melzak Way
Chong Ct
Cindy Ct
Sing Cr
Chin Ct
Dempster Way
Eis Ct
Orsino Pl
Rodlarni Cr
Sarah - Louise Pl
Terri - Ester Dr
Janna Pl
Blue Gum Ct
Immy Pde
Tralee Cct
Sallybrook Cct
Wattlebird Ct
Kinsale View
Bellevue Dr
Stefan Dr
County Dr
Gwendoline Dr
Prime Ct
Hyland Ct
Howitt Ct
Nullica Ct
Mahogany Av
Parkhill Dr
Coowarra Way
Jerich Ct
Mitre Ct
Yate Mews
Tiba Ct
Argyle Ct
Grant Ct
Formosa Ct
Aurea Ct
Nandina Rd
Coronata Ct
Pendula Ct
Darling Way
Lantana Dr
Woodlands Cr
Leonard Av
Adelaide Ct
Mirrabook Ct
Parkhill Dr
Shimmers Av
Av
Flood Modelling completed by Melbourne Water, December 1989. Map Produced by VicSES February 2018.
CITY OF CASEY
1% AEP (100yr ARI) Flooding
14. Berwick Township Drain (Berwick)
Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
1% Annual Chance Flash Flood Extent (Depth Unavailable)
Commercial Precinct
Melbourne Water Retarding Basin
Melbourne Water Stormwater Drain
River / Creek
Bicycle / Walking Trail
Bus Route (PTV)
Embankment
Levee
Fire Station
Hospital
Water Storage
Kindergarten / Child Care
School / College
Nursing Home / Aged Care
Place Of Worship
Community Centre
Telephone Exchange
1% Annual Chance Over-Floor Flooding Risk
CASEY
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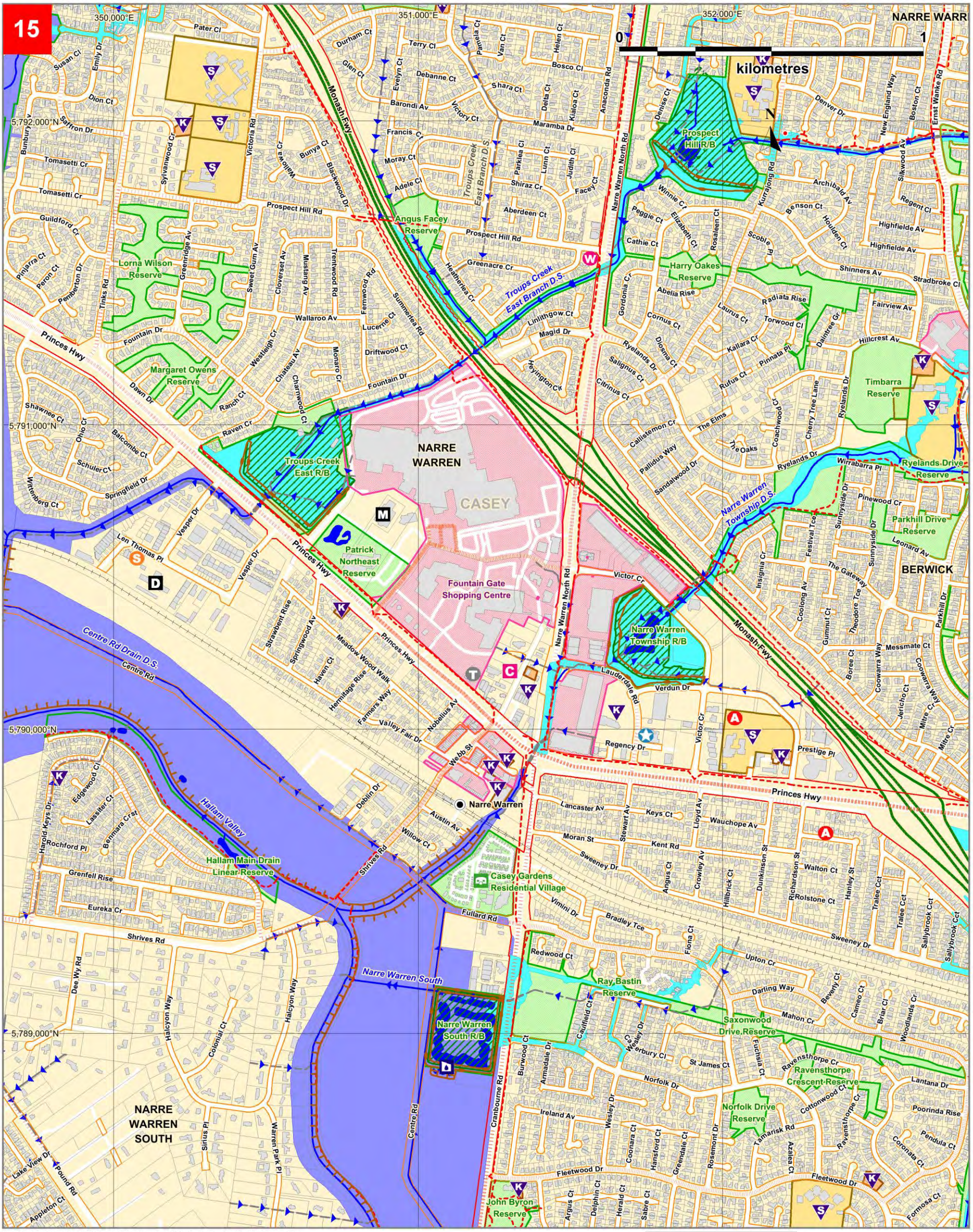


Flood Modelling completed by Melbourne Water, December 1989. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

15. Hallam Valley Contour Drain (Narre Warren)

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Retarding Basin
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Embankment
- Levee
- Municipal Depot
- Municipal Offices
- Ambulance Station
- Kindergarten / Child Care
- School / College
- Victoria State Emergency Service
- Place Of Worship
- Community Centre
- Telephone Exchange
- 1% Annual Chance Over-Floor Flooding Risk
- Police Station
- Pumping Station

16

Princes Hwy
347,000°E
348,000°E
349,000°E
5,792,000°N
5,791,000°N
5,790,000°N
Assembley Dr
South Gippsland Fwy
DANDENONG SOUTH
GREATER DANDENONG
Estate for One R/B
Alexander St
Albert Rd
Regal Av
Muiguthrie Ct
Tara Ct
Marson Cr
Landhill Ct
Legend Ct
Marjoram Cl
Saffron Dr
Ern Barker Reserve
Saffron Drive Reserve
Fitzgerald Rd D.S.
Cardamon Dr
Homewood Blvd
Hyssop Dr
Emmy Dr
Dookie Ct
Susan Ct
Ashley Ct
Dion Ct
Annura Ct
Bunbury Av
Wynen Ct
Saffron Dr
Tomasetti Ct
Tess Ct
Sunburst Ct
Guildford Cr
Dianella Ct
Ken Browne Reserve
Highgate Pl
Pinjarra Ct
Peron Ct
Pemberton Dr
Eton Pl
Tinks Rd
Wilga Ct
Princes Hwy
Dansu Ct
Abbott Rd
Decor Dr
Becon Ct
HALLAM
Princes Domain D.S.
Carl Ct
Conquest Way
Siddons Way
Technology Cct
National Dr
Westpool Dr
Hallam South D.S.
Hallam South Rd
Melverton Dr
Star Cr
Apollo Dr
Wedgewood Rd
Empire Way
CASEY
Tolmie Rise
Rokeby Cl
Glenburn Dr
Thornton Cl
Delatite Ct
Henlow Rise
Anthony Ct
Hintchissen Dr
Sasha Ct
Glenburn Drive Reserve
Eleanore Cr
Acheron Cl
Karrumbra Ct
Hinrichsen Dr
Blundo Ct
Cheshunt Dr
Jabiru Pl
Appila Cl
Buckeye Dr
Troups Creek West Branch D.S.
NARRE WARREN
Buckeye Dr
Cardinia Ct
Forsyth Ct
Schuler Ct
Springfield Dr
Wittenberg Ct
Arrino Cr
Seaton Rise
Yoni Ct
Alsen Ct
Jaya Ct
Pauline Ct
Conica Ct
Bella Cr
Keppel Dr
Colorado Ct
Glencairn Av
Bogong Cl
Cobungra Ct
Hallam
Ogrady Rd
Hallam Valley
Hallam South D.S.
Rimfire Dr
Centre Rd
Waterview Cl
Hallam Valley Contour Drain, Hampton Park
1% AEP Flood Level: 3.33m (15m AHD)
K M Reedy Reserve
Oaktree Drive Reserve
Telford Ct
Brunel Ct
Longford Cl
Rowland Cl
Glenora Way
Willow Dr
Dunnain Cl
Edgerton Cl
Channelle Cl
Kensington Cl
Garfield Cl
Mimmo Cl
Darling Ct
Caroline Pl
Affra Pl
Fulham Ct
Chiswick Ct
Ashford Ct
Oaktree Dr
Hazeldean Ct
Narellan Dr
Verona Dr
Hampton Park East D.S.
Elmswood Ct
Barnsbury Cl
Avoca Cl
Peppermint Ct
The Grange
Proposed Public Golf Course
Hallam Road Linear Reserve
Ashford Close Reserve
Casuarina Ct
Barrington Pl
Wycombe Rise
Rimington Ct
Pollina Ct
Ashdale Ct
Bocking Cr
River Gum Creek Linear Reserve
Manning Cl
Trawalla Ct
Cotham Sq
Coppin Cl
Blackwood Dr
Bunya Pl
Hallam Rd
Justin Cct
Gabrielle Ct
Candlebark Cl
Menindee Tce
Edgewood Cl
Lassiter Ct
Harold Keys Dr
Hampton Park West D.S.
Mary St
Karol Ct
Garnet Ct
Vanessa Dr
Marshall Ct
Sinclair Ct
Jambe Ct
Alma Rd
Pound Rd
HAMPTON PARK
Green Valley Cr
Village Dr
Henry Joseph Moran Park
Robjant St
Willis Cl
Hayes Rd
Winnima Av
Bride Av
Hampton Dr
Robert Booth Reserve
Highland Av
Bellvue Ct
Cottage Ct
Deanswood Rd
Green Valley Cr
Silvan Gr
Delacombe Dr
Bradley Ct
Tarella St
Kong Ct
Lauren Dr
Redleaf Cl
Rivergum Rise
Shrives Rd
Eureka Cr
Wethersdane Dr
Knowles Rd
South Gippsland Hwy
Jenner Ct
Clive St
Marjorie Eastick Reserve
Kerrison Dr
View St
Parkland Av
Ora St
Wren St
Warana Dr
Sue Ct
Craigie Ct
Lewisham Ct
Kilberry Blvd
Pound Rd

