# Hobsons Bay City Council

# Storm & Flood Emergency Plan

## A Sub-Plan of the Municipal Emergency Management Plan

For Hobsons Bay City Council
And
VICSES Hobson's Bay Unit
Version 3.1

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| 5 | MRM | Hobson's Bay Council | |
| 6 | MERC | Victoria Police | |
| 7 | North West Metro REMI | Victoria Police | |
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| 9 | Unit Controller – Hobson's Bay | VICSES | |
| 10 | Sunshine ICC | VICSES | |
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# Document Transmittal Form/Amendment Certificate

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

Suggestions for amendments to this Plan should be forwarded to:

VICSES Central Region,
239 Proximity Drive
Sunshine West VIC 3020.

| Amendment Number | Date of Amendment | Amendment Entered By | Summary of Amendment |
|---|---|---|---|
| Issue date of Flood Emergency Plan Version 1.0 – 15 May 2013 | | | |
| 2.0 | Jun 2016 | R. Butler | Update of Appendix A, B, C, F and addition of Appendix G. |
| 2.1 | Feb 2018 | M. Taranto | Included Storm Appendix |
| 3.0 | Feb 2019 | R. Butler | Update of Appendices A, B, C, F, G & H |
| 3.1 | Oct 2020 | M Patton | MEMPC endorsement |
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This Plan will be maintained on www.ses.vic.gov.au and/or www.hobsonsbay.vic.gov.au websites.

# List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan:

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

# Glossary

Below are terms defined for the purpose of this Plan:

| Term | Definition |
|---|---|
| **Stormwater drainage system** | A series of drains and waterways into which surface and stormwater flows. Features of a stormwater drainage system can include underground pipe drains, open channels, retarding basins, floodways, waterway improvements, water sensitive urban design, integrated water management systems and environment protection measures. All drainage under 60 ha is maintained and operated by Hobsons Bay City Council |
| **Overland flooding** | Flooding by local runoff caused by heavier than usual rainfall. Overland flooding can be caused by local flow exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage system to overflow. For local government areas this is over the 5 year ARI in residential or over 10yr ARI in commercial/industrial. For Melbourne Water catchment areas this is for all other ARIs up to the 100yr ARI. Note that not all overland flows cause flooding under the definition in the Knox City Service Plan Appendices. |
| **Floodplain** | Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation. |
| **Natural drainage system** | Flow paths which are largely undeveloped by human sources, these include rivers, streams, natural depressions and wetlands. All natural systems greater than 60 ha are managed by Melbourne Water. |
| **Hot spot** | A known flood problem area which has a history of repeat flooding of a road, crossing or property, often highlighted through anecdotal information and customer complaints. It is a localised issue which will vary from council to council. |
| **Stormwater Runoff** | The amount of rainfall that enters the stormwater drainage system, (via pits, pipes, retarding basins, water sensitive structures, harvesting tanks and overland flow paths) after water which is not absorbed into the ground has been taken into account. |
| **Flash flooding** | Sudden unexpected flooding caused by local heavy rainfall or rainfall in another area. Often defined as flooding which occurs within six hours of the rain which causes flooding. |
| **Annual Recurrence Interval (ARI)** | The average, or expected, value of the period between exceedances of a given rainfall or flow total accumulated over a given duration |
| **Annual Exceedance Probability (AEP)** | The probability that a given total rainfall or flow is accumulated over a given duration will be exceeded in any one year |
| **Flood mapping** | The process where the extent of flooding is documented in mapping software based on flood studies and surface elevations |

# Part 1. INTRODUCTION

## 1.1 Municipal Endorsement

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

This MSFEP is a sub plan to the Hobsons Bay City Council Municipal Emergency Management Plan (MEMP), is consistent with the Emergency Management Manual Victoria (EMMV), the Victoria Flood Management Strategy, the Regional Flood Emergency Plan, the State Storm Emergency Plan and the State Flood Emergency Plan, and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the MEMPC.

This Municipal Flood Emergency Plan is a result of the cooperative efforts of the Hobsons Bay City Council MFEPSC and its member agencies.

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

**Endorsement**

D Eyckens

…….. …21/10/2020…….

Chair MEMPC Date

…….. ……22/10/2020……..…..

John Chaplain
Manager, Regional Emergency Management
VICSES Central Region

Date

## 1.2 The Municipality

An outline of the City of Hobsons Bay 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 Hobsons Bay.

As such, the scope of the Plan is to:

- Identify the storm and flood Risk to the City of Hobsons Bay;
- Support the implementation of measures to minimise the causes and impacts of storm and flood incidents within the City of Hobsons Bay;
- 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 flood.

## 1.4 Municipal Flood Emergency Planning Sub Committee (MFEPSC)

Membership of the City of Hobsons Bay Municipal Flood Emergency Planning Sub Committee (MFPC) will comprise of representatives from the following agencies and organisations: (Refer to MFEPSC Terms of Reference?)

- Hobsons Bay City Council, (Chair)
- VICSES - Regional Officer Emergency Management (ROEM)
- VICSES - Unit Controller or representative, Hobson's Bay Unit
- Hobsons Bay City Council representatives,
- Victoria Police - Municipal Emergency Response Co-ordinator (MERC),
- Catchment Management Authority (Melbourne Water) as required,
- Department of Health & Human Services,
- Other agencies as required

## 1.5 Responsibility for Planning, Review and 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 MEFPSC will meet at least once per year.

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

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

## 1.6 Endorsement of the Plan

The MSFEP will be circulated to MFEPC members for comment.

Upon acceptance, the plan is forwarded to the MEMPC for re-endorsement.

# Part 2. PREVENTION / PREPAREDNESS ARRANGEMENTS

## 2.1 Community Awareness for all Types of Storm and Flooding

Details of this MSFEP will be released to the community through local media, VICSES community education programs and Hobsons Bay City Council websites.

VICSES with the support of Hobsons Bay City Council and Melbourne Water will coordinate community education programs for storm and flooding within the council area. (e.g. Local Flood Guides and public events.).

## 2.2 Structural Flood Mitigation Measures

**Appendix A and C** details the structural flood mitigation measures including retarding basins and levees that exist within the Hobsons Bay City Council area:

## 2.3 Non-structural Flood Mitigation Measures

### 2.3.1 Exercising the Plan

Arrangements for exercising this Plan will be at the discretion of the MEMPC. This Plan should be regularly exercised, preferably on an annual basis and reviewed following a significant event.

### 2.3.2 Storm and Flood Warning

Arrangements for storm and flood warning are contained within the State Flood Emergency Plan and State Storm Emergency Plan, the EMMV (Part 3) and on the BoM website.

Hobsons Bay City Council has no local flood warning system arrangements.

### 2.3.3 Flood Wardens

Flood Wardens provide a means of gathering information in real time on flood behaviour along a stream system, and a network for the distribution of community information and warnings to the community along the stream system.

There are no flood wardens within the Hobson's Bay Municipality 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 Regional Duty Officer (RDO) or Incident Controller (IC).

The VICSES RDO or IC will activate agencies as required and documented in the VICSES Central Region Storm and Flood Emergency Plans, the State Flood Emergency Plan or the State Storm Emergency Plan (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 flood within the Hobsons Bay City Council. These agencies will be engaged through the IEMT.

The general roles and responsibilities of supporting agencies are as agreed within the Hobsons Bay City Council MEMP, Part 7 of the EMMV, State Storm and Flood Emergency Plans and the Regional Storm and Flood Emergency Plan.

### 3.1.3 Municipal Emergency Coordination Centre (MECC)

Where activated, the function, location, establishment and operation of the MECC will be as detailed in the City of Hobson's Bay MEMP.

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

In the event that a MECC is not operating, the Hobson's Bay Council MERO will be contacted

### 3.1.4 Escalation

Most storm and flood incidents are of local concern and an appropriate response can usually be coordinated using local resources. However, when these resources are exhausted, the State's arrangements provide for further resources to be made available, firstly from neighbouring Municipalities (on a regional basis) and then on a State-wide basis.

Resourcing and event escalation arrangements are described in Part 3 of the EMMV.

## 3.2 State Emergency Management Priorities

To provide guidance to the IMT and Incident Emergency Management Team (IEMT), the following state 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 response personnel, and;

    b. Safety of community members including vulnerable community members and visitors/tourists

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 assets that considers the cultural, biodiversity, and social values of the environment;

Circumstances may arise where the IC 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 Controller and relevant stakeholders based on sound incident predictions and risk assessments.

## 3.3 Command, Control and Coordination

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

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

### 3.3.1 Control

Functions 5(a), 5(b) and 5(c) at Part 2 of *the Victoria State Emergency Service Act 1986 (as amended)* detail the authority for VICSES to plan for and respond to 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, water and waste water service disruption related incidents and other emergencies

All storm and flood response activities within the City of Hobsons Bay 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 IC will be appointed by VICSES, as the Control Agency, to command and control available resources in response to a storm or flood event on the advice of the Bureau of Meteorology, or other reliable source, that a flood event will occur or is occurring. The 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, VICSES.

Pre-determined Incident Control Centre locations are:

- Sunshine ICC
- Burnley ICC
- Dandenong 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 storms and flooding within the Municipality:

Pre-determined Divisional Command locations may include:

- Brimbank Unit LHQ, Stadium Drive , Keilor Park
- Wyndham West LHQ, Ballan Road, Wyndham Vale

Sector Command locations are to be allocated on an as needs basis

### 3.3.5 Incident Management Team (IMT)

The IC will form an IMT In line with AIIMS principles.

Refer to Part 3 of the EMMV for guidance on IMTs

### 3.3.6 Incident Emergency Management Team (IEMT)

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

Organisations required within the IEMT (including Hobson's Bay Council) will provide an Emergency Management Liaison Officer (EMLO) to the ICC if and as required as well as other staff and / or resources identified as being necessary, within the capacity of the organisation.

Refer to Part 3 of the EMMV for guidance on EMTs.

### 3.3.7 On Receipt of a Flood Watch / Severe Weather Warning

The VICSES RDO, /IC will undertake actions as defined within the Flood Intelligence Cards (**Appendix C**). General considerations by the VICSES RDO/Incident Controller will be as follows:

- Review storm and flood intelligence to assess likely 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 RCC's (if established), SCC (if established), Hobson's Bay Council (as outlined in the MEMP), and 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 Flood Warnings

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

- Develop an appreciation of current flood levels and predicted levels - are floodwaters, rising, peaking or falling?
- Review storm/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 populations may be at risk?
- Determine what the at-risk community need to know and do as the storm/flood develops.
- Warn the at-risk community including ensuring that an appropriate warning and community information strategy is implemented. This includes:
  - The current storm and/or flood situation
  - Storm and/or Flood predictions
  - What the consequences of predicted activity or 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 and/or flood consequence assessment.
- Continue to monitor the flood situation – www.bom.gov.au/vic/flood/
- 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 Central Region Storm and Flood Emergency Plan, and the State Flood and Storm Emergency Plans.

Community information and warnings communication methods available 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, including the VicEmergency website
- 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 (e.g. 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.

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

Other agencies such as CFA, DELWP and VicPol may be requested to assist VICSES with the communication of community 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 Standard Emergency Warning System (SEWS).

DHHS will coordinate information regarding public health and safety precautions.

## 3.5 Media Communication

The IC through the Public Information Unit established at the ICC will manage Media communication. If the ICC is not established the VICSES RDO will manage all media communication. Hobson's Bay City Council will work with the IC to assist with the dissemination of public messaging and/or warnings.

## 3.6 Impact assessments (IA)

Impact assessments can be conducted in accordance with Part 3 of the EMMV to assess and record the extent and nature of damage caused by storms/flooding. This information may then be used to provide the basis for further needs assessment and recovery planning by Hobson's Bay Council, DHHS and other applicable recovery agencies.

The control agency is responsible for coordinating the collection, collation and dissemination of IA information on a whole of government basis.

The purpose, function and conduct of IAs are outlined in the State Flood Emergency Plan and the State Storm Emergency Plan. All IAs should be conducted in accordance with Part 3 of the EMMV

## 3.7 Preliminary Deployments

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

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 and ;

2. Should evacuation be the adopted strategy it must be supported by public information capability and a rescue contingency plan;

3. Where its is 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 the MERC and Hobson's Bay 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 actually triggering the evacuation. This is normal practice but this is insufficient justification for not adopting evacuation.

## 3.9 Evacuation

In Victoria, evacuation is largely voluntary, however in particular circumstances, legislation provides some emergency services with authority to remove people form 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 where possible. VICSES and other agencies will assist where practical. VICSES is responsible for the development and communication of evacuation warnings.

VicPol and/or Australian Red Cross may take on the responsibility of registering people affected by a flood emergency including those who have been evacuated.

Refer to Part 3 of the EMMV for guidance of evacuations for flood emergencies.

There are currently no detailed evacuation arrangements for City of Hobson's Bay.

## 3.10 Flood Rescue

VicPol is the designated Control Agency for water rescue, and 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 flood operations including evacuation, resupply, reconnaissance, intelligence gathering and emergency travel.

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

## 3.12 Resupply

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

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

After the impact, VICSES may assist with the transport of essential items to isolated communities and assist with logistics functions.

Resupply operations are to be included as part of the emergency relief arrangements as outlined in the Hobson's Bay MEMP.

## 3.13 Essential Infrastructure and Property Protection

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

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

Hobsons Bay City Council does not maintain stocks of sandbags. Limited supplies are available through the VICSES Regional Headquarters. The IC will determine the priorities related the use of sandbags, which will be consistent with the strategic priorities.

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of Essential Infrastructure. If time permits, requests for supplementary supply should be carried out in line with the Hobson's Bay MEMP.

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.

Sandbag collection points will be established as needed.

## 3.14 Disruption to Services

Disruption to services other than essential community infrastructure and property can occur in storm and 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 Hobsons Bay.

## 3.15 Levee Management

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

Hobsons Bay City Council, VicPol and VicRoads will carry out their formal functions of road closures. This includes observation and placement of warning signs and, road blocks, to its designated local and regional roads, bridges, walking and bike trails. VicPol may liaise with Hobsons Bay City Council and VicRoads of the need to erect warning signs and / or closed roads and bridges under its jurisdiction. VicRoads are responsible for designated main roads and highways and Councils are responsible for the designated local and regional road network.

VicRoads, VicPol and Hobsons Bay City Council will communicate community information regarding road closures as outlined in the Hobson's Bay MEMP.

## 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.

There are no dams within Hobsons Bay City Council.

## 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 responsibility agency for the critical sewerage asset should undertake the following:

- Advise VICSES and the Hobson's Bay MERO of the security of critical sewerage assets to assist preparedness and response activities in the event of flood;
- Maintain or improve the security of critical sewerage assets;
- Check and correct where possible the operation of critical sewerage assets in times of flood;
- Advise the ICC in the event of inundation of critical sewerage assets.

It is the responsibility of the Hobsons Bay City Council's Environmental Health Officer to inspect and report to the MERO on any water quality issues relating to flooding.

General public health information and messages are provided by Hobson's Bay City Council and DHHS and may contain information that is relevant prior to, during and following an

incident. Information may 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/flood operations as soon as practical following an event.

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

# Part 4. EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS

## 4.1 General

Arrangements for the recovery from a storm or flood incident within the Hobsons Bay City Council area are detailed in the Hobsons Bay City Council MEMP and/or the Municipal Recovery Plan.

## 4.2 Emergency Relief

The IC determines the need for emergency relief services in accordance with Part 4 of the EMMV. ICs 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). This should be carried out in line with the Hobson's Bay MEMP

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

Suitable emergency relief/recovery facilities identified for use during floods are detailed in in the Hobson's Bay MEMP and the Hobson's Bay Relief and Recovery Plan. The MRM will facilitate access to emergency relief/recovery centres as required. The MERO will facilitate access to staging areas as required.

## 4.3 Animal Welfare

Matters relating to the welfare and rescue of livestock (including feeding and rescue) 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

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 Part 4 of the EMMV and the Hobson's Bay Council MEMP.