Flood modelling completed by Melbourne Water, March 2001. Map Produced by VicSES February 2018.

Building
Area of Interest
Waterbody
1% Annual Chance Flash Flood Extent (Depth Unavailable)
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
Shopping Centre
Melbourne Water Retarding Basin
Melbourne Water Stormwater Drain
Creek / Waterway
Bicycle / Walking Trail
Bus Routes (PTV)
Embankment
Levee
School / College
Kindergarten / Child Care
Place Of Worship
Nursing Home / Aged Care
Telephone Exchange
1% AEP Over-Floor Flooding Risk
Fire Station
Stream Level Gauge & 1% AEP Flood Level
Rain Gauge
Emergency Coordination Centre

CASEY

CITY OF CASEY

1% AEP (100yr ARI) Flooding

16. Hallam Valley Contour Drain (Hampton Park)

N
0
500
metres

SES
Victoria
Melbourne Water

17

355,000°E 356,000°E 357,000°E 358,000°E

0 1

kilometres

N

5,795,000°N 5,794,000°N 5,793,000°N 5,792,000°N

NARRE WARREN NORTH

HARKAWAY

CASEY

EMERALD

CARDINIA

GUYS HILL

BERWICK

Berwick

Harkaway Rd

Chadwick Rd

Hyde Hill Rd

Halleur Rd

Rowallan Av

Noack Rd

King Rd

Farm Lane

Beaumont Rd

Buchanan Rd

Glen Moidart Dr

Mallaig Rise

Baker Rd

George Rae Av

St Fort Ct

Marks Ct

Old Coach Rd

Casey Dr

Beaumont View Lane

Reserve

Berwick T34

Berwick H.l.

Boundary Rd

Manestar Rd

Morris Dr

Foott Rd

Fraser Av

Brennan Av

Borchardt St

Montuna Gr

Langridge St Drain

Cardinia Creek

Stoney Creek

Council Reserve

Grasmere Creek

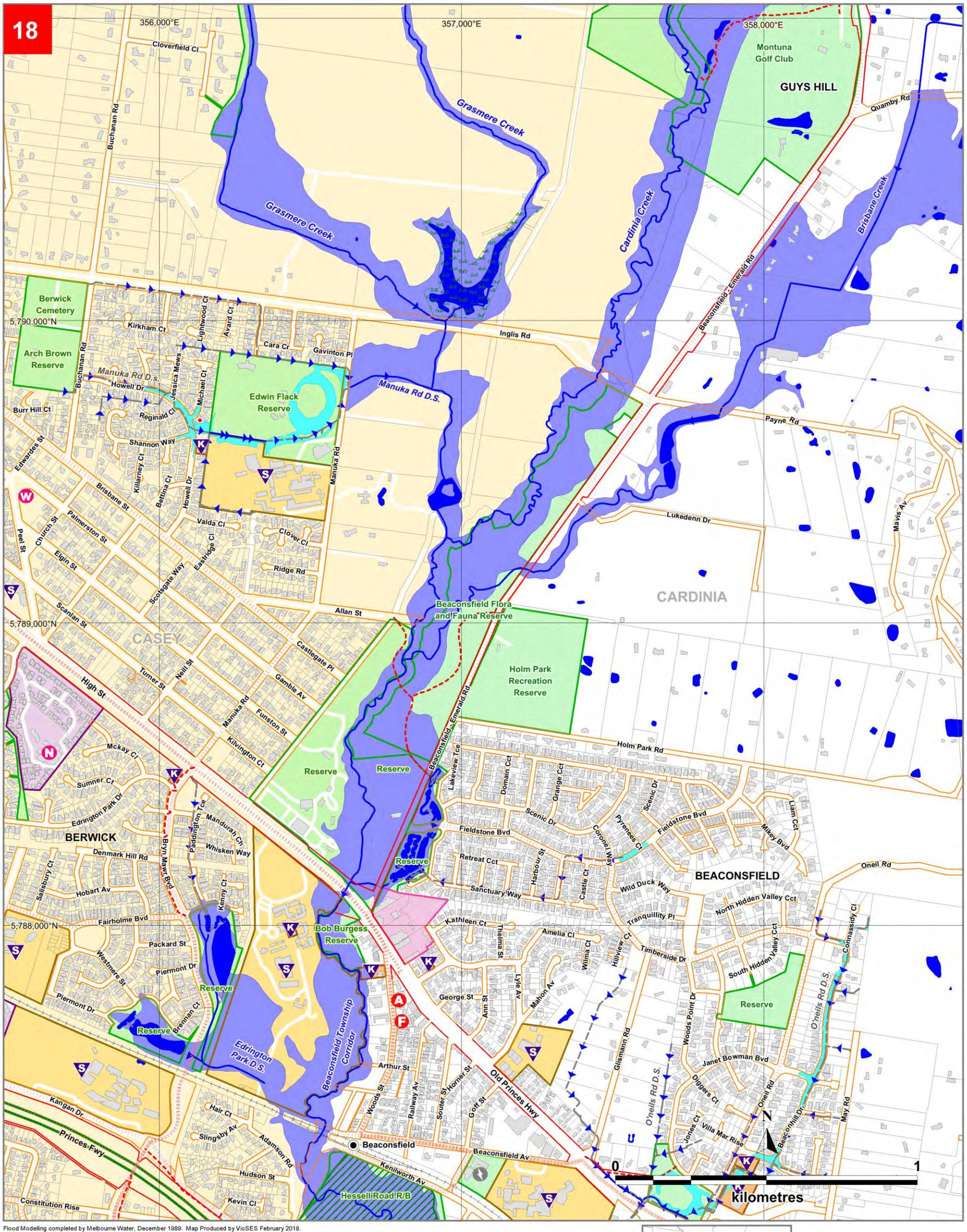
Flood Modelling completed by Melbourne Water, December 1989. Map Produced by VicSES February 2018.

Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
River / Creek
Bicycle / Walking Trail
Bus Route (PTV)
Rain Gauge

CITY OF CASEY

1% AEP (100yr ARI) Flooding

17. Cardinia Creek (Harkaway)



Flood Modelling completed by Melbourne Water, December 1989. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

18. Cardinia Creek (Berwick)

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Commercial Precinct
- Melbourne Water Retarding Basin
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Ambulance Station
- Fire Station
- Kindergarten / Child Care
- School / College
- Nursing Home / Aged Care
- Place Of Worship
- Power Terminal Station
- 1% Annual Chance Over-Floor Flooding Risk

19

357,000°E
358,000°E
359,000°E
5,786,000°N
5,785,000°N
5,784,000°N
5,783,000°N

BEACONSFIELD
BERWICK
OFFICER
CASEY
CARDINIA
CLYDE NORTH
OFFICER SOUTH

Princes Hwy
Old Princes Hwy
Princes Fwy
Beaconsfield - Nar Nar Goon Rd
Kenilwood Av
Rix Rd
Grices Rd
Lecky Rd
Handford Lane
Macreadie Dr
Earlsfield Dr
Hartsmere Dr
Windsor Dr
Royal Ct
Carlisle Dr
Portchester Blvd
Lancaster Way
Hammerwood Grn
Chatsworth Ct
Tantallon Bvd
Brunt Rd
Thomas St
Desmond Ct
May Rd
Whiteside Rd
Panorama Av
Ludlow Ct
Lexington Cr
Park Central Av
Stephens Rd
Soldiers Rd
Jarryd Cr
Brent Ct
Dryden Ct
Abbeydale Ct
Edward Ct
Kilsmere Dr
Maybury Ct
Mitchell Ct
Earlsfield Dr
Daventry Ct
Hollington Way
Wordsworth Dr
Newbury Dr
Brookvale Cl
Kenilworth Av
Trovita Dr
Hazelnut Blvd
Como Pde

Cardinia Creek R/B
O'neils Rd D.S.
Reserve
Blue Gum Park Eastside
Cardinia Creek
Cardinia Creek Drop Structure

Cardinia Creek Drop Structure, Officer South
1% AEP Flood Level: 3.2m (30.5m AHD)

N
0
1
kilometres

Flood Modelling completed by Melbourne Water, December 1989. Map Produced by VicSES February 2018.

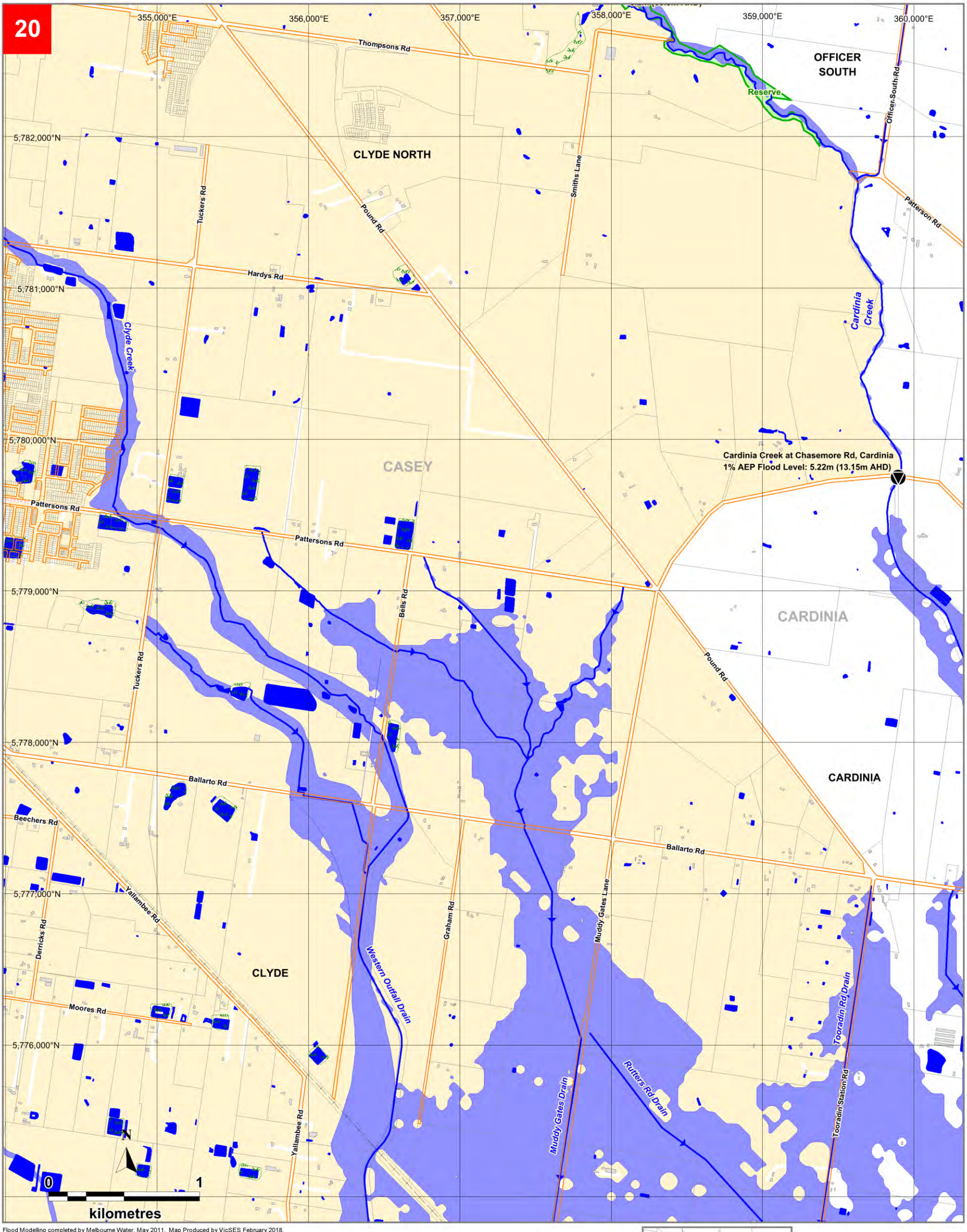
- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Flash Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin
- Natural Wetland
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Embankment
- Caravan Park
- Kindergarten / Child Care
- School / College
- Telephone Exchange
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge

CASEY

CITY OF CASEY

1% AEP (100yr ARI) Flooding

19. Cardinia Creek (Clyde North)


20
355,000°E
356,000°E
357,000°E
358,000°E
359,000°E
360,000°E
Thompsons Rd
OFFICER SOUTH
Reserve
Officer South Rd
5,782,000°N
CLYDE NORTH
Tuckers Rd
Pound Rd
Smiths Lane
Patterson Rd
Hardys Rd
5,781,000°N
Clyde Creek
Cardinia Creek
Cardinia Creek at Chasemore Rd, Cardinia
1% AEP Flood Level: 5.22m (13.15m AHD)
5,780,000°N
CASEY
Pattersons Rd
Pattersons Rd
5,779,000°N
Bells Rd
CARDINIA
Tuckers Rd
Pound Rd
5,778,000°N
Ballarto Rd
CARDINIA
Beechers Rd
Ballarto Rd
5,777,000°N
Yallambee Rd
Derricks Rd
Graham Rd
Muddy Gates Lane
CLYDE
Western Outfall Drain
Moores Rd
Tooradin Rd Drain
5,776,000°N
Muddy Gates Drain
Rutters Rd Drain
Tooradin Station Rd
Yallambee Rd
N
0
1
kilometres
Flood Modelling completed by Melbourne Water, May 2011. Map Produced by VicSES February 2018.
Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
Natural Wetland
Melbourne Water Stormwater Drain
River / Creek
Bicycle / Walking Trail
Bus Route (PTV)
Stream Level Gauge & 1% AEP Flood Level
Rain Gauge
CASEY
CITY OF CASEY
1% AEP (100yr ARI) Flooding
20. Clyde Creek (Clyde)
SES
State Government Victoria
Melbourne Water
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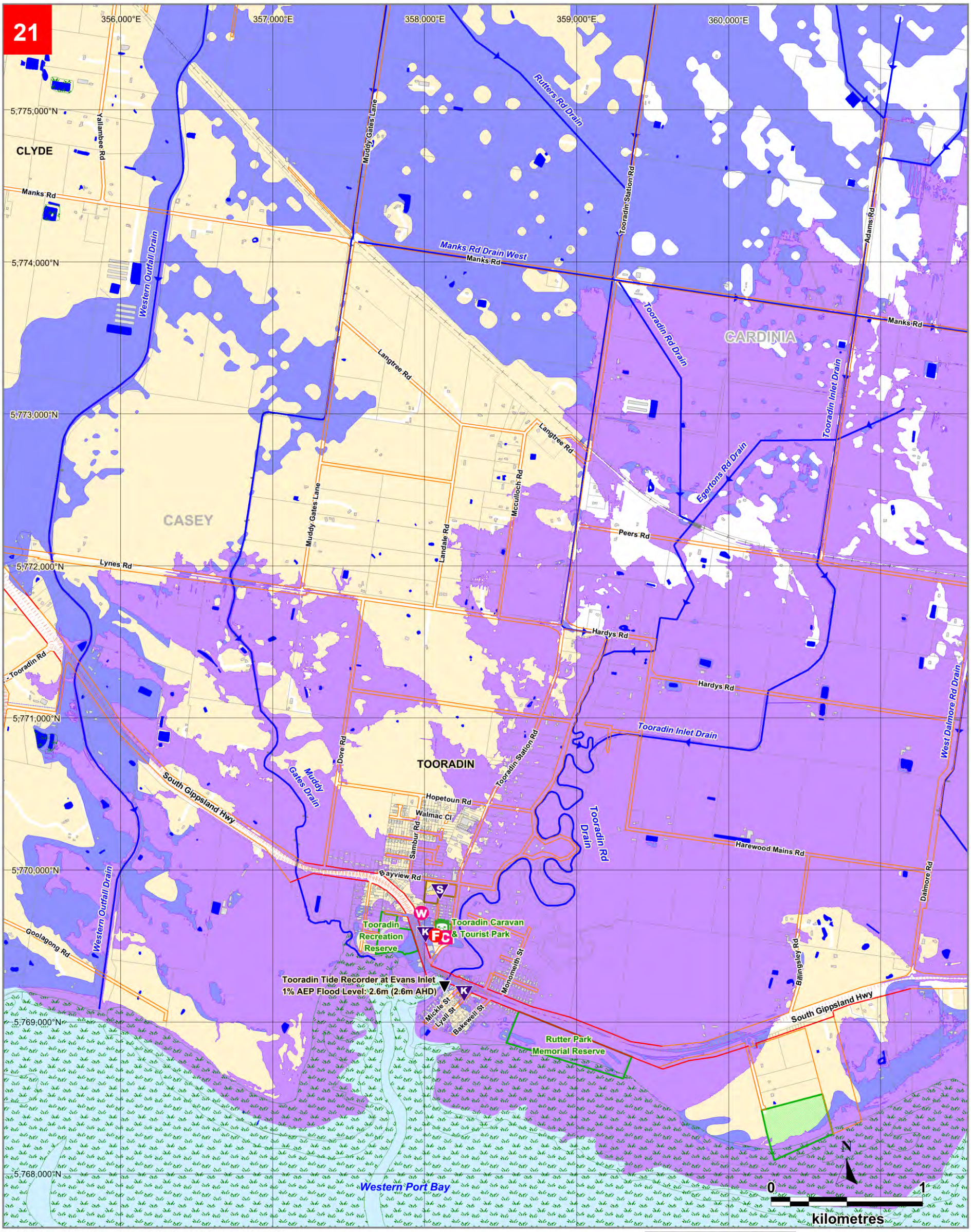