# APPENDIX A - FLOOD THREATS FOR CITY OF HOBSONS BAY

## General

The City of Hobsons Bay is located in south-west Melbourne, on the northern shore of Port Phillip Bay, between seven and 20 kilometres south-west of the Melbourne CBD. It is approximately 66 square kilometres in area, and includes the suburbs of:

- Altona
- Altona Meadows
- Altona North
- Brooklyn
- Laverton
- Newport
- Seabrook
- Seaholme
- South Kingsville
- Spotswood
- Williamstown and
- Williamstown North.

The municipality has a population of just over95,000 living in almost 34,000 dwellings. Residential areas are predominately low density, with the majority being separate dwellings, with 12% semi-detached, terrace houses or townhouses and 10% flats, units or apartments. One third of the municipality is zoned industrial. This includes some of the State's most significant industries, including petrochemical and petroleum refining industries. There are 8 individual registered major hazard facility sites within Hobsons Bay.

Within Hobsons Bay there are 4 main natural waterways which generally flow in a north west to south easterly direction discharging into Port Phillip Bay. There are also 3 minor natural water courses.

Key Flooding issues that need to be managed within the municipality include:

1. Flash flooding due to pipe blockages from tree roots, broken pipes, debris on grates and runoff unable to enter the pipe network.
2. Foreshore flooding and
3. Riverine flooding from the Skeleton, Laverton, Cherry and Kororoit Creeks.

## 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.

Flooding of residential properties in McIntyre Drive occurs as a result of large flows in Cherry Creek/Lake. Civic Parade in the area of McIntyre Drive also floods in heavy flows causing interruption to traffic.

Merton Street underpass (ford crossing) floods on a regular basis and while flood gates have been installed to prevent traffic crossing the flooded ford, gates are often cut open and cars are consistently being pulled out of the water.

Altona Road/Racecourse Road Ford can flood as a result of large flows in Kororoit Creek. Tidal waters can also influence flooding in this area. Cars are also consistently removed from the ford during flood events.

## Flash Flooding and Overland Flows

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

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

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

Many of the underground drains in Hobsons Bay are under capacity and have generally been designed for 20% AEP storms in residential areas and 10% AEP in Commercial/Industrial areas and are unable to convey run off from larger storms. Some drains, particularly in the area north of Kooringal Golf Club and west of Maidstone Street are influenced by the capacity of the Mulga Street Outfall Drain. Road flooding frequently occurs in heavy rain events. Civic Parade in the vicinity of Sugargum Drive also floods frequently due to grading of the Nellie Street Drain.

Other areas subject to flash flooding are Millers Road just north of Kororoit Creek Bridge, the intersection of Mason Street & Melbourne Road, Douglas Parade north of Burleigh Street and the Strand Williamstown.

## Tidal Flooding and Storm Surges

Moderate to heavy rainfall, coupled with a high or incoming tide from Port Phillip Bay can exacerbate flooding within the municipality or create areas of flooding in and around the drainage network. Due to the proximity of the Municipality to Port Phillip Bay and its flat terrain, tidal flows from Port Phillip 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.

The Esplanade, Altona frequently floods due to storm surges in particular at the end of Sargood Street and Bayview Street with the potential to flood underground parking to some of the properties fronting the Esplanade.

## Description of Major Waterways and Drains

Within the City of Hobsons Bay, there are four main natural waterways within the municipality, totalling approximately 30km. These are (from west to east):

- Skeleton Creek (7.5 km)
- Laverton Creek (5 km)
- Cherry Creek, (6 km) and
- Kororoit Creek (8 km).

These watercourses generally flow in a north west to south easterly direction, discharging into Port Philip Bay.

Skelton Creek rises to the south of Truganina, and flows in a largely natural, meandering channel, through the Cheetham wetlands and into Altona Bay south of Altona Meadows.

Laverton Creek rises to the west of Derrimut and is largely natural in form until it reaches the municipality, when it becomes heavily modified and channelised through Truganina Swamp and then flows into Altona Bay at Altona South.

Cherry Creek rises near Laverton North, and flows in a heavily modified channel in southerly direction through the City of Hobsons Bay and into Cherry Lake before discharging to Altona Bay near Alton Sports Club.

Kororoit Creek rises near Sunbury and flows in a southerly direction through the municipality, via Altona Coastal Park, discharging into Altona Bay.

Detailed schematics of these waterways can be found at **Appendix G**.

There are also several minor natural watercourses within the municipality. They are:

- Kayes Drain
- Laverton East Main drain and
- Paisley Drain.

Lower Stony Creek also flows along Council's eastern border of for approximately 3 km.

| Melbourne Water Drains & Waterways | Suburb/s | Melbourne Water Drains & Waterways | Suburb/s |
|---|---|---|---|
| Blenheim Road Drain | Altona North & Newport | Laverton East Main Drain | Altona & Altona Meadows |
| Burgess Street Drain | Altona North & Brooklyn | Laverton Main Drain | Altona, Altona Meadows & Laverton |
| Burleigh Street Drain | Spotswood | Millers Rd Drain | Altona & Altona North |
| Challis St Main Drain | Newport, Williamstown & Williamstown North | Mulga Ave Drain | Altona |
| Chambers Rd Drain | Altona North | Nellie St Main Drain | Altona & Seaholme |
| Cherrys Main Drain | Altona, Altona North & Seaholme | Newport Workshops Drain | Williamstown & Williamstown North |
| Francis St Main Drain | Brooklyn | Notla Estate Main Drain | Altona |
| Galvin Diversion Drain | Altona | Paisley Drain | Altona North, Williamstown & Williamstown North |
| Humes Main Drain | Altona North | Schutts Estate Main Drain | Spotswood |
| Kayes Drain | Altona, Altona North & Laverton North | Skeleton Creek | Altona Meadows & Seabrook |
| Kororoit Creek | Altona & Altona North | Stony Creek | Spotswood |

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

## Flood Mitigation Systems

Flood mitigation has predominantly been developed in the form of 2 Retarding Basins and 7 Levees. 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 |
|---|---|---|---|---|---|---|---|---|---|
| Cherry Lake | Cherry's Main Drain | 99.8 ha | 940 ML | 1.2m AHD | Unavailable | 0.6m | Low | Unavailable | 54 J8 |
| Truganina Swamp | Laverton Main Drain | 147.6 ha | 1057 ML | N/A | Unavailable | 1.1m | Very Low | 0 | 54 B11 |

Table A2 – Melbourne Water Retarding Basins within the City of Hobsons Bay

| Hobsons Bay City Council Retarding Basin | Location | Area | Melway Reference |
|---|---|---|---|
| Drainage Reserve | 6-8 Dunnings Road, Seabrook | 0.22 ha | 208 A4 |
| Garnsworthy Place Reserve | 105-121 John Listen Drive, Newport | 0.25 ha | 55 K5 |
| Paisley Park Golf Course Lakes | Paisley Park, Altona | 47.35 ha | 55 D4 |
| Private Property | Off Link Court, Brooklyn | 0.35 ha | 41 C10 |

Table A3 – Hobsons Bay City Council Retarding Basins

## Levees

| Levee | Reach | Side | Levee Height | Levee Length | Expected Level of Protection | ANCOLD Hazard Rating | Consequences of Failure | Melway Reference |
|---|---|---|---|---|---|---|---|---|
| Kororoit Creek, Altona | West of Millers Road | South | 1.7m (4.40m AHD) | 0.8km | 1% AEP flood level with 900mm freeboard | Very Low | Floodwaters flow into Cherry Lake and possibly across Millers Road | 55 E8 - 55 C7 |
| Kororoit Creek, Altona | East of Millers Road | South | 1.7m (3.55m AHD) | 0.6km | 1% AEP flood level with 500mm freeboard | Significant | 37 residential properties flooded along Waters Drive | 55 A8 - 55 B8 |
| Kororoit Creek Floodwall, Seaholme | Waters Drive to Cherry's Drain | South | 1.1m | 0.6km | Unavailable | High A | 77 residential properties flooded along Waters and Simmons Drives | 55 B9 |
| Kororoit Creek, Altona | Darbyshire Street to Petroleum Refinery | North | 3.2m (2.70m AHD) | 0.8km | 1% AEP flood level with unknown freeboard | Significant | 9 large industrial lots flooded along Seaview Pde and Techno Park Drive | 55 C7 - 55 F7 |
| Kororoit Creek, Altona | Petroleum Refinery to Paisley Drain | North | 1.0m (1.10m AHD) | 0.4km | Unavailable | Low | 5 industrial lots flooded along Gray Reserve Road | 55 F8 - 55 E8 |
| Truganina Swamp, Altona | Park Parade to Lark Street | South | 1.5m (2.86m AHD) | 1.4km | 1% AEP flood level with approx. 1.0m freeboard | High C | 53 residential properties flooded along Purnell St and Bell Ave | 54 C10 - 54 C9 |
| Truganina Swamp, Altona | Lark Street to Queen Street | South | 1.4m (2.86m AHD) | 0.5km | 1% AEP flood level with approx. 1.0m freeboard | High A | 76 residential properties including the Port Phillip Retirement Village along Grant Ave, Stewart Ave and Bell Ave | 54 C10 - 54 C12 |

Table A4 – Levees within the City of Hobsons Bay

## Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located within the City of Hobsons Bay is contained within the following two tables. To view their locations, view mapping in **Appendix F**.

### Sewer Emergency Relief Points

| On Drain / Waterway | Bank / Side of Waterway | Location | Melway Reference |
|---|---|---|---|
| Kororoit Creek | West | Between Princes Highway and the West Gate Freeway, 120m north of Freeway bridge | 40 G11 |
| Laverton Main Drain | South | Charlesworth Street, Laverton | 53 E8 |
| Mulga Ave M.D. | | Manning Street between Myrtle Grove and Queen Street, Altona | 54 D12 |
| Nellie Street M.D. | | Civic Parade and Seves Street, Altona | 54 J10 |
| Yarra River | West | Riverside Park north of the Scienceworks Jetty | 56 B1 |

Table A5 – Sewer Emergency Relief Points within or close to the City of Hobsons Bay

## Flood Warning System

Within the City of Hobsons Bay, there are 3 hydrographic monitoring sites within the Municipality. These are outlined in the table below. There are also monitors upstream on Kororoit Creek at Brooklyn and Deer Park; and Skeleton Creek at Hoppers Crossing. 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**.

| Hydrographic Monitoring Station | Station No. | Location | Owner | Gauge Type | Melway Ref |
|---|---|---|---|---|---|
| Altona | 587047 | City West Water Western No.2 Waste Purification Plant on Queen Street | Melbourne Water | Rain | 53 H12 |
| Stony Creek at Spotswood | 230112A | South side of the creek, west of Williamstown Road bridge | Melbourne Water | Stream Level & Rain | 41 J11 |
| Williamstown | 230118A | Royal Yacht Club of Victoria, Nelson Place | Port of Melbourne | Tide Level | 56 E9 |

Table A6 – Hydrographic Monitoring Stations within the City of Hobsons Bay

Other gauges located in adjoining Municipalities that may assist in flood warning for the Kororoit and Skeleton Creeks are outlined below. To view their locations, see mapping in **Appendix F**.

| Hydrographic Monitoring Station | Station No. | Location | Owner | Gauge Type | Melway Ref |
|---|---|---|---|---|---|
| Kororoit Creek at Diggers Rest | 231106A | West bank of the creek, north side of Holden Road | Melbourne Water | Stream Level & Rain | 332 H8 |
| Kororoit Creek at Rockbank | 231105B | North bank of the creek, east side of Leakes Road | Melbourne Water | Stream Level & Rain | 344 J1 |
| Kororoit Creek at Deer Park | 231104A | North side of the creek along Millbank Drive, near Wandsworth Ave | Melbourne Water | Stream Level & Rain | 25 C7 |
| Kororoit Creek at Brooklyn | 231107A | West bank of the creek, north side of the Federation Bicycle Trail bridge | Melbourne Water | Stream Level & Rain | 40 G10 |
| Laverton RAAF AWS | 87031 | RAAF Williams Laverton Base, off Roland Road | Bureau of Meteorology | Rain | 53 A8 |
| Skeleton Creek at Hoppers Crossing | 231110A | East side of the creek, south side of Sayers Road bridge | Melbourne Water | Stream Level & Rain | 203 A6 |

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

Melbourne Water has assigned Flood Class Levels for the Deer Park gauge along Kororoit Creek.

| Hydrographic Monitoring Station | River / Creek Flood Class Level (m) | | |
|---|---|---|---|
| | Minor | Moderate | Major |
| Kororoit Creek at Deer Park | 3.6m | 4.0m | 4.5m |

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

At this site along Kororoit Creek, 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 Hobsons Bay monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

The Bureau does not issue formal flood warnings for Stony or Skeleton Creeks. For Stony Creek, this is due to its rapid response to rainfall because of the urban surrounds which quickly direct stormwater into drains and waterways. This results in rapid stream rises during thunderstorms and heavy rainfall creating a short lead time for response.

## Historical Floods

Significant floods (with high flood gauge levels and likely flooding consequences to property and infrastructure) to have occurred within the City of Hobsons Bay are as follows in the table below. Click the hyperlink on the event date where available for a radar loop of the storm.

| Event | Kororoit Creek at Deer Park (231104A) | | Kororoit Creek at Brooklyn (231107A) | | Stony Creek at Spotswood (230112A) | | Altona (587047) | Skeleton Creek at Hoppers Crossing (231110A) | |
|---|---|---|---|---|---|---|---|---|---|
| | Rainfall at Gauge | Creek Height | Rainfall at Gauge | Creek Height | Rainfall at Gauge | Creek Height | Rainfall at Gauge | Rainfall at Gauge | Creek Height |
| Normal Water Level | - | 0.75m | - | 0.22m | - | 0.13m | - | - | 1.17m |
| **Minor Flood Class** | | 3.6m | | | | | | | |
| **Moderate Flood Class** | | 4.0m | | | | | | | |
| **Major Flood Class** | | 4.5m | | | | | | | |
| 7th March 1919 | - | - | - | **5.67m** | - | - | - | - | - |
| 27th February 1946 | - | - | - | 1.46m | - | 2.72m | - | - | - |
| April 1950 | - | - | - | 2.15m | - | - | - | - | - |
| 29th January 1963 | - | - | - | 3.77m | - | - | - | - | - |
| 15th May 1974 | - | - | - | 3.66m | - | - | - | - | - |
| 7th April 1977 | - | - | - | 4.12m | - | **2.74m** | - | - | - |
| 15th October 1983 | 98mm / 33 hrs | 4.90m | 88mm / 33 hrs | 4.02m | - | - | - | 86mm / 32 hrs | 2.55m |
| 10th December 1985 | 36mm / 30 hrs | 3.88m | 29mm / 32 hrs | 2.46m | - | - | - | 23mm / 33 hrs | 2.43m |
| 29th July 1987 | 74mm / 32 hrs | 3.57m | 60mm / 32 hrs | 1.56m | - | - | - | 60mm / 30 hrs | 2.51m |
| 15th September 1993 | 72mm / 28 hrs | - | 60mm / 29 hrs | 2.24m | - | - | 56mm / 26 hrs | 30mm / 14 hrs | 2.54m |
| 22nd March 2001 | 91mm / 11 hrs | 2.57m | 92mm / 11 hrs | 2.82m | 74mm / 11 hrs | 2.50m | 103mm / 11 hrs | 54mm / 11 hrs | 1.47m |
| 3rd February 2005 | **170mm / 31 hrs** | **5.32m** | 135mm / 31 hrs | 4.01m | 148mm / 30 hrs | 1.80m | 119mm / 31 hrs | **130mm / 31 hrs** | **3.47m** |
| 14th December 2008 | 87mm / 42 hrs | 2.37m | 66mm / 40 hrs | 1.53m | 79mm / 42 hrs | 1.19m | 77mm / 39 hrs | 105mm / 40 hrs | 2.56m |
| 14 November 2010 | 54mm / 23 hrs | 3.43m | 47mm / 23 hrs | 2.31m | 50mm / 22 hrs | 1.33m | 48mm / 24 hrs | 51mm / 23 hrs | 2.34m |
| 26th November 2010 | 32mm / 29 hrs | 3.20m | 24mm / 29 hrs | 2.16m | 28mm / 30 hrs | 1.09m | 24mm / 29 hrs | 41mm / 22 hrs | 2.75m |
| 14th January 2011 | 85mm / 73 hrs | 3.25m | 92mm / 73 hrs | 2.15m | 78mm / 73 hrs | 1.53m | 91mm / 72 hrs | 87mm / 72 hrs | 2.74m |
| 5th February 2011 | 49mm / 32 hrs | 2.17m | 87mm / 32 hrs | 1.61m | 90mm / 32 hrs | 2.22m | **139mm / 32 hrs** | 113mm / 31 hrs | 3.30m |
| 25th December 2011 | 42mm / 5 hrs | 2.43m | 39mm / 5 hrs | 1.89m | 39mm / 5 hrs | 2.08m | 35mm / 5 hrs | 38mm / 4 hrs | 2.45m |
| 25th May 2012 | 34mm / 11 hrs | 1.81m | 40mm / 11 hrs | 1.45m | 33mm / 11 hrs | 1.96m | 47mm / 12 hrs | 50mm / 13 hrs | 2.21m |