Flood Modelling completed by Melbourne Water, May 2011. Map Produced by VicSES February 2018.

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Storm Surge Flood Extent (Depth Unavailable)
- Natural Wetland
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Community Centre
- Stream Level Gauge & 1% AEP Flood Level
- Caravan Park
- Fire Station
- Kindergarten / Child Care
- School / College
- Place of Worship

CITY OF CASEY

1% AEP (100yr ARI) Flooding

21. Western Port Bay (Tooradin)

22

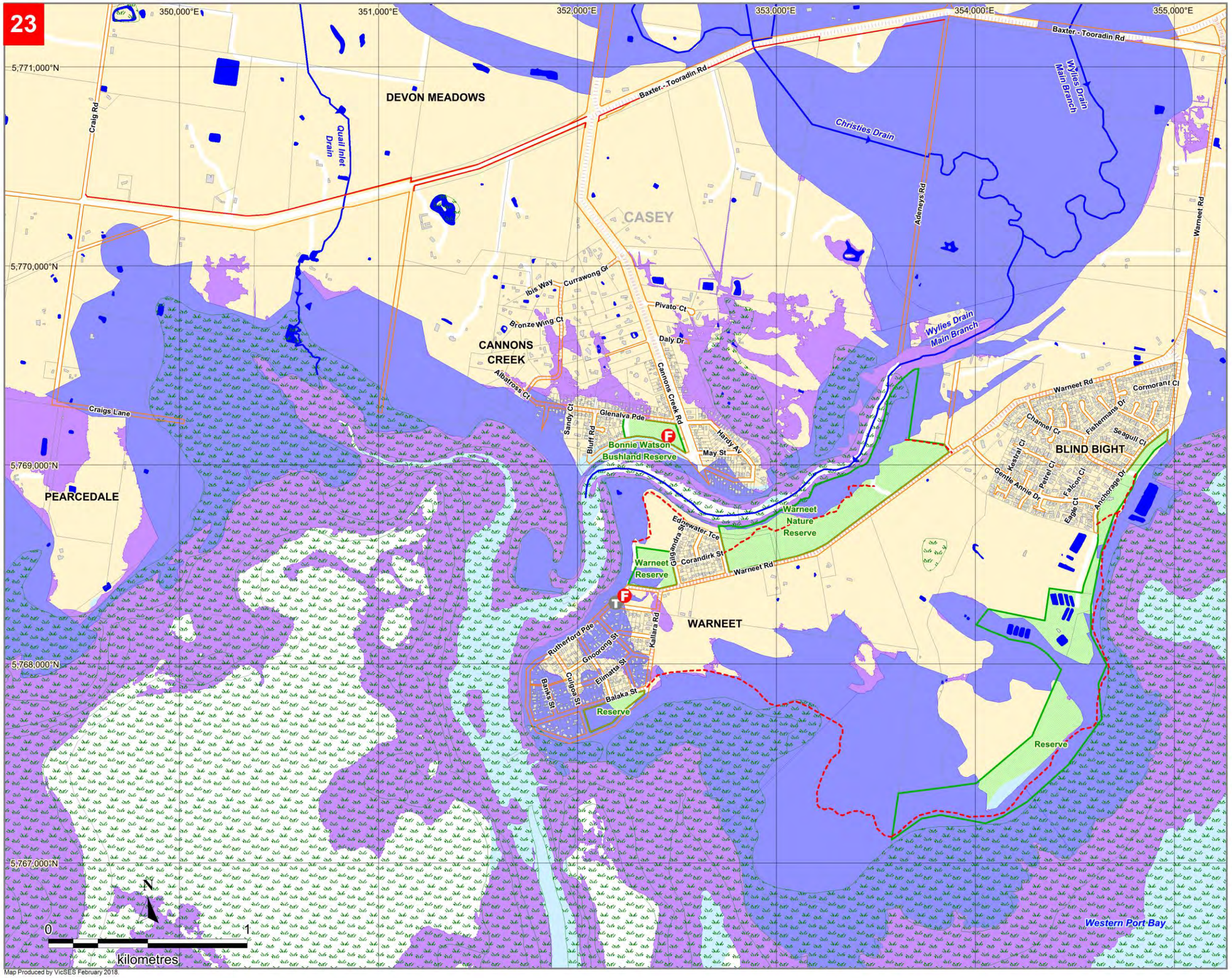
Flood Modelling completed by Melbourne Water, May 2011. Map Produced by VicSES February 2018.

CITY OF CASEY

1% AEP (100yr ARI) Flooding

22. Wylies Drain (Devon Meadows)

Building
Area of Interest
Waterbody
1% Annual Chance Riverine Flood Extent (Depth Unavailable)
1% Annual Chance Storm Surge Flood Extent (Depth Unavailable)
Natural Wetland
Melbourne Water Stormwater Drain
River / Creek
Bicycle / Walking Trail
Bus Route (PTV)
Community Centre
Fire Station
School / College
Place of Worship
Telephone Exchange


23
350,000°E
351,000°E
352,000°E
353,000°E
354,000°E
355,000°E
5,771,000°N
5,770,000°N
5,769,000°N
5,768,000°N
5,767,000°N
DEVON MEADOWS
CASEY
CANNONS CREEK
PEARCEDALE
WARNEET
BLIND BIGHT
Baxter - Tooradin Rd
Craig Rd
Quail Inlet Drain
Christies Drain
Wylies Drain Main Branch
Adeneys Rd
Warneet Rd
Ibis Way
Currawong Gr
Bronze Wing Ct
Pivato Ct
Daly Dr
Albatross Ct
Cannons Creek Rd
Craigs Lane
Sandy Ct
Bluff Rd
Glenalva Pde
Bonnie Watson Bushland Reserve
May St
Hardy Av
Cormorant Cl
Fishermans Dr
Seagull Cl
Channel Cr
Kestral Ct
Petrel Cl
Falcon Cl
Anchorage Dr
Gentle Annie Dr
Eagle Ct
Edgewater Tce
Gilgandra St
Corandirk St
Warneet Nature Reserve
Warneet Reserve
Rutherford Pde
Gnoorong St
Elmatte St
Balaka St
Banks St
Culgoa St
Kallara Rd
Reserve
Western Port Bay
0
1
kilometres
N
Map Produced by VicSES February 2018.
Building
Area of Interest
Waterbody
1% Annual Chance Stormsurge Flood Extent
1% Annual Chance Riverine Flood Extent
Natural Wetland
Creek / Waterway
Bicycle / Walking Trail
Bus Routes (PTV)
Fire Station
Telephone Exchange
CASEY
CITY OF CASEY
1% AEP (100yr ARI) Flooding
23. Wylies Drain Main Drain (Warneet)
SES
Victoria
Melbourne Water
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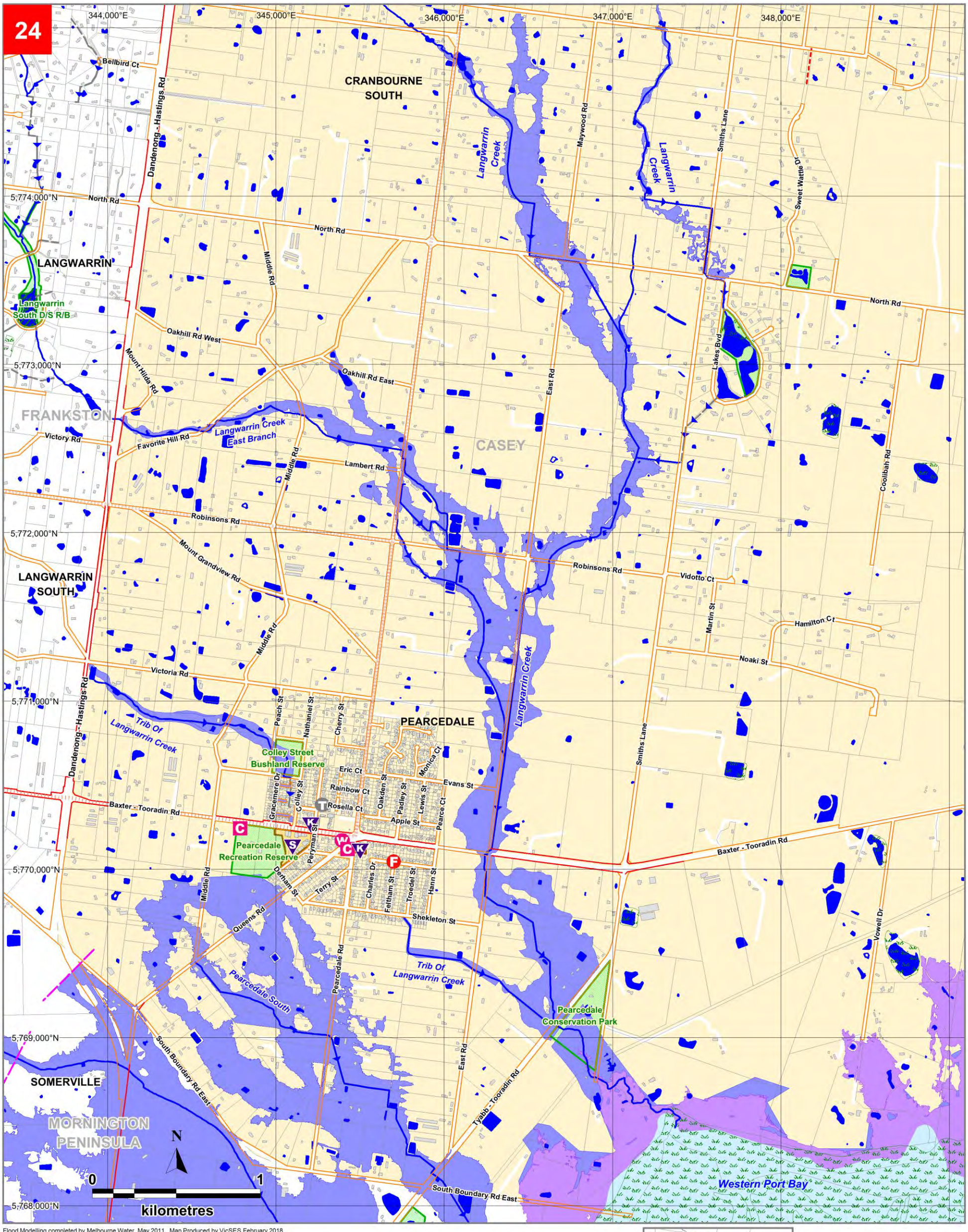


Flood Modelling completed by Melbourne Water, May 2011. Map Produced by VicSES February 2018.

- Building
- Area of Interest
- Waterbody
- 1% Annual Chance Riverine Flood Extent (Depth Unavailable)
- 1% Annual Chance Storm Surge Flood Extent (Depth Unavailable)
- Natural Wetland
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Flood Model Extent
- Fire Station
- School / College
- Place of Worship
- Telephone Exchange
- Kindergarten / Child Care
- Community Centre

CITY OF CASEY

1% AEP (100yr ARI) Flooding

24. Langwarrin Creek (Pearcedale)

APPENDIX G – CATCHMENT SCHEMATICS

Schematics detailing the drainage catchments relevant for this municipality have been included in this Appendix. 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.

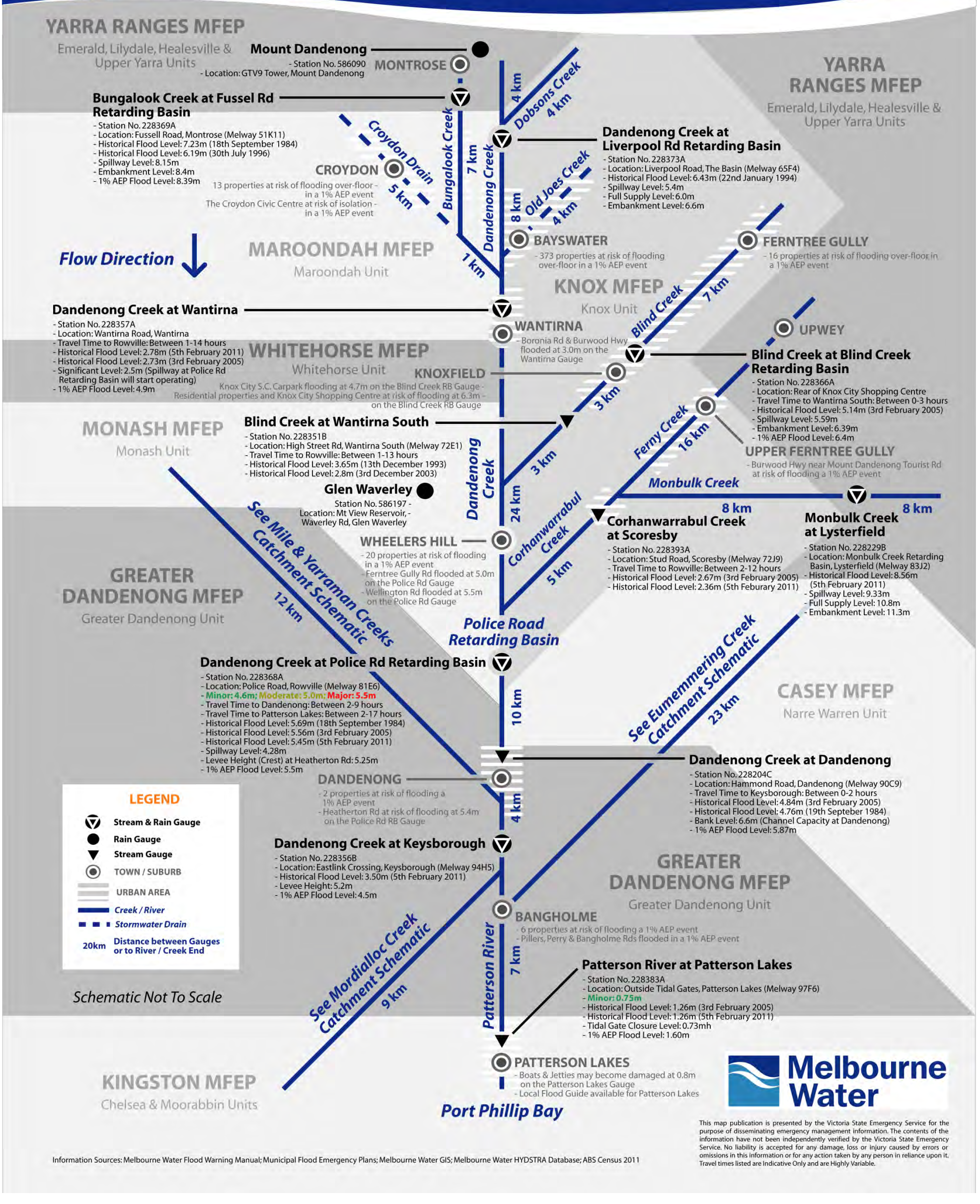
The schematics also detail the response boundaries for SES Units and local government, and provide a reference link to the corresponding Municipal Flood Emergency Plan.

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 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.