| Event | Kororoit Creek at Deer Park (231104A) | | Kororoit Creek at Brooklyn (231107A) | | Stony Creek at Spotswood (230112A) | | Altona (587047) | Skeleton Creek at Hoppers Crossing (231110A) | |
|---|---|---|---|---|---|---|---|---|---|
| | Rainfall at Gauge | Creek Height | Rainfall at Gauge | Creek Height | Rainfall at Gauge | Creek Height | Rainfall at Gauge | Rainfall at Gauge | Creek Height |
| Normal Water Level | - | 0.75m | - | 0.22m | - | 0.13m | - | - | 1.17m |
| **Minor Flood Class** | | 3.6m | | | | | | | |
| **Moderate Flood Class** | | 4.0m | | | | | | | |
| **Major Flood Class** | | 4.5m | | | | | | | |
| 18th August 2012 | 27mm / 15 hrs | 3.04m | 6mm / 15 hrs | 2.14m | 4mm / 16 hrs | 0.68m | 6mm / 14 hrs | 32mm / 16 hrs | 2.90m |
| 2nd December 2017 | - | 1.74m | 60mm / 41 hrs | 1.42m | 65mm / 39 hrs | 1.41m | - | 43mm / 38 hrs | 2.20m |
| 30th January 2018 | 43mm / 8 hrs | 2.04m | 45mm / 8 hrs | 1.59m | 42mm / 8 hrs | 1.78m | 41mm / 10 hrs | 48mm / 10 hrs | 2.44m |
| 6th November 2018 | 30mm / 2 hrs | 2.52m | 30mm / 2 hrs | 1.78m | 27mm / 2 hrs | 2.09m | 18mm / 3 hrs | 18mm / 3 hrs | 2.22m |
| 13th December 2018 | - | - | 44mm / 7 hrs | 1.53m | 40mm / 7 hrs | 1.68m | - | 32mm / 7 hrs | 2.42m |
| 14th December 2018 | - | - | 10mm / 1 hr | 1.25m | 25mm / 1 hr | 1.90m | - | 11mm / 1 hr | 2.13m |

Table A9 – Selection of Historical Flood Events along Kororoit Creek, Stony Creek and Skeleton Creek

## February 2005 Event

Kororoit Creek upstream of Kororoit Creek Road


Melway Ref: 54-J-3 (looking south)

Kororoit Creek upstream of railway


Melway Ref: 54-J-3 (looking south)

Kororoit Creek at Port Phillip Bay


Melway Ref: 55-D-8 (looking south west)

Laverton Creek Truganina Swamp


Melway Ref: 53-K-12 (looking north)

Laverton Creek & Kayes Drain


Melway Ref: 53-H-10 (looking north)

Skelton Creek Sanctuary Lakes Development


Melway Ref: 208-D-3 (looking south west)

## Dam Failure

No dams, either in or upstream of the City of Hobsons Bay are expected to affect the Municipality from flooding. See Dam Failure in Section 3 of this plan for more information. A number of Service Reservoirs are located within the Municipality however and are listed below.

| Melbourne Water Service Reservoir | Location | Owner | Material | Reservoir Capacity | Melway Reference |
|---|---|---|---|---|---|
| City West Water No.1 | Western No.2 Waste Purification Plant, Queen Street, Altona | City West Water | Unavailable | Unavailable | 53 J12 |
| City West Water No.2 | Western No.2 Waste Purification Plant, Queen Street, Altona | City West Water | Unavailable | Unavailable | 53 J12 |
| City West Water No.3 | Western No.2 Waste Purification Plant, Queen Street, Altona | City West Water | Unavailable | Unavailable | 53 J12 |

Table A10 – Service Reservoirs in the City of Hobsons Bay

# 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 (eg. 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 |
|---|---|---|---|
| **KORORROIT CREEK** | | | |
| Diggers Rest | Brooklyn | Between 1 hour to 10 hours | Inflows from tributaries likely to impact on travel times. |
| Deer Park | | Between 1 min to 4 hours | Inflows from tributaries likely to impact on travel times. |

Table B1 – Typical Flood Travel Times between gauges on Kororoit Creek

## Historical Travel Times

| Flood Event | Location From (gauge) | Location To (gauge) | Flood Peak Travel Time | Flood Class at |
|---|---|---|---|---|
| **KORORROIT CREEK** | | | | **Deer Park** |
| 15th October1983 | Diggers Rest | Deer Park | 6 hours | Major |
| 10th December 1985 | Diggers Rest | Brooklyn | 6 hours | Minor |
| | Deer Park | | 3 hours | |
| 29th July 1987 | Diggers Rest | Brooklyn | 1 hour | Below Minor |
| | Deer Park | | Less than 1 hour | |
| 15th September 1993 | Diggers Rest | Brooklyn | Less than 1 hour | Moderate |
| 6th November 1995 | Diggers Rest | Brooklyn | 10 hours | Below Minor |
| | Deer Park | | 3 hours | |
| 3rd February 2005 | Diggers Rest | Brooklyn | 3 hours | Major |
| | Deer Park | | 1 hour | |
| 14 November 2010 | Diggers Rest | Brooklyn | 9 hours | Below Minor |
| | Deer Park | | 3 hours | |
| 28 November 2010 | Diggers Rest | Brooklyn | 4 hours | Below Minor |
| | Deer Park | | 2 hours | |
| 14th January 2011 | Diggers Rest | Brooklyn | 9 hours | Below Minor |
| | Deer Park | | 3 hours | |
| 5th February 2011 | Diggers Rest | Brooklyn | 13 hours | Below Minor |
| | Deer Park | | 4 hours | |
| 25th December 2011 | Deer Park | Brooklyn | 1 hour | Below Minor |
| 25th May 2012 | Deer Park | Brooklyn | Less than 1 hour | Below Minor |
| 18th August 2012 | Diggers Rest | Brooklyn | 10 hours | Below Minor |
| | Deer Park | | 3 hours | |

Table B2 – Historical Flood Travel Times between gauges on Kororoit Creek

# APPENDIX C1 – KORORROIT CREEK & STORMWATER TRIBUTARIES FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

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

| Summary of Consequences in a 1% AEP (100yr ARI) flood along Kororoit Creek | | | | | |
|---|---|---|---|---|---|
| **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 | Racecourse Road | Police Stations | 0 | |
| Major Rail | 1 | Werribee Railway Line via Altona | Government Buildings | 0 | |
| Bus Routes | 0 | | Sewerage Facilities | 1 | Emergency Relief Point |
| Power Facility | 0 | | Levees | 5 | West of Millers Road to Maddox Street |
| Comms Services | 0 | | Drainage Facilities | 0 | |
| Emergency Services | 0 | | Airports / Airfields | 0 | |
| **Tourism / Recreation** | | | | | |
| Sports Facilities | 0 | | Caravan Parks | 0 | |
| Recreation Facilities | 1 | Kororoit Creek Trail | Camping Grounds | 0 | |
| **Government Boundaries** | | | | | |
| Local Gov't Areas | 1 | Hobsons Bay | CMA | 1 | Port Phillip & Westernport |
| Adjacent LGAs | 2 | Brimbank and Wyndham | CFA District | 0 | |
| SES Unit Area | 1 | Hobsons Bay | MFB District | 1 | Western |

Table C1.1 – Consequence Summary of 1% AEP flood along Kororoit Creek

Brooklyn, Altona North, Altona & Williamstown North are located approximately 12km southwest of Melbourne in a mixed residential and industrial area. Kororoit Creek is the prominent watercourse in the area, flowing from the north through the Municipalities of Melton and Brimbank. High Intensity, short duration rainfall events can cause flash flooding in and around the stormwater drains that

connect to Kororoit Creek, while prolonged rainfall may see Kororoit Creek flood. See mapping in **Appendix F** for more insight into flooding in the area.

## Warning Times

Warnings are available for flooding expected along Kororoit Creek at Deer Park. 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.

| Hydrographic Monitoring Station | Station No. | Location | Owner | Gauge Type | Melway Ref |
|---|---|---|---|---|---|
| Kororoit Creek at Diggers Rest | 231106A | West bank of the creek, north side of Holden Road | Melbourne Water | Stream Level & Rain | 332 H8 |
| Kororoit Creek at Rockbank | 231105B | North bank of the creek, east side of Leakes Road | Melbourne Water | Stream Level & Rain | 344 J1 |
| Kororoit Creek at Deer Park | 231104A | North side of the creek along Millbank Drive, near Wandsworth Ave | Melbourne Water | Stream Level & Rain | 25 C7 |
| Kororoit Creek at Brooklyn | 231107A | West bank of the creek, north side of the Federation Bicycle Trail bridge | Melbourne Water | Stream Level & Rain | 40 G10 |

Table C1.2 – Hydrographic Monitoring Stations within the Kororoit 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 www.emergency.vic.gov.au for any thunderstorm, flood or severe weather warnings present for their area.

## Areas of Flood Risk

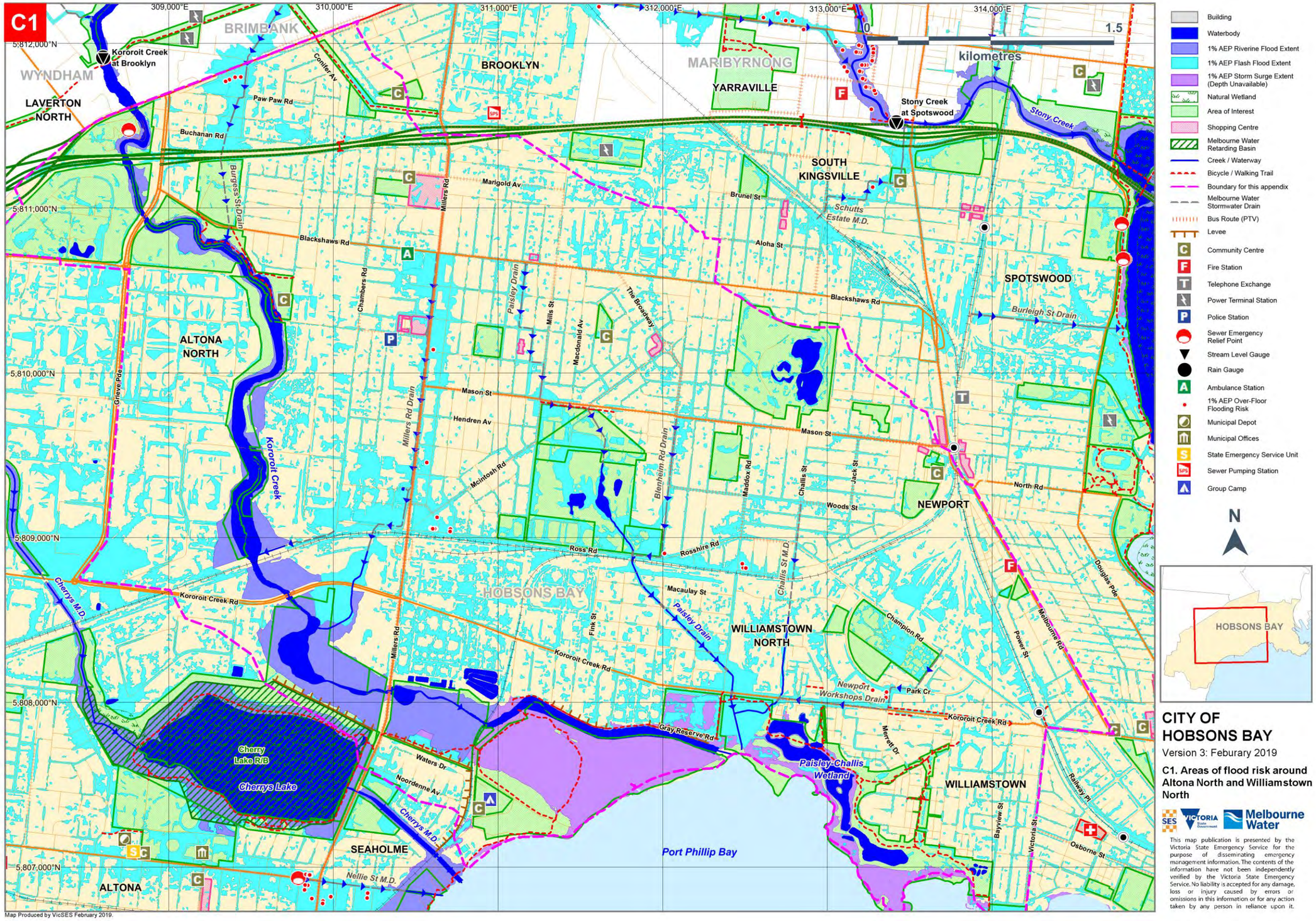


Figure C1 – Areas of flood risk around Kororoit Creek and its tributaries in the City of Hobsons Bay

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Kororoit Creek 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 Kororoit Creek Lower (Melbourne Water, May 2011) flood mapping and risk assessment program. *This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.*

| Properties at risk from Flooding during a 1% AEP event along Kororoit Creek | | | | |
|---|---|---|---|---|
| Residential | Commercial | Industrial | Rural | Public Use |

| Street No. at Risk | Street | Suburb | Along Melbourne Water Watercourse | Flood Risk Type |
|---|---|---|---|---|
| - | | | | |

| Total |
|---|
| 0 |

Table C1.3 – Properties at risk of flooding along Kororoit Creek in the City of Hobsons Bay

Properties listed in the table below are at risk from flooding over-floor along Kororoit Creek's stormwater tributaries in Altona North and Williamstown North. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Millers Road Drain (CMPS&F, April 1998) and the Paisley Drain (CMPS&F, April 1998) 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 Kororoit Creek's stormwater tributaries in Hobsons Bay | | | | | | |
|---|---|---|---|---|---|---|
| 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 | | | | |
| ✓ | ✓ | ✓ | 1A Bryan Avenue | Altona North | Millers Road Drain | Flash |
| | | ✓ | 1B Bryan Avenue | Altona North | Millers Road Drain | Flash |
| ✓ | ✓ | ✓ | 1/94 Maddox Road | Newport | Paisley Drain | Flash |
| ✓ | ✓ | ✓ | 2/94 Maddox Road | Newport | Paisley Drain | Flash |
| | ✓ | ✓ | 143 McIntosh Road | Altona North | Millers Road Drain | Flash |
| | ✓ | ✓ | 221 Millers Road | Altona North | Millers Road Drain | Flash |
| | ✓ | ✓ | 1 Myrtle Street | Williamstown North | Newport Workshops Drain | Flash |
| | ✓ | ✓ | 3 Myrtle Street | Williamstown North | Newport Workshops Drain | Flash |
| | ✓ | ✓ | 5 Myrtle Street | Williamstown North | Newport Workshops Drain | Flash |
| | | ✓ | 83 Park Cres | Williamstown North | Newport Workshops Drain | Flash |
| | | ✓ | 91 Park Cres | Williamstown North | Newport Workshops Drain | Flash |
| | | ✓ | 14 Railway Parade | Newport | Challis Street Main Drain | Flash |
| ✓ | ✓ | ✓ | 15 Railway Parade | Newport | Challis Street Main Drain | Flash |
| ✓ | ✓ | ✓ | 13 Ross Road | Altona North | Millers Road Drain | Flash |
| ✓ | ✓ | ✓ | 15 Ross Road | Altona North | Millers Road Drain | Flash |

| Properties at risk from Flooding over-floor along Kororoit Creek's stormwater tributaries in Hobsons Bay | | | | | | |
|---|---|---|---|---|---|---|
| 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 | | | | |
| ✓ | ✓ | ✓ | 17A Ross Road | Altona North | Millers Road Drain | Flash |
| ✓ | ✓ | ✓ | 19 Ross Road | Altona North | Millers Road Drain | Flash |
| ✓ | ✓ | ✓ | 21 Ross Road | Altona North | Millers Road Drain | Flash |
| ✓ | ✓ | ✓ | 23 Ross Road | Altona North | Millers Road Drain | Flash |
| | | ✓ | 44 Rosshire Road | Newport | Blenheim Road Drain | Flash |
| ✓ | ✓ | ✓ | 31 Seventh Avenue | Altona North | Millers Road Drain | Flash |
| Totals | | | | | | |
| 11 | 16 | 21 | | | | |

Table C1.4 – Properties at risk of flooding along Kororoit Creek's stormwater Tributaries in the City of Hobsons Bay

## Isolation

No major isolation risks exist for areas around areas surrounding Kororoit Creek in Brooklyn, Altona North, Altona or Williamstown North during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

## Essential Infrastructure

- **Werribee Railway Line** via Altona at risk of inundation at Kororoit Creek crossing during a 10% AEP event on Kororoit Creek

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 Hobsons Bay is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/21_Hobsons_Bay_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Brooklyn, Altona North, Altona or Williamstown 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 Brooklyn, Altona North, Altona or Williamstown North. Check the VicRoads website for more details: https://traffic.vicroads.vic.gov.au/

| VicRoads Roads flooded in a 1% AEP (100yr ARI) event |
|---|
| • Kororoit Creek Road, Williamstown North at Maddox Road and west of Millers Road, Altona North |
| • Princes Highway (Geelong Road), Brooklyn at Burgess Street |

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

| Hobsons Bay City Council Roads affected in a 1% AEP (100yr ARI) event | | | |
|---|---|---|---|
| **ALTONA** | • Duke Street | **BROOKLYN** | **WILLIAMSTOWN** |
| • Racecourse Road | • Lloyd Street | • Buchanan Road | • Techno Park Drive |
| **ALTONA NORTH** | • Mason Street | • Burgess Street | **WILLIAMSTOWN NORTH** |
| • Challis Street | • Ross Road | • Clelland Road | • Maddox Road |
| • Chambers Road | • Walker Close | • Paw Paw Road | |

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

## Flood Mitigation

### Retarding Basins

| Hobsons Bay City Council Retarding Basin | Location | Area | Melway Reference |
|---|---|---|---|
| Paisley Park Golf Course Lakes | Paisley Park, Altona | 47.35 ha | 55 D4 |

Table C1.7 – Hobsons Bay City Council Retarding Basins around Kororoit Creek at its Tributaries

## Levees

| Levee | Reach | Side | Levee Height | Levee Length | Expected Level of Protection | ANCOLD Hazard Rating | Consequences of Failure | Melway Reference |
|---|---|---|---|---|---|---|---|---|
| Kororoit Creek, Altona | West of Millers Road | South | 1.7m (4.40m AHD) | 0.8km | 1% AEP flood level with 900mm freeboard | Very Low | Floodwaters flow into Cherry Lake and possibly across Millers Road | 55 E8 - 55 C7 |
| Kororoit Creek, Altona | East of Millers Road | South | 1.7m (3.55m AHD) | 0.6km | 1% AEP flood level with 500mm freeboard | Significant | 37 residential properties flooded along Waters Drive | 55 A8 - 55 B8 |
| Kororoit Creek Floodwall, Seaholme | Waters Drive to Cherry's Drain | South | 1.1m | 0.6km | Unavailable | High A | 77 residential properties flooded along Waters and Simmons Drives | 55 B9 |
| Kororoit Creek, Altona | Darbyshire Street to Petroleum Refinery | North | 3.2m (2.70m AHD) | 0.8km | 1% AEP flood level with unknown freeboard | Significant | 9 large industrial lots flooded along Seaview Pde and Techno Park Drive | 55 C7 - 55 F7 |
| Kororoit Creek, Altona | Petroleum Refinery to Paisley Drain | North | 1.0m (1.10m AHD) | 0.4km | Unavailable | Low | 5 industrial lots flooded along Gray Reserve Road | 55 F8 - 55 E8 |

Table C1.8 – Melbourne Water Levees in the Kororoit Catchment in the City of Hobsons Bay

## Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located along Kororoit Creek near the City of Hobsons Bay is contained within the following table.

### Sewer Emergency Relief Points

| On Drain / Waterway | Bank / Side of Waterway | Location | Melway Reference |
|---|---|---|---|
| Kororoit Creek | West | Between Princes Highway and the West Gate Freeway, 120m north of Freeway bridge | 40 G11 |

Table C1.9 – Sewer Emergency Relief Points along Kororoit Creek near the City of Hobsons Bay

## Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. 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 Kororoit Creek and its stormwater tributaries at various creek heights or rain totals within the City of Hobsons Bay. 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:

- Brooklyn Gauge, Kororoit Creek
- Kororoit Creek Stormwater Tributaries, Altona North and Williamstown

# FLOOD INTELLIGENCE CARD – BROOKLYN GAUGE, KORORoit CREEK

**Version 3 – February 2019**

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

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| | |
|---|---|
| LOCATION | **West bank of the creek, north side of the Federation Bicycle Trail bridge** |
| MELWAY REFERENCE: | **40 G10** |
| STREAM: | **Kororoit Creek** |
| GAUGE NUMBER: | **231107A** |
| GAUGE ZERO: | **7.567m AHD** |
| GAUGE TYPE | **Stream Level & Rain** |

| | |
|---|---|
| MINOR: | **Not Established** |
| MODERATE: | **Not Established** |
| MAJOR | **Not Established** |
| LEVEE HEIGHTS: | **5.33m to 6.23m** |
| TELEMETRIC/MANUAL | **Telemetric** |
| HIGHEST RECORDED FLOOD: | **5.67m (7th March 1919)** |

| Creek Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 3.57m | 20% AEP (5yr ARI) Flood Level | **Water Over Road (over 300mm depth)**<br>• Racecourse Road, Altona flooded at Kororoit Creek crossing | |
| 3.86m | 10% AEP (10yr ARI) Flood Level | **Essential Infrastructure at Risk**<br>• Werribee Railway Line via Altona likely flooded at Kororoit Creek crossing | VICSES will provide warnings using EM-COP to Hobson's Bay Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES Region Duty Officer, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident<br><br>VICSES to respond on a request by request basis.<br><br>Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements |

| Creek Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| | | | |
| 4.01m | February 2005 Flood Level | **Event Summary**<br>• Racecourse Road, Altona flooded at Kororoit Creek crossing<br>• Werribee Railway Line via Altona flooded at Kororoit Creek crossing<br>• Disused trestle bridge between Barnes Road and Geelong Railway Line flooded | |
| 4.33m | 5% AEP (20yr ARI) Flood Level | **Community Infrastructure Flooded**<br>• Kororoit Creek Trail flooded at various locations<br>**Water Over Road (over 300mm depth)**<br>• Disused trestle bridge between Barnes Road and Geelong Railway Line flooded | |
| 4.90m | 2% AEP (50yr ARI) Flood Level | | |
| 5.33m | 1% AEP (100yr ARI) Flood Level | **Essential Infrastructure Likely Impacted**<br>• Levees along Kororoit Creek around Millers Road and the Petroleum Refinery approaching Crest Level minus their specific freeboards | |

Table C1.10 – Breakdown of likely consequences at various Brooklyn gauge level heights along Kororoit Creek with operational considerations

# FLOOD INTELLIGENCE CARD – MILLERS ROAD & PAISLEY DRAINS, ALTONA NORTH (UNGAUGED)

**Version 3 – February 2019**

*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 | **Kororoit Creek at Brooklyn** |
| LOCATION | **West bank of the creek, north side of the Federation Bicycle Trail bridge** |
| MELWAY REF: | **40 G10** |

| | |
|---|---|
| GAUGE NUMBER | **231107A** |
| GAUGE TYPE | **Stream Level & Rain** |
| TELEMETRIC/MANUAL | **Telemetric** |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 16mm in 10 mins;<br>26mm in 30 mins;<br>33mm in 1 hour;<br>42mm in 2 hours;<br>47mm in 3 hours; or<br>59mm in 6 hours<br><br>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)**<br>**11 Properties in Total**<br>**Millers Road Drain**<br>• 1A Bryan Avenue, Altona North<br>• 13, 15, 17A, 19, 21 & 23 Ross Road, Altona North<br>• 31 Seventh Avenue, Altona North<br>**Paisley Drain**<br>• 1/94 & 2/94 Maddox Road, Williamstown<br>• 15 Railway Parade, Newport<br>**Community Infrastructure Flooded**<br>**Paisley Drain**<br>• Altona Lakes Public Golf Course flooded in parts<br>**Water Over Road**<br>**Millers Road Drain**<br>• Millers Road, Altona North at points between Blackshaws Road and Railway bridge overpass<br>• Ross Road, Altona North west of Millers Road<br>**Paisley Drain**<br>• Mason Street, Altona North at Mills Street<br>• Ross Road, Altona North at Altona Miniature Railway | VICSES will provide warnings using VicEmergency to Hobson's Bay Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.<br><br>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident<br><br>VICSES to respond on a request by request basis.<br><br>Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 20mm in 10 mins; 32mm in 30 mins; 41mm in 1 hour; 51mm in 2 hours; 58mm in 3 hours; or 73mm in 6 hours<br><br>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)**<br>**16 Properties in Total**<br>**Millers Road Drain**<br>• 1A Bryan Avenue, Altona North<br>• 143 McIntosh Road, Altona North<br>• 221 Millers Road, Altona North<br>• 13, 15, 17A, 19, 21 & 23 Ross Road, Altona North<br>• 31 Seventh Avenue, Altona North<br>**Paisley Drain**<br>• 1/94, 2/94 & 124 Maddox Road, Newport<br>• 1, 3 & 5 Myrtle Street, Williamstown North<br>• 15 Railway Parade, Newport<br>**Community Infrastructure Flooded**<br>**Millers Road Drain**<br>• Altona Gate Kindergarten, Walker Close, Altona North may experience minor property flooding<br>**Water Over Road**<br>**Millers Road Drain**<br>• Walker Close, Altona North<br>• Ross Road, Altona North west of Millers Road<br>• Chambers Road, Altona North near Ross Road<br>**Paisley Drain**<br>• Mason Street, Altona North at Mills Street<br>• Ross Road, Altona North at Altona Miniature Railway<br>• Lloyd Street, Altona North<br>• Maddox Road, Williamstown North at Kororoit Creek Road<br>• Kororoit Creek Road, Williamstown North at Maddox Road | |
| 23mm in 10 mins; 37mm in 30 mins; 48mm in 1 hour; 60mm in 2 hours; 68mm in 3 hours; or 85mm in 6 hours<br><br>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of | 1% AEP (100 year ARI) | **Properties at Flood Risk (Over-Floor)**<br>**21 Properties in Total**<br>**Millers Road Drain**<br>• 1A & 1B Bryan Avenue, Altona North<br>• 143 McIntosh Road, Altona North<br>• 221 Millers Road, Altona North<br>• 13, 15, 17A, 19, 21 & 23 Ross Road, Altona North<br>• 31 Seventh Avenue, Altona North<br>**Paisley Drain**<br>• 1/94 & 2/94 Maddox Road, Williamstown<br>• 1, 3 & 5 Myrtle Street, Williamstown<br>• 83 & 91 Park Crescent, Williamstown | |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| the catchment. This should be used as a guide only. | | • 14 & 15 Railway Parade, Newport<br>• 44 Rosshire Road, Newport<br>**Community Infrastructure Flooded**<br>**Millers Road Drain**<br>• Altona Gate Kindergarten, Millers Road, Altona North may experience minor property flooding<br>• Altona North Primary School, Cresser Street, Altona North may experience minor property flooding<br>**Paisley Drain**<br>• Altona Lakes Public Golf Course inundated in parts<br>• The Kororoit Creek and Brunswick City Anglers Clubs may experience some property flooding<br>• Altona Miniature Railway on Blenheim Road, Newport<br>**Water Over Road (over 300mm depth)**<br>**Millers Road Drain**<br>• Walker Close, Altona North<br>• Duke Street, Altona North<br>• Ross Road, Altona North west of Millers Road<br>• Chambers Road, Altona North near Ross Road<br>• Kororoit Creek Road, Altona North, floodwaters level with road<br>**Paisley Drain**<br>• Mason Street, Altona North at Mills Street<br>• Ross Road, Altona North at Altona Miniature Railway<br>• Lloyd Street, Altona North<br>• Challis Street, Altona North at Market Street<br>• Maddox Road, Williamstown North at Kororoit Creek Road<br>• Kororoit Creek Road, Williamstown North at Maddox Road | |

Table C1.11 – Breakdown of possible consequences at various rainfall intensities around Altona North and Williamstown North with operational considerations

# APPENDIX C2 – STONY CREEK FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

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

| Summary of Consequences in a 1% AEP (100yr ARI) flood along Stony Creek and its stormwater tributaries | | | | | |
|---|---|---|---|---|---|
| **Property** | | | | | |
| **Properties** | **9** | | | | |
| Residential | 1 | | | | |
| Commercial | 0 | | | | |
| Industrial | 8 | | | | |
| 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 | 5 | Blackshaws Road; Douglas Pde; Melbourne Road; Westgate Fwy city bound on-ramp at Williamstown Rd; and Williamstown Rd | Police Stations | 0 | |
| Major Rail | 0 | | Government Buildings | 0 | |
| Bus Routes | 4 | 232; 432; 472; & 944 | Sewerage Facilities | 1 | Emergency Relief Point |
| Power Facility | 0 | | Levees | 0 | |
| Comms Services | 0 | | Drainage Facilities | 1 | HBCC Retarding Basin |
| 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 | Hobsons Bay | CMA | 1 | Port Phillip & Westernport |
| Adjacent LGAs | 2 | Brimbank & Maribyrnong | CFA District | 0 | |
| SES Unit Area | 1 | Hobsons Bay | MFB District | 1 | Western |

Table C2.1 – Consequence Summary of 1% AEP flood along Stony Creek and its stormwater tributaries

The Stony Creek catchment in the City of Hobsons Bay and the adjoining suburbs of Brooklyn, Spotswood & South Kingsville are located approximately 5km west of Melbourne in a mixed residential and industrial area. Stony Creek is the prominent watercourse in the area, flowing from

the northwest through the Municipalities of Brimbank and Maribyrnong. Two large stormwater drains connect to Stony Creek in or near the City of Hobsons Bay: the Francis Street and Schutts Estate Main Drains. High Intensity, short duration rainfall events can cause flash flooding in and around these stormwater drains, while prolonged rainfall may see Stony Creek flood. See mapping in **Appendix F** for more insight into flooding in the area.