Dandenong Creek Catchment Schematic

Version 3 - September 2017



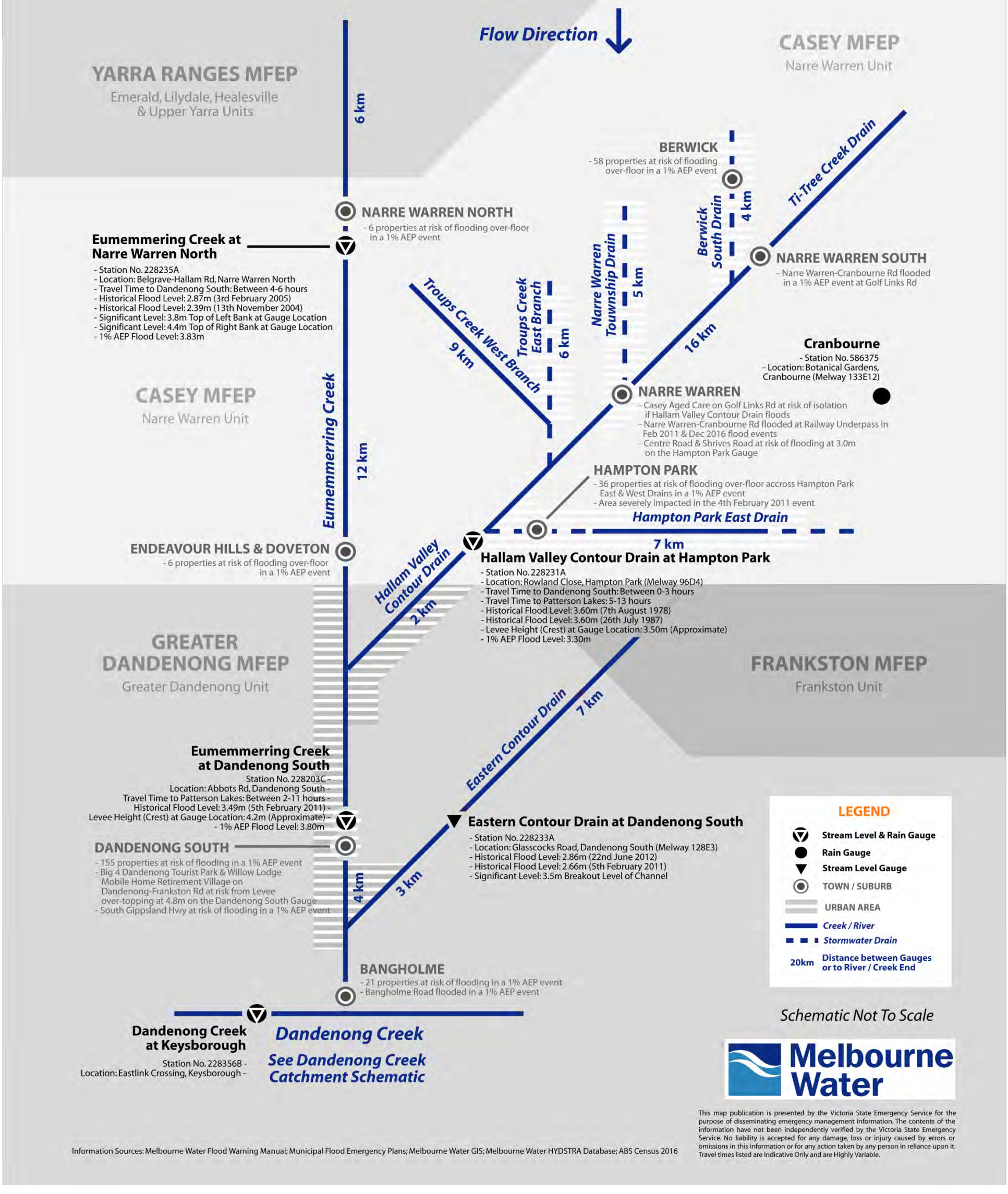
Melbourne Water

This map 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. Travel times listed are Indicative Only and are Highly Variable.

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2011

Eumemmerring Creek Catchment Schematic

Version 4 - March 2018



Schematic Not To Scale

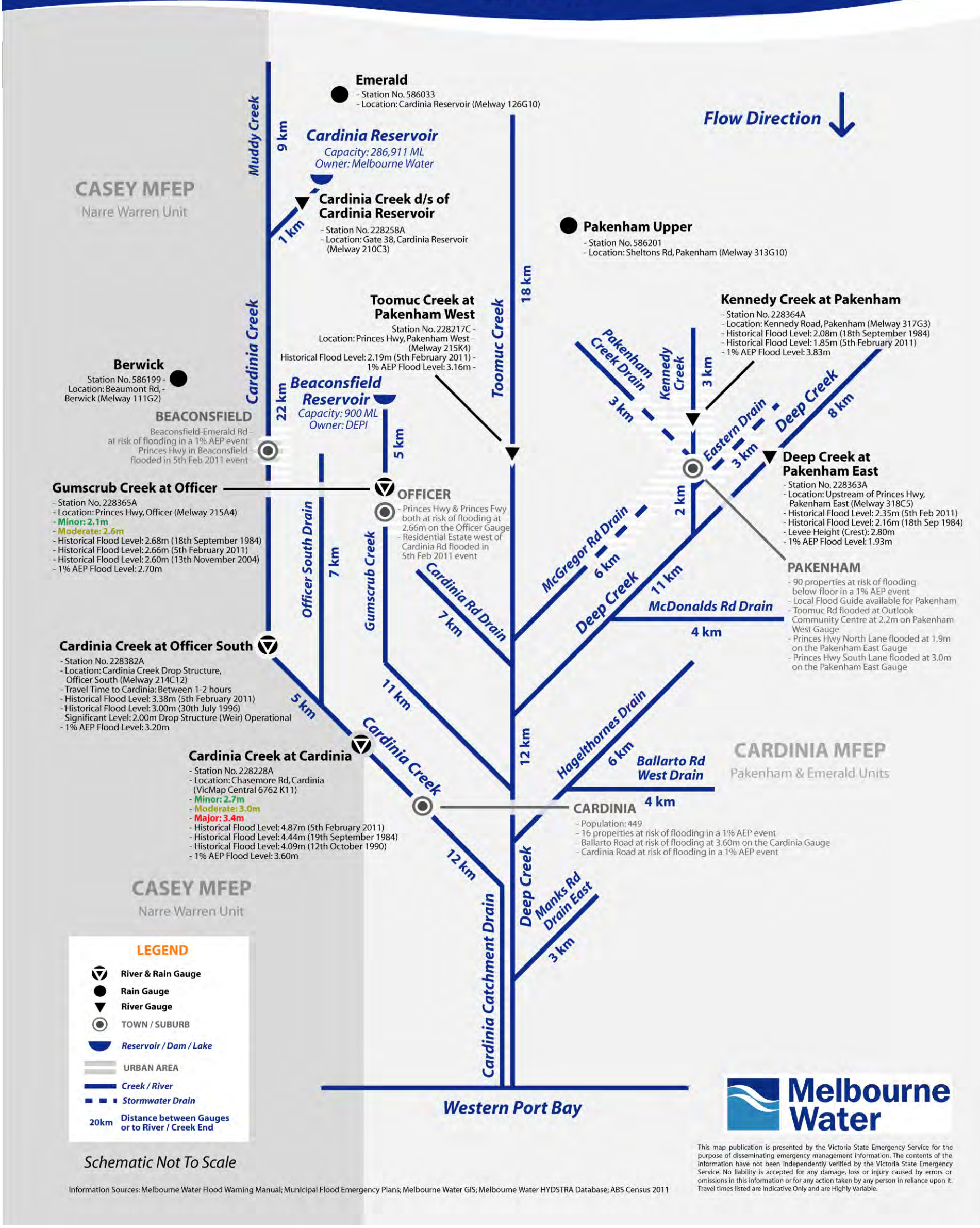
Melbourne Water

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

This map 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. Travel times listed are Indicative Only and are Highly Variable.

Cardinia Creek Catchment Schematic

Version 1 - January 2014



Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2011

APPENDIX H – SANDBAG ARRANGEMENTS

GENERAL

Appropriately placed sandbags can help reduce the impact of flooding to residences, businesses and infrastructure. While sandbags will not completely stop all floodwater, they may reduce the amount of water entering properties.

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

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 City of Casey MEMP.

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

City of Casey MERO will liaise with the VICSES Central Region RDO/ IC (as appropriate) to ensure effective coordination of listed resources.

Sandbags will be filled in accordance with the VICSES Sandbag Quick Reference Guide and the VICSES Statewide Guideline- Sandbags. A short video depicting the filling procedures and the correct usage of sandbags is available at https://www.youtube.com/watch?v=-_T--I3b-34&list=PL428FCA686837ADED (Sandbagging demonstration- vicsesTV on YouTube).

Sand may be obtained from the suppliers/locations noted below and as stated in the VICSES MOU: Sand Supply.

OPERATIONAL

Sandbag Storage Locations

Sandbags may be obtained from any of the locations as noted below.

Organisation	Location	Number of Sandbags	Estimated Response Time	Contact
Cardinia Shire Council Depot	Depot address	0	0-0.5 hrs business hours 1-2 hrs after hours and weekends	
Pakenham VICSES Unit	780 Princes Highway Pakenham	2000	1Hr	
VICSES Central Region	6/3-5 Gilda Ct Mulgrave	10000	2Hr	Via CTDO
Other				

Table H1- Sandbag storage locations within the Shire of Cardinia and adjoining locations

Sand Suppliers

In large events, or when local supplies have been exhausted, supply will be in accordance with *VICSES- Supplier MOU: Sand Supply*. VICSES FOG (Field Operation Guide) suggests washed river sand as the preferred material.

A heavy bodied or sandy soil is most desirable for filling sandbags, but any usable material at or near the site has definite advantages. Gravelly or rocky soils are generally poor choices because of their permeability. Filled bags of earth material will deteriorate quickly. Sand/ fill material should be free of salt and contaminants where possible.

Organisation	Location	Delivery Capability	Restrictions	Contact
Cardinia Shire Council Depot	Depot address	Up to 5m3		
Koo Wee Garden & Soil Supply Pty Ltd	212 Station St, Koo Wee Rup VIC 3981	20m3	Gravel Entrance	59971575
Berwick sand and soil	29 Bald Hill Road Pakenham	30m3		5941 1000
Officer Garden & Building Supplies	405 Princes Hwy, Officer	30m3		5943 1229

Table H2- Sand Suppliers and locations within the Shire of Cardinia and adjoining locations

Sandbag Collection Points

Sandbag collection points may be established at the IC's discretion and as conditions permit. Potential locations are noted below. Note that locations documented below are potential sites only and will not be appropriate for use in all events.

Location	Address	Area	Operational Restrictions
Cardinia Shire Council Depot			
Pakenham VICSES Unit	780 Princes Highway Pakenham		Need to open restricted parking area

Table H3- Cardinia Shire Council potential Sandbag Collection Points

Residents may purchase sandbags or similar from hardware or garden supply stores for protection of residential property or businesses if a sandbag collection point is not available to the public. Some locations may include:

- Bunnings
- Blackwoods
- Masters

Machinery Supply

Appliances documented below will be required when undertaking sandbagging operations

Organisation	Asset	Location	Estimated deployment time	Contact
Cardinia Shire Council	Front End Loader Min lift height 2.5m Min Forward reach 60cm Max bucket width 2.5m	Council Depot	30min	
Cardinia Shire Council	Small tipper (3 tonnes)	Council Depot	30min	
VICSES	Vehicle/ trailer for sandbag transport	Pakenham SES	30min	Via CTDO
VICSES Central Region	Sandbag Fill Machine	Pakenham	1Hr	Via CTDO

Table H4- Machinery/ Vehicles required for Sand Supply in Cardinia

Additional resources from Council that could be utilised to aid response include:

- Backhoe
- Forklift
- Large Tipper

POST OPERATIONAL

Clean up and Disposal

Residents, businesses and Essential Infrastructure owners will be encouraged to contact Council to determine the safest method for disposal of sandbags. Following a flood event within the Municipality, City of Casey will facilitate the disposal of sandbags. VICSES will work in conjunction with City of Casey to ensure the disposal of used sandbags is dealt with under the Community Recovery arrangements as outlined in the EMMV.

APPENDIX H – SEVERE WEATHER (STORM) EVENTS

1. Overview

Casey municipality is susceptible to severe weather events because of a combination of its undulating terrain, urban boundary location and wind exposed properties. Storm events in the City of Casey may be subject to include wind storms, hailstorms, and thunderstorms (including lightning activity). There have also been occurrences of atmospheric downbursts/microburst within Casey and adjacent municipalities.

Severe storm activity could result in injuries and 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.

This Appendix uses Request for Assistance data from the Victoria State Emergency Service (VICSES) to display areas at risk from severe weather events.

2. VICSES requests for assistance

The Victoria State Emergency Service records requests for assistance made by the public during severe weather events. Table 1 below is a breakdown of requests by suburb and damage type during the period June 2010 and January 2017.

Table 1 – Breakdown of Severe Weather Requests for Assistance received by VICSES Narre Warren Unit by suburb

Suburb	VicSES Request for Assistance (Jun 2010 – Jan 2017)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Rescue Persons Trapped *
Carrum Downs	151	42	226	159	
Frankston	492	147	621	382	2
Frankston North	61	6	115	61	
Frankston South	141	42	316	204	
Langwarrin	153	103	278	163	
Langwarrin South	9	3	34	45	
Sandhurst	10	4	2	4	
Seaford	199	71	317	248	
Skye	57	15	70	58	

* Rescue Persons Trapped does not include RFAs for Rescue Road Trapped, Rescue Rail Trapped, Rescue Structure Collapse or Rescue High Angle.

**RFAs relating to Assist fire service, Assist police, Message, SES incident other etc. have not been included in the dataset

Table 2 is a breakdown of requests for assistance by date (month) and damage type. High figures during December 2011 are the result of an intense storm with large hail that moved across the North West metropolitan suburbs on Christmas Day causing significant building damage and some flooding issues.

Table 2 – Breakdown of severe weather requests for assistance received by VICSES Narre Warren Unit within City of Casey by date

Date	VICSES Request for Assistance (June 2010 – Jan 2016)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Rescue Persons Trapped
Jun 2010	10	1	10	9	
Jul 2010	3	2	3		
Aug 2010	7	4	14	13	
Sep 2010	59	1	133	59	
Oct 2010	14	15	13	9	
Nov 2010	24	11	27	22	
Dec 2010	19	23	25	16	
Jan 2011	10	14	13	10	
Feb 2011	6	26	18	9	
Mar 2011	5		6	10	
Apr 2011	2	3	6	3	
May 2011	10	1	6	6	
Jun 2011	16	2	36	15	
Jul 2011	9	1	11	5	
Aug 2011	2		1	4	
Sep 2011	4	4	11	13	
Oct 2011	2		6	6	
Nov 2011	59	149	37	12	
Dec 2011	3	5	7	2	
Jan 2012	21	3	45	28	
Feb 2012	11	2	42	10	
Mar 2012	19	1	44	13	
Apr 2012	27	4	49	21	
May 2012	13	2	25	10	
Jun 2012	10	9	12	6	
Jul 2012	2	1	4	2	
Aug 2012	8	1	8	10	
Sep 2012	24		67	24	
Oct 2012	1	1	3	1	
Nov 2012	2		12	3	
Dec 2012	4	1	25	14	
Jan 2013	9	2	9	6	
Feb 2013	7	6	10	6	
Mar 2013	14	1	24	17	
Apr 2013	1	1	6	4	
May 2013	2	4	3	7	
Jun 2013	12	2	1	2	
Jul 2013	8	2	19	13	
Aug 2013	39	3	37	24	
Sep 2013	25	1	46	28	
Oct 2013	98		149	69	
Nov 2013	8	3	7	6	
Dec 2013	3	5	7	1	
Jan 2014	4		24	11	
Feb 2014	7	1	14	9	
Mar 2014	23	6	9	3	
Apr 2014	10		5	5	
May 2014	1		3	1	
Jun 2014	77	1	99	70	2
Jul 2014	12	1	23	7	
Aug 2014	2	1	10	2	
Sep 2014	23		44	25	
Oct 2014	14	2	23	11	
Nov 2014	10	1	6	6	

Date	VICSES Request for Assistance (June 2010 – Jan 2016)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Rescue Persons Trapped
Dec 2014	9		17	11	
Jan 2015	12	2	28	12	
Feb 2015	7	1	10	12	
Mar 2015	14	1	46	22	
Apr 2015	5	1	4	3	
May 2015	7	1	12	6	
Jun 2015	3		5	4	
Jul 2015	12	3	8	4	
Aug 2015	7	1	5	4	
Sep 2015	7	1		5	
Oct 2015	3	1	5	5	
Nov 2015	6	1	13	6	
Dec 2015	9	2	12	12	
Jan 2016	11	6	44	25	
Feb 2016	3	1	9	6	
Mar 2016	29	3	62	37	
Apr 2016	3	2	10	5	
May 2016	41	14	44	26	
Jun 2016	7	1	16	4	
Jul 2016	47		75	64	
Aug 2016	4	1	2	7	
Sep 2016	5	1	4	1	
Oct 2016	63		101	50	
Nov 2016	16	1	10	8	
Dec 2016	20	28	9	14	
Jan 2017	4	3	7	7	