## Warning Times

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for Stony Creek. All flood response actions must therefore be driven by rainfall and / or river level observations. A telemetered water level / flood gauge is located at Spotswood within the Stony Creek catchment.

| Hydrographic Monitoring Station | Station No. | Location | Owner | Gauge Type | Melway Ref |
|---|---|---|---|---|---|
| Stony Creek at Spotswood | 230112A | South side of the creek, west of Williamstown Road bridge | Melbourne Water | Stream Level & Rain | 53 H12 |

Table C2.2 – Hydrographic Monitoring Stations within the Stony 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

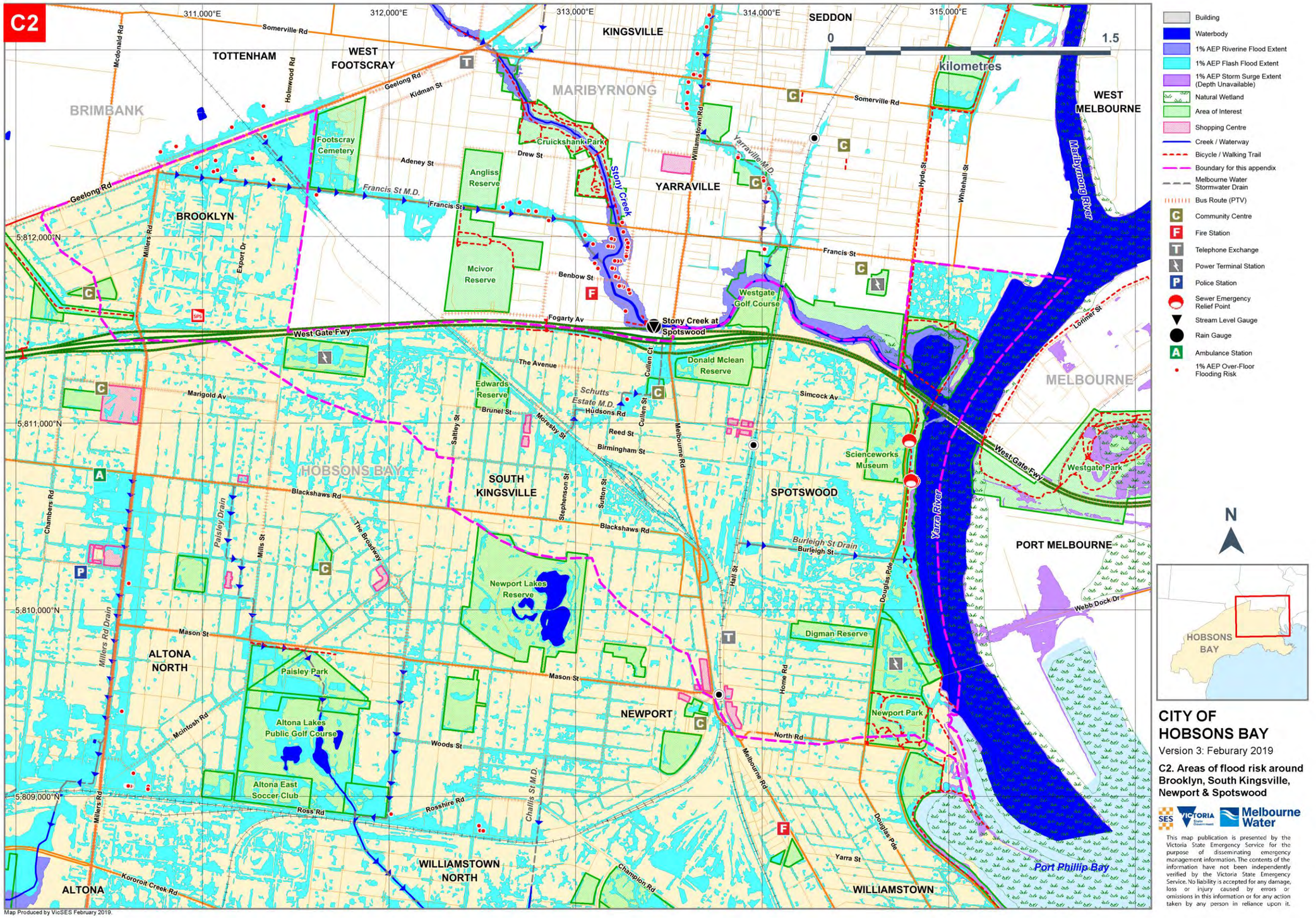


Figure C2 – Areas of flood risk around Stony Creek in the City of Hobsons Bay

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Stony Creek in the City of Hobsons Bay. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Stony Creek (Water Technology, May 2013) flood mapping and risk assessment program. *This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.*

| Properties at risk from Flooding along Stony Creek in Hobsons Bay during a 1% AEP event | | | | |
|---|---|---|---|---|
| Residential | Commercial | Industrial | Rural | Public Use |

| Street No. at Risk | Street | Suburb | Along Melbourne Water Watercourse | Flood Risk Type |
|---|---|---|---|---|
| - | | | | |

| Total |
|---|
| 0 |

Table C2.3 – Properties at risk of flooding along Stony Creek in the City of Hobsons Bay

Properties listed in the table below are at risk from flooding over-floor around Stony Creek's stormwater tributaries. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Francis Street Main Drain (Water Technology, May 2013) and the Schutts Estate Main Drain (Water Technology, May 2013) flood mapping and risk assessment programs. Note that any multi-lot properties situated above ground floor likely impacted by isolation only with flooding on ground floor impacting access to common areas and/or carpark and storage facilities. Information on above ground-floor properties is not available in this list.

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

| Properties at risk from Flooding over-floor along Stony Creek's stormwater tributaries in Hobsons Bay | | | | | | | |
|---|---|---|---|---|---|---|---|
| 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 | | | | |
| | | ✓ | 410-422 Francis Street | Brooklyn | Francis Street Main Drain | Flash |
| ✓ | ✓ | ✓ | 424-430 Francis Street | Brooklyn | Francis Street Main Drain | Flash |
| | ✓ | ✓ | 432 Francis Street | Brooklyn | Francis Street Main Drain | Flash |
| ✓ | ✓ | ✓ | 434 Francis Street | Brooklyn | Francis Street Main Drain | Flash |
| ✓ | ✓ | ✓ | 521 Geelong Road | Brooklyn | Francis Street Main Drain | Flash |
| | | ✓ | 525 Geelong Road | Brooklyn | Francis Street Main Drain | Flash |
| | ✓ | ✓ | 531-533 Geelong Road | Brooklyn | Francis Street Main Drain | Flash |
| | ✓ | ✓ | 535 Geelong Road | Brooklyn | Francis Street Main Drain | Flash |
| | ✓ | ✓ | 27 Mary Street | Spotswood | Schutts Estate Main Drain | Flash |

| Totals | | |
|---|---|---|
| 3 | 7 | 9 |

Table C2.4 – Properties at risk of flooding within the Stony Creek catchment in the City of Hobsons Bay

## Isolation

No major isolation risks exist for areas around Spotswood, Brooklyn & South Kingsville 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 Hobsons Bay is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/21_Hobsons_Bay_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Spotswood, Brooklyn & South Kingsville 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 Spotswood, Brooklyn & South Kingsville. Check the VicRoads website for more details: https://traffic.vicroads.vic.gov.au/

| VicRoads Roads flooded in a 1% AEP (100yr ARI) event |
|---|
| • Blackshaws Road, Newport at Melbourne Road underpass |
| • Douglas Parade, Spotswood at Scienceworks Museum |
| • Melbourne Road, Newport at Mason Street |
| • Westgate Freeway city-bound on-ramp at Williamstown Road |
| • Williamstown Road, Spotswood at the Westgate Freeway underpass |

Table C2.4 – VicRoads possible road closures during a flooding event

| Hobsons Bay City Council Roads flooded in a 1% AEP (100yr ARI) event | |
|---|---|
| **BROOKLYN** | **SPOTSWOOD** |
| • Hardie Road | • Burleigh Street |
| **SOUTH KINGSVILLE** | • Cullen Court |
| • Moresby Street | • Hudsons Road |
| • Stephenson Street | • The Avenue |

Table C2.5 – Hobsons Bay City Council possible road closures during a flooding event

## Flood Mitigation

### Retarding Basins

| Hobsons Bay City Council Retarding Basin | Location | Area | Melway Reference |
|---|---|---|---|
| Private Property | Off Link Court, Brooklyn | 0.35 ha | 41 C10 |

Table C2.5 – Hobsons Bay City Council Retarding Basins within the Stony Creek catchment

## Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Spotswood, Brooklyn & South Kingsville is contained within the following table.

### Sewer Emergency Relief Points

| On Drain / Waterway | Bank / Side of Waterway | Location | Melway Reference |
|---|---|---|---|
| Yarra River (near Stony Creek mouth) | West | Riverside Park north of the Scienceworks Jetty | 56 B1 |

Table C2.6 – Sewer Emergency Relief Points in the Stony Creek Catchment in the City of Hobsons Bay

## Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. . 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 Stony Creek and its stormwater tributaries at various creek heights or rain totals within Hobsons Bay. 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:

- Stony Creek at Spotswood
- Stony Creek's stormwater tributaries in Brooklyn, Spotswood and South Kingsville

# FLOOD INTELLIGENCE CARD – SPOTSWOOD GAUGE, STONY CREEK

**Version 3 – February 2019**

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

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

| | |
|---|---|
| LOCATION | **South side of the creek, west of Williamstown Road bridge** |
| MELWAY REFERENCE: | **41 J11** |
| STREAM: | **Stony Creek** |
| GAUGE NUMBER: | **230112A** |
| GAUGE ZERO: | **0.82m 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: | **2.74m (7th April 1977)** |

| Creek Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 2.9m | 20% AEP (5yr ARI) Flood Level | • Nil expected in Hobsons Bay | |
| 3.1m | 10% AEP (10yr ARI) Flood Level | • Nil expected in Hobsons Bay | |
| 3.32m | 5% AEP (20yr ARI) Flood Level | • Nil expected in Hobsons Bay | |
| 3.58m | 2% AEP (50yr ARI) Flood Level | • Nil expected in Hobsons Bay | |
| 4.62m | 1% AEP (100yr ARI) Flood Level | **Water Over Road (over 300mm depth)**<br>• Westgate Freeway city-bound on-ramp at Williamstown Road, Spotswood | VICSES will provide warnings using VicEmergency to Hobson's Bay Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.<br><br>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident |

| Creek Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| | | | VICSES to respond on a request by request basis.<br><br>Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements |

Table C2.7 – Breakdown of likely consequences at various Spotswood gauge level heights along Stony Creek in Hobsons Bay with operational considerations

# FLOOD INTELLIGENCE CARD – STONY CREEK'S STORMWATER TRIBUTARIES (UNGAUGED)

**Version 3 – February 2019**

*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 | **Stony Creek at Spotswood** |
| LOCATION | **South side of the creek, west of Williamstown Road bridge** |
| MELWAY REF: | **41 J11** |

| | |
|---|---|
| GAUGE NUMBER | **230112A** |
| GAUGE TYPE | **Stream Level & Rain** |
| TELEMETRIC/MANUAL | **Telemetric** |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 11mm in 10 mins;<br>18mm in 30 mins;<br>23mm in 1 hour;<br>29mm in 2 hours;<br>33mm in 3 hours; or<br>42mm in 6 hours<br><br>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only. | 20% AEP (5 year ARI) | • Nil Expected in Hobsons Bay | |
| 13mm in 10 mins;<br>22mm in 30 mins;<br>28mm in 1 hour;<br>35mm in 2 hours;<br>40mm in 3 hours; or<br>50mm in 6 hours | 10% AEP (10 year ARI) | **Properties at Flood Risk (Over-Floor)**<br>**3 Properties in Total**<br>**Francis Street Main Drain**<br>• 424-430 & 434 Francis Street, Brooklyn<br>• 521 Geelong Road, Brooklyn<br>**Water Over Road (over 300mm depth)**<br>**Schutts Estate Main Drain**<br>• Hudsons Road, Spotswood | VICSES will provide warnings using VicEmergency to Hobson's Bay Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.<br><br>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 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. | | • Cullen Court, Spotswood<br>• The Avenue, Spotswood | awareness and form an appropriate response arrangement to suit the level of incident<br><br>VICSES to respond on a request by request basis.<br><br>Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements |
| 16mm in 10 mins;<br>26mm in 30 mins;<br>33mm in 1 hour;<br>42mm in 2 hours;<br>47mm in 3 hours; or<br>59mm in 6 hours<br><br>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)**<br>**7 Properties in Total**<br>**Francis Street Main Drain**<br>• 424-430, 432 & 434 Francis Street, Brooklyn<br>• 521, 531-533 & 535 Geelong Road, Brooklyn<br>**Schutts Estate Main Drain**<br>• 27 Mary Street, Spotswood<br>**Water Over Road (over 300mm depth)**<br>**Schutts Estate Main Drain**<br>• Moresby Street, South Kingsville<br>• Stephenson Street, South Kingsville near Morseby Street<br>• Hudsons Road, Spotswood<br>• Cullen Court, Spotswood<br>• Williamstown Road, Spotswood at the Westgate Freeway underpass | |
| 20mm in 10 mins;<br>32mm in 30 mins;<br>41mm in 1 hour;<br>51mm in 2 hours;<br>58mm in 3 hours; or<br>73mm in 6 hours<br><br>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)**<br>**8 Properties in Total**<br>**Francis Street Main Drain**<br>• 424-430, 432 & 434 Francis Street, Brooklyn<br>• 521, 525, 531-533 & 535 Geelong Road, Brooklyn<br>**Schutts Estate Main Drain**<br>• 27 Mary Street, Spotswood<br>**Water Over Road (over 300mm depth)**<br>**Francis Street Main Drain**<br>• Hardie Road, Brooklyn<br>**Schutts Estate Main Drain**<br>• Moresby Street, South Kingsville<br>• Stephenson Street, South Kingsville near Morseby Street<br>• Hudsons Road, Spotswood<br>• Cullen Court, Spotswood<br>• Williamstown Road, Spotswood at the Westgate Freeway underpass | |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 23mm in 10 mins;<br>37mm in 30 mins;<br>48mm in 1 hour;<br>59mm in 2 hours;<br>67mm in 3 hours; or<br>84mm in 6 hours<br><br>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)**<br>**9 Properties in Total**<br>**Francis Street Main Drain**<br>• 410-422, 424-430, 432 & 434 Francis Street, Brooklyn<br>• 521, 525, 531-533 & 535 Geelong Road, Brooklyn<br>**Schutts Estate Main Drain**<br>• 27 Mary Street, Spotswood<br>**Water Over Road (over 300mm depth)**<br>**Francis Street Main Drain**<br>• Hardie Road, Brooklyn<br>**Schutts Estate Main Drain**<br>• Moresby Street, South Kingsville<br>• Stephenson Street, South Kingsville near Morseby Street<br>• Hudsons Road, Spotswood<br>• Cullen Court, Spotswood<br>• Williamstown Road, Spotswood at the Westgate Freeway underpass | |

Table C2.8 – Breakdown of possible consequences at various rainfall intensities around Brooklyn, Spotswood and South Kingsville with operational considerations

# APPENDIX C3 – ALTONA & SEAHOLME FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

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

| Summary of Consequences in a 1% AEP (100yr ARI) flood in Altona and Seaholme | | | | | |
|---|---|---|---|---|---|
| **Property** | | | | | |
| **Properties** | **450** | | | | |
| Residential | 437 | | | | |
| Commercial | 13 | | | | |
| 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 | 3 | Civic Parade; Grieve Pde; Kororoit Creek Rd | Police Stations | 0 | |
| Major Rail | 0 | | Government Buildings | 0 | |
| Bus Routes | 5 | 411, 412, 415, 903 & 944 | Sewerage Facilities | 2 | Emergency Relief Points |
| Power Facility | 0 | | Levees | 1 | Sea Wall |
| Comms Services | 0 | | Drainage Facilities | 1 | Cheery Lake Retarding Basin |
| 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 | Hobsons Bay | CMA | 1 | Port Phillip & Westernport |
| Adjacent LGAs | 1 | Wyndham | CFA District | 0 | |
| SES Unit Area | 1 | Hobsons Bay | MFB District | 1 | Western |

Table C3.1 – Consequence Summary of 1% AEP flood in Altona and Seaholme

Altona & Seaholme are located approximately 13km south-west of Melbourne in a predominantly residential area. The area is bordered by the Laverton and Kororoit Creeks flowing from the west and north respectively before draining into Port Phillip Bay.

Altona & Seaholme are coastal suburbs situated along a stretch of relatively flat terrain. As such, the area directly adjacent to the Bay is susceptible to Storm Surge flooding during high intensity rainfall events. A flood wall is in development along this stretch of coastline.

High Intensity, short duration rainfall events can also cause flash flooding in and around the area because of the flat terrain. See mapping in **Appendix F** for more insight into flooding in the area.

Please note there are minor differences between Melbourne Water's surge flood mapping and the City of Hobsons Bay's data.

## Warning Times

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for the Laverton Main Drain, Cherrys Main Drain or for Port Phillip Bay Storm Surge. All flood response actions must therefore be driven by rainfall / stream or tide level observations. Telemetered gauges are located at Altona, Laverton and Williamstown.

| Hydrographic Monitoring Station | Station No. | Location | Owner | Gauge Type | Melway Ref |
|---|---|---|---|---|---|
| Altona | 587047 | City West Water Western No.2 Waste Purification Plant on Queen Street | Melbourne Water | Rain | 53 H12 |
| Laverton RAAF AWS | 87031 | RAAF Williams Laverton Base, off Roland Road | Bureau of Meteorology | Rain | 53 A8 |
| Williamstown | 230118A | Royal Yacht Club of Victoria, Nelson Place | Port of Melbourne | Tide Level | 56 E9 |

Table C3.1 – Hydrographic Monitoring Stations around Altona

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.

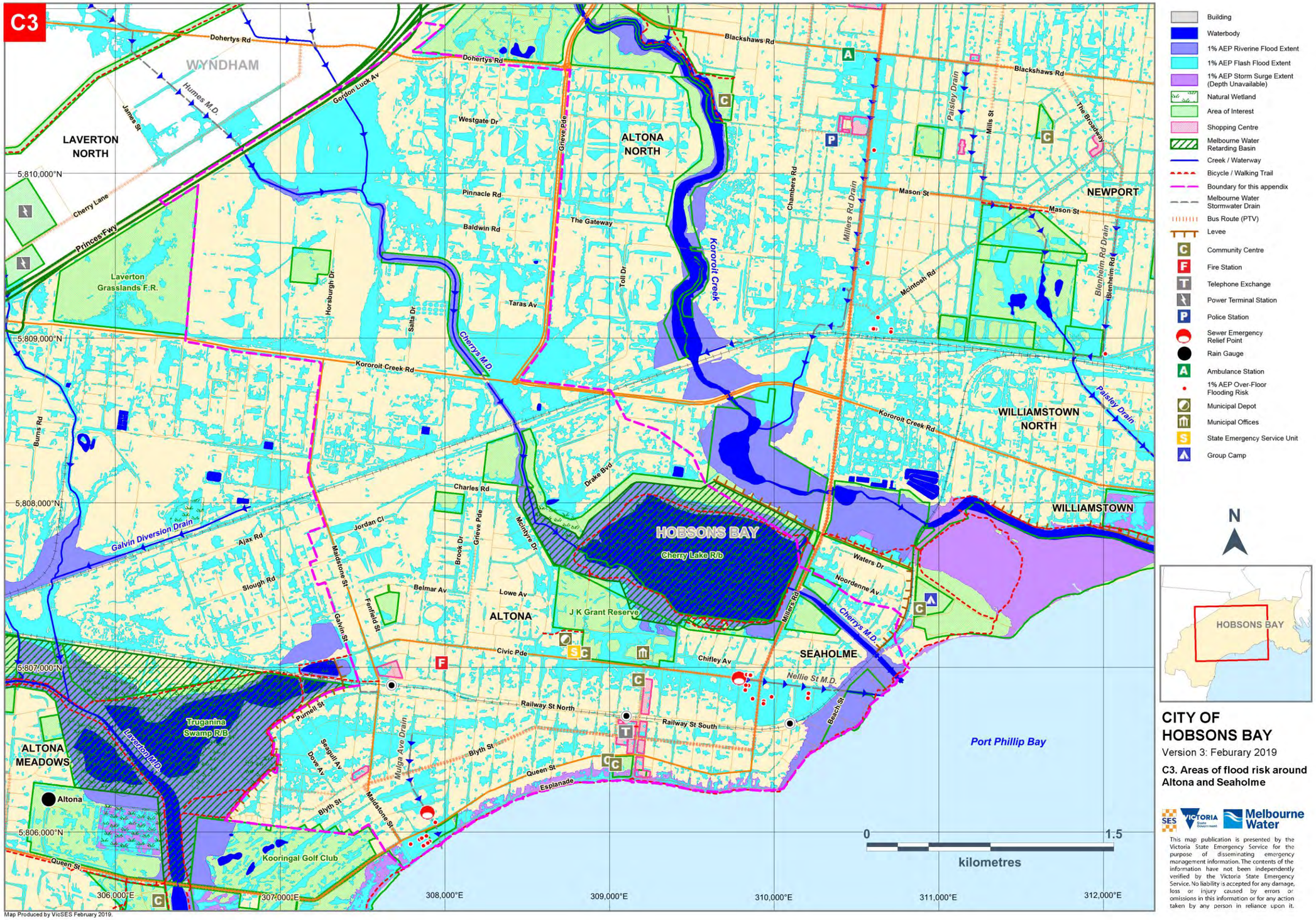


Figure C3 – Areas of flood risk around Altona & Seaholme in the City of Hobsons Bay

## Properties at Flood Risk

Properties listed in the table below are at risk from flash flooding around Altona and Seaholme. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Hobsons Bay (Cardno, 2017), the Nellie St Main Drain (CMPS&F, 1998) and the Mulga Avenue Drain (CMPS&F, 1998) 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 Flash 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 |
|---|---|---|---|---|
| 49 | Bayview Street | Altona | Nelle Street Main Drain | Flash |
| 51 | Bayview Street | Altona | Nelle Street Main Drain | Flash |
| 25 | Central Avenue | Seaholme | Nelle Street Main Drain | Flash |
| 27 | Central Avenue | Seaholme | Nelle Street Main Drain | Flash |
| 29 | Central Avenue | Seaholme | Nelle Street Main Drain | Flash |
| 31 | Central Avenue | Seaholme | Nelle Street Main Drain | Flash |
| 33 | Central Avenue | Seaholme | Nelle Street Main Drain | Flash |
| 35 | Central Avenue | Seaholme | Nelle Street Main Drain | Flash |
| 1 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 3 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 4 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 5 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 6 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 7 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 8 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 9 | Chorley Avenue | Altona | Cherrys Main Drain | Flash |
| 37A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 38 | Civic Parade | Seaholme | Nelle Street Main Drain | Flash |
| 1/39 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 40 | Civic Parade | Seaholme | Nelle Street Main Drain | Flash |
| 41A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/42 | Civic Parade | Seaholme | Nelle Street Main Drain | Flash |
| 2/42 | Civic Parade | Seaholme | Nelle Street Main Drain | Flash |
| 3/42 | Civic Parade | Seaholme | Nelle Street Main Drain | Flash |
| 43A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 44 | Civic Parade | Seaholme | Nelle Street Main Drain | Flash |
| 45A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 51 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 53 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 55 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 56 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 57 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 58 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 59 | Civic Parade | Altona | Nelle Street Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 60 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 61 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 62 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 62A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 63 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 64 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 65 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/66 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/66 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 3/66 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 67 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/68 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/68 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 69 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 70 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 71 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/72 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/72 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 3/72 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 4/72 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 5/72 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 6/72 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 73 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 75 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 76 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 77 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 78 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 79 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/80 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/80 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 81 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 82 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 83 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/84 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/84 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 3/84 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 4/84 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 85 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/86 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/86 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 87 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 88 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 89 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 90 | Civic Parade | Altona | Nelle Street Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 91 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 92 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 93 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 94 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 95 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 96 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 97 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 98 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 99 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 100 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 101 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 102 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 103 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 104 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 105 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/106 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/106 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 107 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 108 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 109 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 110 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 111 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 112 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 114 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 130 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 132 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/134 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/134 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 136 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 138 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 140 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 142A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 144 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 144A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 146 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 1/148 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 2/148 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 3/148 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 156 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 157 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 158 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 159 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 160 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 161 | Civic Parade | Altona | Nelle Street Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 162 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 162B | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 163 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 164 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 165 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 166 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 167 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 168 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 169 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 170 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 171 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 172 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 173 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 175 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 177 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 179B | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 181A | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 181B | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 183 | Civic Parade | Altona | Nelle Street Main Drain | Flash |
| 27 | Curlew Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 29 | Curlew Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 30 | Curlew Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 32 | Curlew Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 34 | Curlew Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 62 | David Street | Altona | Nelle Street Main Drain | Flash |
| 64 | David Street | Altona | Nelle Street Main Drain | Flash |
| 69 | David Street | Altona | Nelle Street Main Drain | Flash |
| 71 | David Street | Altona | Nelle Street Main Drain | Flash |
| 73 | David Street | Altona | Nelle Street Main Drain | Flash |
| 56 | Davies Street | Altona | Nelle Street Main Drain | Flash |
| 19B | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 21A | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 21 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 23 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 29 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 1/31 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 2/31 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 3/31 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 33 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 1/35 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 2/35 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 36 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 37 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 38 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 40 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 42 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 44 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 46 | Dove Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 1 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 3 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 5A | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 5 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 7 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 8 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 9 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 10 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 11 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 12 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 13 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 14 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 16 | Emu Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 345 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 347 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 349 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 351 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 353 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 355 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 357 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 359 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 361 | Esplanade | Altona | Mulga Avenue Main Drain | Flash |
| 1 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 3 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 4 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 5 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 6 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 7 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 8 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 10 | Frazer Avenue | Altona | Cherrys Main Drain | Flash |
| 2A | Fresno Street | Altona | Nelle Street Main Drain | Flash |
| 1/6 | Galvin Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/6 | Galvin Street | Altona | Mulga Avenue Main Drain | Flash |
| 8 | Galvin Street | Altona | Mulga Avenue Main Drain | Flash |
| 10 | Galvin Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/38 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 2/38 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 3/38 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 40 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 53 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 1/55 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 2/55 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 57 | Grieve Parade | Altona | Mulga Avenue Main Drain | Flash |
| 16 | Harrington Street | Altona | Mulga Avenue Main Drain | Flash |
| 26 | Harrington Square | Altona | Mulga Avenue Main Drain | Flash |
| 27 | Harrington Square | Altona | Mulga Avenue Main Drain | Flash |
| 28 | Harrington Square | Altona | Mulga Avenue Main Drain | Flash |
| 29 | Harrington Square | Altona | Mulga Avenue Main Drain | Flash |
| 30 | Harrington Square | Altona | Mulga Avenue Main Drain | Flash |
| 31 | Harrington Square | Altona | Mulga Avenue Main Drain | Flash |
| 1 | Kim Court | Altona | Cherrys Main Drain | Flash |
| 2 | Kim Court | Altona | Cherrys Main Drain | Flash |
| 3 | Kim Court | Altona | Cherrys Main Drain | Flash |
| 4 | Kim Court | Altona | Cherrys Main Drain | Flash |
| 9 | Kim Court | Altona | Cherrys Main Drain | Flash |
| 10 | Kim Court | Altona | Cherrys Main Drain | Flash |
| 1 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 3 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 5 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 7 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 9 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 11 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 13 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 16 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 18 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 20 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 22 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 24 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 26 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 28 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/35 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 37 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 38 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 51 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 54 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 56 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 76 | Linnet Street | Altona | Mulga Avenue Main Drain | Flash |
| 2 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 2A | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 73 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 75 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/77 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/77 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 82 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 84 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/86 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/86 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 3/86 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 116 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 120 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 122 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 124 | Maidstone Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/61 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 2/61 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 3/61 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 4/61 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 63 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 66 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 68 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 70 | Mcbain Street | Altona | Nelle Street Main Drain | Flash |
| 35 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 37 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 54 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 55 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 56 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 57 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 58 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 59 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 61 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 74 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 76 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 78 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 80 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 82 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 84 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 86 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 88 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 90 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 92 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 94 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 96 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 98 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 100 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 102 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 104 | Mcintyre Drive | Altona | Cherrys Main Drain | Flash |
| 18A | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 1/20 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 2/20 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 22 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 24 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 26 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 28 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 30 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 32 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 32A | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 1/34 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 2/34 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 35 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 36 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 37 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 38 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 39 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 40 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 41 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 1/43 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 2/43 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 3/43 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 1/45 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 2/45 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 3/45 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 47 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 49 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 51 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 1/53 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 2/53 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 55 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 57 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 58A | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 59 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 60 | Millers Road | Seaholme | Nelle Street Main Drain | Flash |
| 61 | Millers Road | Altona | Nelle Street Main Drain | Flash |
| 49 | Mount Street | Altona | Nelle Street Main Drain | Flash |
| 51 | Mount Street | Altona | Nelle Street Main Drain | Flash |
| 15 | Mulga Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/17 | Mulga Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/17 | Mulga Street | Altona | Mulga Avenue Main Drain | Flash |
| 3/17 | Mulga Street | Altona | Mulga Avenue Main Drain | Flash |
| 19 | Mulga Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/123 | Pier Street | Altona | Nelle Street Main Drain | Flash |
| 2/123 | Pier Street | Altona | Nelle Street Main Drain | Flash |
| 3/123 | Pier Street | Altona | Nelle Street Main Drain | Flash |
| 125 | Pier Street | Altona | Nelle Street Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 240 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/242 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/242 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 243 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 244 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 246 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 248 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 250 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 252 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 256 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 258 | Queen Street | Altona | Mulga Avenue Main Drain | Flash |
| 10 | Ransom Avenue | Altona | Cherrys Main Drain | Flash |
| 12 | Ransom Avenue | Altona | Cherrys Main Drain | Flash |
| 1/29 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/29 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 3/29 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 4/29 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/31 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/31 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 3/31 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 4/31 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 5/31 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 52A | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 52 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/54 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/54 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 3/54 | Rayner Street | Altona | Mulga Avenue Main Drain | Flash |
| 1 | Robin Street | Altona | Mulga Avenue Main Drain | Flash |
| 70 | Romawi Street | Altona | Nelle Street Main Drain | Flash |
| 37A | Rose Street | Altona | Mulga Avenue Main Drain | Flash |
| 37 | Rose Street | Altona | Mulga Avenue Main Drain | Flash |
| 39 | Rose Street | Altona | Mulga Avenue Main Drain | Flash |
| 60A | Sargood Street | Altona | Nelle Street Main Drain | Flash |
| 60 | Sargood Street | Altona | Nelle Street Main Drain | Flash |
| 62 | Sargood Street | Altona | Nelle Street Main Drain | Flash |
| 65 | Sargood Street | Altona | Nelle Street Main Drain | Flash |
| 67 | Sargood Street | Altona | Nelle Street Main Drain | Flash |
| 1/14 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 1/14 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 16 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 18 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 20 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 22 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 24 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 26 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 28 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 33 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 35 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 37 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 39 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 41 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 43 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 45 | Seagull Avenue | Altona | Mulga Avenue Main Drain | Flash |
| 1/28 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 2/28 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 30 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 1/32 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 2/32 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 34 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 35 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 36 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 37 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 38 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 39 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 40 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 41 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 1/42 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 2/42 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 43 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 44 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 45 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 46 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 47 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 48 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 50 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 52 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 53 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 54 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 55 | Seves Street | Altona | Nelle Street Main Drain | Flash |
| 20 | Stanley Street | Altona | Mulga Avenue Main Drain | Flash |
| 22 | Stanley Street | Altona | Mulga Avenue Main Drain | Flash |
| 1/23 | Stanley Street | Altona | Mulga Avenue Main Drain | Flash |
| 2/23 | Stanley Street | Altona | Mulga Avenue Main Drain | Flash |
| 3/23 | Stanley Street | Altona | Mulga Avenue Main Drain | Flash |
| 2A | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 1/2 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 2/2 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 4 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |

| Properties at risk from Flash 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 |
|---|---|---|---|---|
| 1/6 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 2/6 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 7 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 8 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 9 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 10 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 11 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 12 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 13 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 14 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 15 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 1/16 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 2/16 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 17 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 18 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 19 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 20 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 21 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 23 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |
| 25 | Waratah Street | Seaholme | Nelle Street Main Drain | Flash |

| Total |
|---|
| 450 |

Table C3.3 – Properties at risk of flooding in Altona and Seaholme in the City of Hobsons Bay