3. VICSES requests for assistance mapping

Figure 1 – Breakdown of Severe Weather Requests for Assistance received by VICSES Narre Warren Unit within Casey by request type

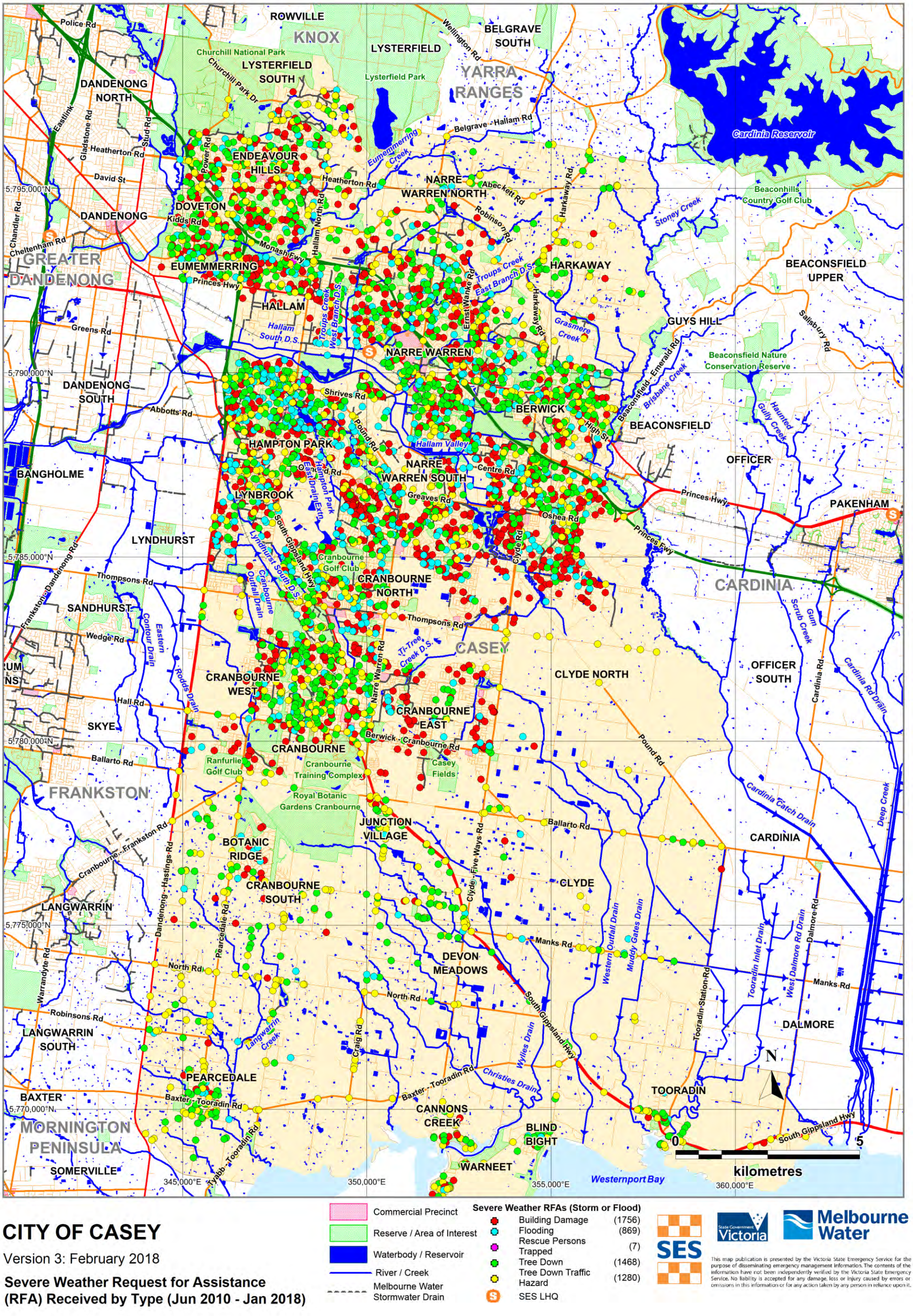
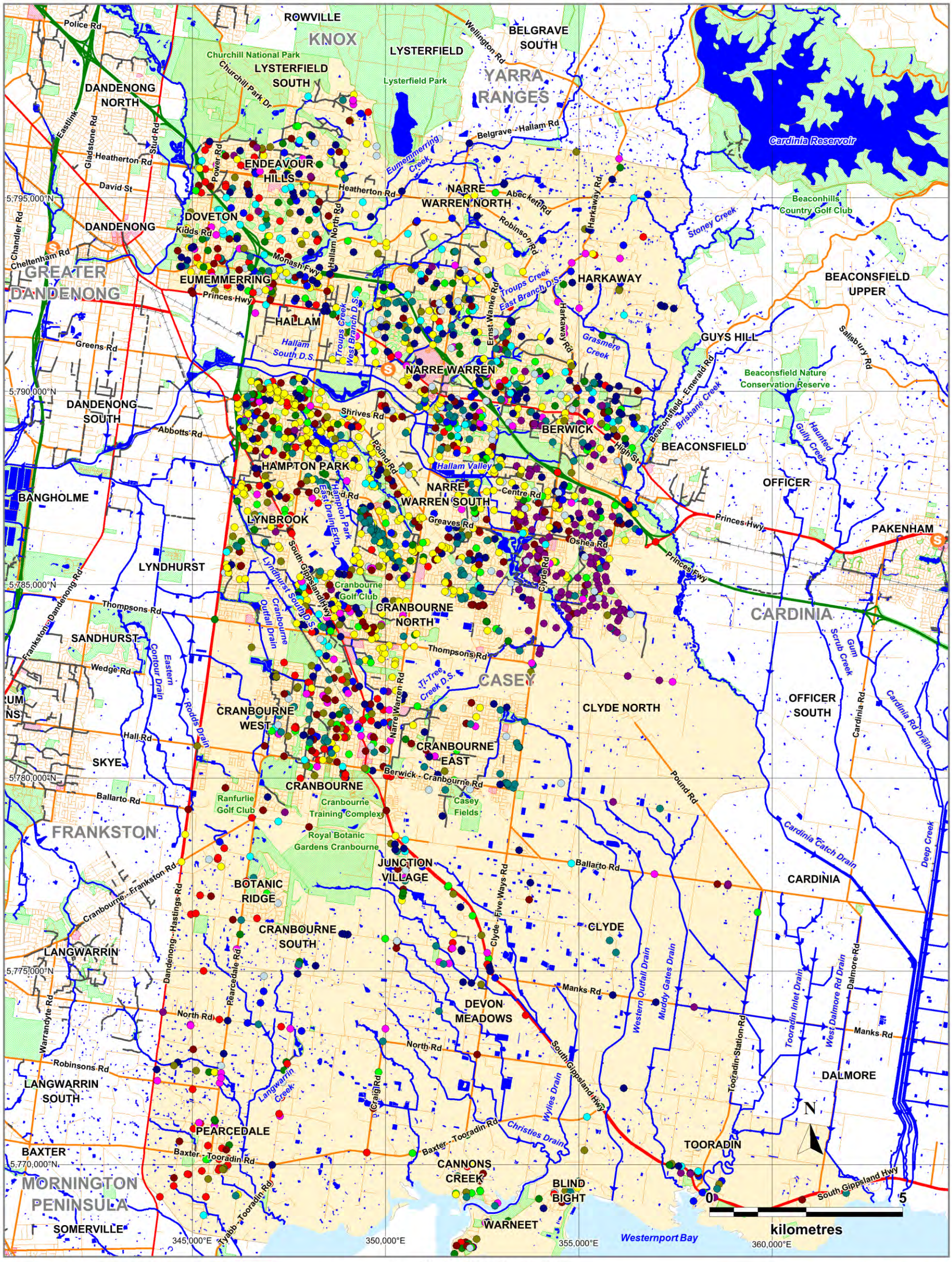


Figure 2 – Breakdown of Severe Weather Requests for Assistance received by VICSES Frankston Unit within Frankston by date



CITY OF CASEY

Version 3: February 2018

Severe Weather Request for Assistance (RFA) Received by Date (Jun 2010 - Jan 2018)

- Commercial Precinct
- Reserve / Area of Interest
- Waterbody / Reservoir
- River / Creek
- Melbourne Water Stormwater Drain
- SES LHQ

Severe Weather RFAs (Storm or Flood)
(By Month > 100 Request Received)

Sept 2009	(189)	Sept 2014	(105)
Feb 2011	(610)	May 2016	(333)
Apr 2012	(120)	Oct 2016	(296)
Sept 2012	(121)	Nov 2017	(190)
Aug 2013	(120)	Dec 2017	(111)
Sept 2013	(123)		
Oct 2013	(258)		
Jun 2014	(140)		

SES

State Government Victoria

Melbourne Water