Properties listed in the table below are at risk from storm surge flooding along the Port Phillip Bay coastline during a 1% AEP storm surge event. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Port Phillip Bay Coastal Inundation (Cardno, 2015) 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 Storm Surge 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 |
|---|---|---|---|---|
| 1 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 2 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 3 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 4 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 5 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 1/6 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 2/6 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 3/6 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 8 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 10 | Acacia Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 1 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 3 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 5 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 7 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 9A | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 9 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 10 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 11 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 13 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 15 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 17 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 19A | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 19 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 21 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 23A | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 23B | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 23C | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 25 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 27 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 27A | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 29A | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 29 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 31 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 33 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 35 | Beach Street | Seaholme | Port Phillip Bay | Storm Surge |
| 1 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |

| Properties at risk from Storm Surge 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 |
|---|---|---|---|---|
| 1/3 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 2/3 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 3/3 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 1/5 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 2/5 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 3/5 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 7 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 9 | Central Avenue | Seaholme | Port Phillip Bay | Storm Surge |
| 2-4 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 6 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 8 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 10A | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 10 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 1/12 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 2/12 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 14 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 16 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 18 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 20 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 22 | Civic Parade | Seaholme | Port Phillip Bay | Storm Surge |
| 4 | Correa Street | Altona | Port Phillip Bay | Storm Surge |
| 5 | Correa Street | Altona | Port Phillip Bay | Storm Surge |
| 7 | Correa Street | Altona | Port Phillip Bay | Storm Surge |
| 9 | Correa Street | Altona | Port Phillip Bay | Storm Surge |
| 1-3 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 5 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 5A | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 7 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 9 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 11 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 13 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 15 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 17 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 21 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 25 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 27 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 29 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 35 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 47 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 49 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 51 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 61 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 63-71 | Esplanade | Seaholme | Port Phillip Bay | Storm Surge |
| 73 | Esplanade | Altona | Port Phillip Bay | Storm Surge |

| Properties at risk from Storm Surge 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 |
|---|---|---|---|---|
| 75 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 77 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 79 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 85 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 87 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 91 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 93 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 95 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/97 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/97 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/97 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 103B | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 103 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 107 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 123 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 125-129 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 131 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 133 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 141-153 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 155-173 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 175 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/175 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/175 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/175 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 5/175 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 179 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 181 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 185 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 187 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 187A | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 189 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 193 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 195 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 197 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 199 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 201 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 203 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 205 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 207 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 209 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 211 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 213 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 215 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 217 | Esplanade | Altona | Port Phillip Bay | Storm Surge |

| Properties at risk from Storm Surge 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 |
|---|---|---|---|---|
| 219 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/221 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/221 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/221 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/221 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 5/221 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 6/221 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 223 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 225 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/227 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/227 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 229 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 231A | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 231 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/233 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/233 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/233 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/235 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/235 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/237 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/237 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/237 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/237 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 5/237 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/239 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 243 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 5/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 6/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 7/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 8/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 9/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 10/245 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/247 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/247 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 249 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 251 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |

| Properties at risk from Storm Surge 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 |
|---|---|---|---|---|
| 5/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 6/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 7/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 8/253 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 255 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/259 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/259 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/259 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/259 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 5/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 6/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 7/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 8/261 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 263B | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 263A | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 263 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 265 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 267 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 269 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 271-273 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 275 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 277 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 345 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 347 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 349 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 351 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 353 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 355 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 357 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 359 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 365 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 367 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 2/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 3/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 4/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 5/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 6/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 7/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 8/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |

| Properties at risk from Storm Surge 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 |
|---|---|---|---|---|
| 9/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 10/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 11/369 | Esplanade | Altona | Port Phillip Bay | Storm Surge |
| 1A | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 1 | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 2A | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 2B | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 2 | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 2C | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 3 | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 3A | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 4 | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 5A | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 5 | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 7 | Garden Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 1 | Maidstone Street | Altona | Port Phillip Bay | Storm Surge |
| 2A | Maidstone Street | Altona | Port Phillip Bay | Storm Surge |
| 2 | Maidstone Street | Altona | Port Phillip Bay | Storm Surge |
| 6 | Mcbain Street | Altona | Port Phillip Bay | Storm Surge |
| 1 | Millers Road | Altona | Port Phillip Bay | Storm Surge |
| 1 | Queen Street | Seaholme | Port Phillip Bay | Storm Surge |
| 3 | Queen Street | Seaholme | Port Phillip Bay | Storm Surge |
| 52 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 128 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 3/206 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 4/206 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 3/208 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 4/208 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 210 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 220 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 240 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 1/242 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 2/242 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 244 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 246 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 248 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 250 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 252 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 256 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 258 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 260 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 262 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 264 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 266 | Queen Street | Altona | Port Phillip Bay | Storm Surge |

| Properties at risk from Storm Surge 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 |
|---|---|---|---|---|
| 268 | Queen Street | Altona | Port Phillip Bay | Storm Surge |
| 1/1 | Sargood Street | Altona | Port Phillip Bay | Storm Surge |
| 2/1 | Sargood Street | Altona | Port Phillip Bay | Storm Surge |
| 3/1 | Sargood Street | Altona | Port Phillip Bay | Storm Surge |
| 2 | Sargood Street | Altona | Port Phillip Bay | Storm Surge |
| 3 | Sarros Street | Altona | Port Phillip Bay | Storm Surge |
| 1/8 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 2/8 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 3/8 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 4/8 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 5/8 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 10 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 12 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 14 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 16 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 18 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 20 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 22 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 24 | Station Street | Seaholme | Port Phillip Bay | Storm Surge |
| 4 | Wattle Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 6 | Wattle Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 8 | Wattle Grove | Seaholme | Port Phillip Bay | Storm Surge |
| 2 | Webb Street | Altona | Port Phillip Bay | Storm Surge |

| Total |
|---|
| 279 |

Table C3.4 – Properties at risk of storm surge flooding along the Port Phillip Bay Coastline in the City of Hobsons Bay

## Isolation

No major isolation risks exist for areas around Altona & Seaholme 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 Hobsons Bay is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/21_Hobsons_Bay_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Altona & Seaholme 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 Altona & Seaholme. Check the VicRoads website for more details: https://traffic.vicroads.vic.gov.au/

| VicRoads Roads flooded in a 1% AEP (100yr ARI) event |
|---|
| • Civic Parade, Altona between Millers Road and Grieve Parade |
| • Grieve Parade, Altona North at Kororoit Creek Road |
| • Kororoit Creek Road, Altona at Cherry Creek |

Table C3.5 – VicRoads Possible Road Closures during a flooding event

| Hobsons Bay City Council Roads flooded in a 1% AEP (100yr ARI) event | |
|---|---|
| **ALTONA** | **ALTONA NORTH** |
| • Dove Avenue | • Taras Avenue |
| • Esplanade | **SEAHOLME** |
| • Linnet Street | • Acacia Avenue |
| • McIntyre Drive | • Central Avenue |
| • Millers Road (south of Civic Pde) | • Civic Parade (east of Millers Rd) |
| • Robin Street | • Waratah Street |
| • Seagull Avenue | • Wattle Grove |
| • Seves Street | |
| • Stanley Street | |

Table C3.6 – Hobsons Bay 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 |
|---|---|---|---|---|---|---|---|---|---|
| Cherry Lake | Cherry's Main Drain | 99.8 ha | 940 ML | 1.2m AHD | Unavailable | 0.6m | Low | Unavailable | 54 J8 |
| Truganina Swamp | Laverton Main Drain | 147.6 ha | 1057 ML | N/A | Unavailable | 1.1m | Very Low | 0 | 54 B11 |

Table C3.6 – Melbourne Water Retarding Basins around Altona & Seaholme in the City of Hobsons Bay

## LEVEES

| Melbourne Water Levees | Reach | Side | Levee Height | Levee Length | Expected Level of Protection | ANCOLD Hazard Rating | Consequences of Failure | Melway Reference |
|---|---|---|---|---|---|---|---|---|
| Kororoit Creek Floodwall, Seaholme | Waters Drive to Cherry's Drain | South | 1.1m | 0.6km | Unavailable | High A | 77 residential properties flooded along Waters and Simmons Drives | 55 B9 |
| Truganina Swamp, Altona | Park Parade to Lark Street | South | 1.5m (2.86m AHD) | 1.4km | 1% AEP flood level with approx. 1.0m freeboard | High C | 53 residential properties flooded along Purnell St and Bell Ave | 54 C10 - 54 C9 |
| Truganina Swamp, Altona | Lark Street to Queen Street | South | 1.4m (2.86m AHD) | 0.5km | 1% AEP flood level with approx. 1.0m freeboard | High A | 76 residential properties including the Port Phillip Retirement Village along Grant Ave, Stewart Ave and Bell Ave | 54 C10 - 54 C12 |

Table C3.7 – Melbourne Water Levees around Altona & Seaholme in the City of Hobsons Bay

## Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Altona and Seaholme is contained within the following two tables.

### Sewer Emergency Relief Points

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

| On Drain / Waterway | Owner | Location | Melway Reference |
|---|---|---|---|
| Mulga Ave M.D. | City West Water | Manning Street between Myrtle Grove and Queen Street, Altona | 54 D12 |
| Nellie Street M.D. | City West Water | Civic Parade and Seves Street, Altona | 54 J10 |

Table C3.8 – Sewer Emergency Relief Points in Altona and Seaholme in the City of Hobsons Bay

## Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. 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 around Altona and Seaholme at various rain totals and tide heights. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Altona & Seaholme Stormwater Drains
- Altona & Seaholme Coastal Inundation, Williamstown Gauge

# FLOOD INTELLIGENCE CARD – STORMWATER DRAINS, ALTONA & SEAHOLME (UNGAUGED)

**Version 3 – February 2019**

*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 | **Altona** |
| LOCATION | **City West Water Western No.2 Waste Purification Plant on Queen Street** |
| MELWAY REF: | **53 H12** |

| | |
|---|---|
| GAUGE NUMBER | **587047** |
| 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;<br>37mm in 30 mins;<br>47mm in 1 hour;<br>59mm in 2 hours;<br>67mm in 3 hours; or<br>83mm in 6 hours<br><br>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) | • Note: It is not known at what level infrastructure contained below starts being flooded<br>**Properties at Flood Risk**<br>**450 Properties in Total**<br>• **Cherrys Main Drain**<br>• 1, 3, 4, 5, 6, 7, 8 & 9 Chorley Avenue, Altona<br>• 1, 3, 4, 5, 6, 7, 8 & 10 Frazer Avenue, Altona<br>• 1, 2, 3, 4, 9 & 10 Kim Court, Altona<br>• 35, 37, 54, 55, 56, 57, 58, 59, 61, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102 & 104 Mcintyre Drive, Altona<br>• 10 & 12 Ransom Avenue, Altona<br>• **Mulga Avenue Main Drain**<br>• 27, 29, 30, 32 & 34 Curlew Avenue, Altona<br>• 19B, 21A, 21, 23, 29, Units 1-3/31, 33, Units 1-2/35, 36, 37, 38, 40, 42 44 & 46 Dove Avenue, Altona<br>• 1, 3, 5A, 5, 7, 8, 9, 10, 11, 12 & 13 Emu Avenue, Altona<br>• 345, 347, 349, 351, 353, 355, 357, 359 & 361 Esplanade , Altona<br>• 1/6, 2/6, 8 & 10 Galvin Street, Altona<br>• 1/38, 2/38, 3/38, 40, 53, 1/55, 2/55 & 57 Grieve Parade, Altona<br>• 16, 26, 27, 28, 29, 30 & 31 Harrington Street, Altona<br>• 1, 3, 5, 7, 9, 11, 13, 16, 18, 20, 22, 24, 26, 28, 1/35, 37, 38, 51, 54, 56 & 76 Linnet Street, Altona<br>• 2, 2A, 73, 75, 1/77, 2/77, 82, 84, Units 1-3/86, 116, 120, 122 & 124 Maidstone Street, | |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| | | Altona<br>• 15, 1/17, 2/17, 3/17 & 19 Mulga Street, Altona<br>• 240, 1/242, 2/242, 243, 244, 246, 248, 250, 252, 256 & 258 Queen Street, Altona<br>• 1/29, 2/29, 3/29, 4/29, 1/31, 2/31, 3/31, 4/31, 5/31, 52A, 52 & Units 1-3/54 Rayner Street, Altona<br>• 1 Robin Street, Altona<br>• 37A, 37 & 39 Rose Street, Altona<br>• 1/14, 1/14, 16, 18, 20, 22, 24, 26, 28, 33, 35, 37, 39, 41, 43 & 45 Seagull Avenue, Altona<br>• 20, 22, 1/23, 2/23 & 3/23 Stanley Street, Altona<br>• **Nelle Street Main Drain**<br>• 49 & 51 Bayview Street, Altona<br>• 37A, 1/39, 41A, 43A, 45A, 51, 53, 55, 56, 57, 58, 59, 60, 61, 62, 62, 62A, 63, 64, 65, Units 1-3/66, 67, Units 1-2/68, 69, 70, 71, Units 1-6/72, 73, 75, 76, 77, 78, 79, 1/80, 2/80, 81, 82, 83, Units 1-4/84, 85, Units 1-2/86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, Units 1-2/106, 107, 108, 109, 110, 111, 112, 114, 130, 132, Units 1-2/134, 136, 138, 140, 142A, 144, 144A, 146, Units 1-3/148, 156, 157, 158, 159, 160, 161, 162, 162B, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 175, 177, 179B, 181A, 181B & 183 Civic Parade, Altona<br>• 62, 64, 69, 71 & 73 David Street, Altona<br>• 56 Davies Street, Altona<br>• 2A Fresno Street, Altona<br>• 1/61, 2/61, 3/61, 4/61, 63, 66, 68 & 70 Mcbain Street, Altona<br>• 35, 37, 39, 41, 1/43, 2/43, 3/43, 1/45, 2/45, 3/45, 47, 49, 51, 1/53, 2/53, 55, 57, 59 & 61 Millers Road, Altona<br>• 49 & 51 Mount Street, Altona<br>• 1/123, 2/123, 3/123 & 125 Pier Street, Altona<br>• 70 Romawi Street, Altona<br>• 60A, 60, 62, 65 & 67 Sargood Street, Altona<br>• 1/28, 2/28, 30, 1/32, 2/32, 34, 35, 36, 37, 38, 39, 40, 41, Units 1-2/42, 43, 44, 45, 46, 47, 48, 50, 52, 53, 54 & 55 Seves Street, Altona<br>• 25, 27, 29, 31, 33 & 35 Central Avenue, Seaholme<br>• 38, 40, 1/42, 2/42, 3/42 & 44 Civic Parade, Seaholme<br>• 18A, 1/20, 2/20, 22, 24, 26, 28, 30, 32, 32A, 1/34, 2/34, 36, 38, 40, 58A & 60 Millers Road, Seaholme<br>• 2A, 1/2, 2/2, 4, 1/6, 2/6, 7, 8, 9, 10, 11, 12, 13, 14, 15, Units 1-2/16, 17, 18, 19, 20, 21, 23 & 25 Waratah Street, Seaholme<br>**Essential Infrastructure Impacted**<br>• Sewer Emergency Relief Points are located at Civic Pde and Seves Street; and on Manning Street, Altona<br>• Bus Routes 411, 412, 415, 903 & 944 may be impacted by flooding on roads<br>**Water Over Road (over 300mm depth)**<br>**Cherrys Main Drain** | |

| Design Rainfall Depths (mm) – *Indication of Possible Flooding* | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| | | • Grieve Parade, Altona North at Kororoit Creek Road<br>• Kororoit Creek Road, Altona at Cherry Creek<br>• Taras Avenue, Altona North<br>**Nellie Street Main Drain**<br>• Acacia Avenue, Seaholme<br>• Central Avenue, Seaholme near Acacia Avenue<br>• Civic Parade, Altona between Millers Road and Grieve Parade<br>• Civic Parade, Altona/Seaholme near Millers Road<br>• McIntyre Drive, Altona<br>• Millers Road, Altona south of Civic Parade intersection<br>• Seves Street, Altona north of the railway line<br>• Waratah Street, Seaholme<br>• Wattle Grove, Seaholme<br>**Mulga Avenue Drain**<br>• Dove Avenue, Altona<br>• Linnet Street, Altona<br>• Robin Street, Altona<br>• Seagull Avenue, Altona<br>• Stanley Street, Altona | |

Table C3.8 – Breakdown of possible consequences at various rainfall intensities around Altona and Seaholme with operational considerations

# FLOOD INTELLIGENCE CARD – WILLIAMSTOWN GAUGE, PORT PHILLIP BAY STORM SURGE

**Version 3 – February 2019**

*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 | **Royal Yacht Club of Victoria, Nelson Place, Williamstown** |
| MELWAY REFERENCE: | **56 E9** |
| STREAM: | **Port Phillip Bay** |
| GAUGE NUMBER: | **230118A** |
| GAUGE ZERO: | **0.00m AHD** |
| GAUGE TYPE | **Tide Level** |

| | |
|---|---|
| MINOR: | **Not Established** |
| MODERATE: | **Not Established** |
| MAJOR | **Not Established** |
| FLOOD WALL HEIGHT: | **Unknown** |
| TELEMETRIC/MANUAL | **Telemetric** |
| HIGHEST RECORDED FLOOD: | **1.29m (7th November 1994)** |

| Bay Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 1.12m | 5th July 2011 High Tide Level | | |
| 1.19m | 26th April 2009 High Tide Level | • Extremely strong W-SW winds and low atmospheric pressure conditions caused high tides. | |
| 1.28m | 24th June 2014 High Tide Level | | |
| 1.29m | 7th November 1994 High Tide Level | | |
| 1.50m | 1% AEP (100yr ARI) Flood Level | **Properties at Flood Risk**<br>**226 Properties in Total**<br>• 1, 2, 3, 4, 5, 6, 8, & 10 Acacia Avenue, Seaholme<br>• 2-4, 6, 8, 10, 1/12, 2/12, 16, 18, 20 & 22 Civic Parade, Seaholme<br>• 1, 3, Units 1-3/5, 7 & 9 Central Avenue, Seaholme<br>• 4, 6 & 8 Wattle Grove, Seaholme<br>• Units 1-5/8, 10, 12, 14, 16, 18, 20, 22 & 24 Station Street, Seaholme<br>• 1, 3, 5, 7, 9, 9A, 10, 11, 13, 15, 17, 19, 19A, 21, 23A, 23B, 23C, 25, 27, 27A, 29, 29A, 31, 33 & 35 Beach Street, Seaholme<br>• 1, 1A, 2, 2A, 2B, 2C, 3, 4, 5 & 5A Garden Grove, Seaholme | VICSES will provide warnings using VicEmergency to Hobson's Bay Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES Central Duty Officer, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level |

| Bay Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| | | • 1-3, 5, 5A, 7, 9, 11, 13, 15, 17, 21, 25, 27, 29, 35, 47, 49, 51, 61, 63-71, 73, 77, 79, 85, 87, 95, Units 1-3/97, 103, 107, 125-129, 133, 141-153, Units 1-5/175, 179, 181, 185, 187, 187A, 189, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, Units 1-6/211, 223, 225, Units 1-2/227, 229, 231, 231A, Units 1-3/233, Units 1-5/237, 1/239, 243, Units 1-2/247, 249, 251, 253, 261, 263, 263A, 236B, 265, 267, 269, 271, 275, 277, 345, 347, 349, 351, 353, 355, 357, 359, 361, 365, 367 & Units 1-11/369 Esplanade, Altona<br>• 1, 3, 52, 206, Units 3-4/208, 210, 220, 240, Units 1-2/242, 244, 246, 248, 250, 252, 256, 258, 260, 262, 264, 266 & 268 Queen Street, Altona<br>• Units 1-3/1 Sargood Street, Altona<br>• 6 McBain Street, Altona<br>• 3 Sarros Street, Altona<br>• 4, 5, 7 & 9 Correa Street, Altona<br>• 1 Maidstone Street, Altona<br>**Community Infrastructure at Flood Risk**<br>• W G Cresser Reserve, Beach Street, Seaholme<br>• Apex Park, Queen Street, Altona<br>**Essential Infrastructure Impacted**<br>• The Werribee Railway Line via Altona may be inundated between the Kororoit Creek bridge and Seaholme Station<br>**Water Over Road**<br>• Acacia Avenue, Seaholme<br>• Altona Road, Seaholme at Kororoit Creek and at Cherry's Drain<br>• Beach Street, Seaholme<br>• Correa Street, Altona<br>• Esplanade, from Beach Street, Seaholme to Queen Street Roundabout, Altona<br>• Garden Grove, Altona<br>• Station Street, Seaholme | of incident<br><br>VICSES to respond on a request by request basis.<br><br>Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements |

Table C3.9 – Breakdown of likely consequences at various Williamstown gauge level heights along the Port Phillip Bay Coastline in Altona and Seaholme with operational considerations

# APPENDIX C4 – SKELETON CREEK & LAVERTON MAIN DRAIN FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

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

| Summary of Consequences in a 1% AEP (100yr ARI) flood along Skeleton Creek | | | | | |
|---|---|---|---|---|---|
| **Property** | | | | | |
| **Properties** | **8** | | | | |
| Residential | 8 | | | | |
| 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 | 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 | Skeleton Creek Bicycle Trail | Camping Grounds | 0 | |
| **Government Boundaries** | | | | | |
| Local Gov't Areas | 1 | Hobsons Bay | CMA | 1 | Port Phillip & Westernport |
| Adjacent LGAs | 1 | Wyndham | CFA District | 0 | |
| SES Unit Area | 1 | Hobsons Bay | MFB District | 1 | Western |

Table C4.1 – Consequence Summary of 1% AEP flood along Skeleton Creek

| Summary of Consequences in a 1% AEP (100yr ARI) flood along Laverton Main Drain | | | | | |
|---|---|---|---|---|---|
| **Property** | | | | | |
| **Properties** | **18** | | | | |
| Residential | 18 | | | | |
| 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 | Merton Street | 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 | Laverton Creek Trail | Camping Grounds | 0 | |
| **Government Boundaries** | | | | | |
| Local Gov't Areas | 1 | Hobsons Bay | CMA | 1 | Port Phillip & Westernport |
| Adjacent LGAs | 1 | Wyndham | CFA District | 0 | |
| SES Unit Area | 1 | Hobsons Bay | MFB District | 1 | Western |

Table C4.2 – Consequence Summary of 1% AEP flood along Laverton Main Drain

Skeleton Creek flows through the Hobsons Bay suburbs of Seabrook & Altona Meadows, forming the southern border of the Municipality in Altona Meadows where the creek then discharges into Port Phillip Bay. Residential properties line either side of the creek, but with many of this area being new development, few flooding consequences are expected. The exception to this is properties along Carinza Avenue in Altona Meadows and on Ida Place & St Anthony Court in Seabrook where properties may be at risk of flooding from the creek.

Skeleton Creek flows from the northwest starting in the City of Melton, then flowing through Wyndham City. A telemetered stream level gauge is located in Hoppers Crossing.

## Warning Times

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for Skeleton Creek. All flood response actions must therefore be driven by rainfall and / or river level observations. A telemetered water level / flood gauge is located at Hoppers Crossing within the Skeleton Creek catchment.

| Hydrographic Monitoring Station | Station No. | Location | Owner | Gauge Type | Melway Ref |
|---|---|---|---|---|---|
| Skeleton Creek at Hoppers Crossing | 231110A | East side of the creek, south side of Sayers Road bridge | Melbourne Water | Stream Level & Rain | 203 A6 |
| Laverton RAAF AWS | 87031 | RAAF Williams Laverton Base, off Roland Road | Bureau of Meteorology | Rain | 53 A8 |
| Altona | 587047 | City West Water Western No.2 Waste Purification Plant on Queen Street | Melbourne Water | Rain | 53 H12 |

Table C4.3 – Hydrographic Monitoring Stations within the Skeleton Creek and Laverton Main Drain catchments

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. 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

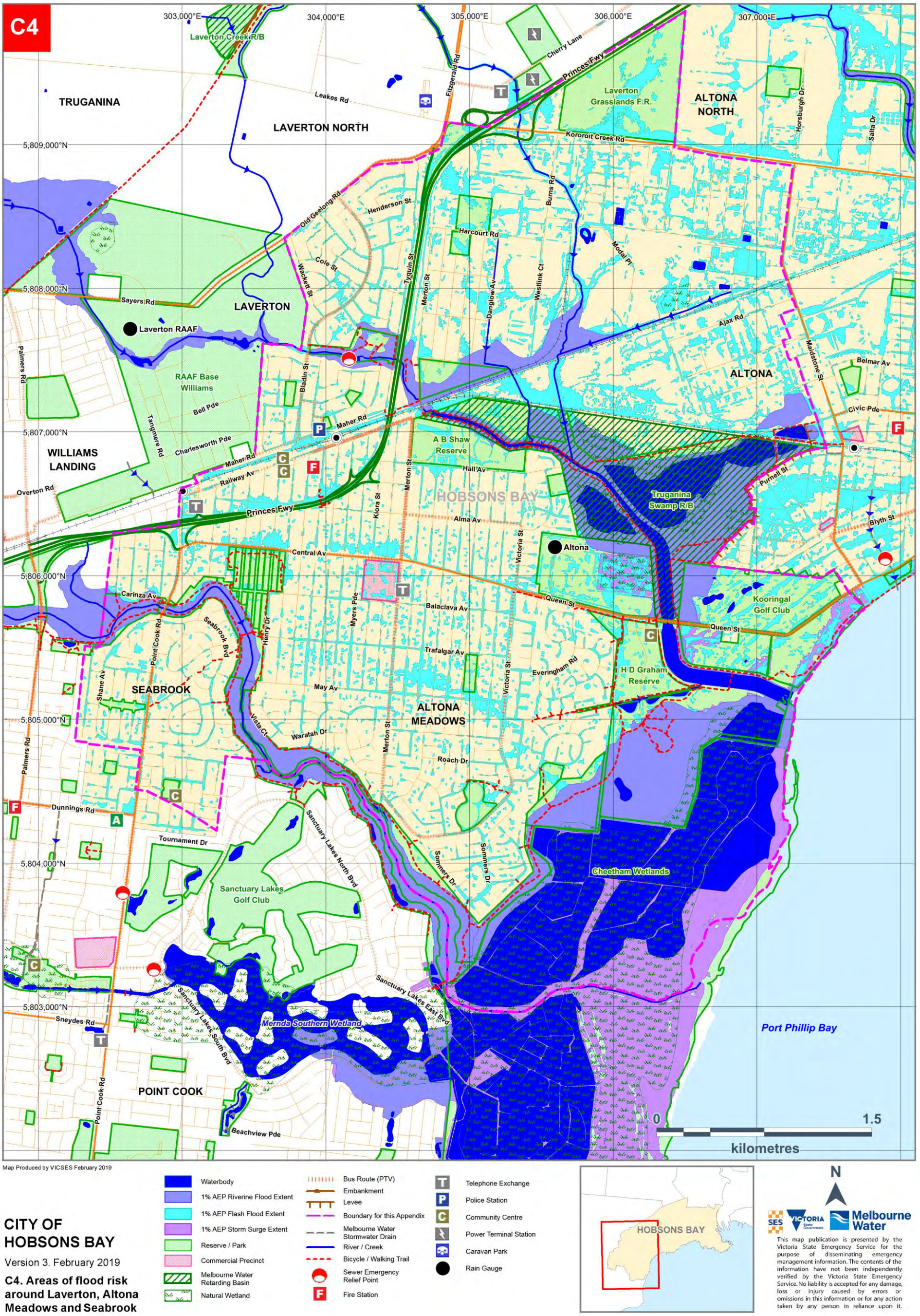


Figure C4 – Areas of flood risk around Skeleton Creek in the City of Hobsons Bay

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Skeleton Creek and Laverton Main Drain. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Skeleton Creek (Melbourne Water, August 2008) and the Laverton Main Drain (Melbourne Water, June 2012) flood mapping and risk assessment programs. *This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.*

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

| Street No. at Risk | Street | Suburb | Along Melbourne Water Watercourse | Flood Risk Type |
|---|---|---|---|---|
| 1 | Anthony Court | Seabrook | Skeleton Creek | Riverine |
| 3 | Anthony Court | Seabrook | Skeleton Creek | Riverine |
| 4 | Carinza Avenue | Altona Meadows | Skeleton Creek | Riverine |
| 8 | Carinza Avenue | Altona Meadows | Skeleton Creek | Riverine |
| 10 | Carinza Avenue | Altona Meadows | Skeleton Creek | Riverine |
| 3 | Ida Place | Seabrook | Skeleton Creek | Riverine |
| 4 | Ida Place | Seabrook | Skeleton Creek | Riverine |
| 5 | Ida Place | Seabrook | Skeleton Creek | Riverine |
| 2/18 | Charlesworth Street | Laverton | Laverton Main Drain | Riverine |
| 22 | Charlesworth Street | Laverton | Laverton Main Drain | Riverine |
| 24 | Charlesworth Street | Laverton | Laverton Main Drain | Riverine |
| 26 | Eades Street | Laverton | Laverton Main Drain | Riverine |
| 35 | Eades Street | Laverton | Laverton Main Drain | Riverine |
| 15 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 17 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 19 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 21 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 23 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 25 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 27 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 29 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 31 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 33 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 37 | Jennings Street | Laverton | Laverton Main Drain | Riverine |
| 2 | Watts Street | Laverton | Laverton Main Drain | Riverine |
| 18 | Williams Road | Laverton | Laverton Main Drain | Riverine |

| Total |
|---|
| 26 |

Table C4.4 – Properties at risk of flooding along the Skeleton Creek and Laverton Main Drain in the City of Hobsons Bay

## Isolation

No major isolation risks exist for areas around Seabrook & Altona Meadows 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 Hobsons Bay is available via the website at: https://static.ptv.vic.gov.au/siteassets/Maps/Localities/PDFs/21_Hobsons_Bay_LAM.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Seabrook & Altona Meadows 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 Seabrook & Altona Meadows. Check the VicRoads website for more details: https://traffic.vicroads.vic.gov.au/

| VicRoads Roads flooded in a 1% AEP (100yr ARI) event |
|---|
| • Nil |

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

| Hobsons Bay City Council Roads flooded in a 1% AEP (100yr ARI) event | |
|---|---|
| **ALTONA MEADOWS** | **LAVERTON** |
| • Carinza Avenue | • Alma Avenue |
| • Creek Waters Close | • Jennings Street |
| • Crown Street South | • Williams Road |
| • Hyde Court | **SEABROOK** |
| • Markham Way | • Kiata Court |
| • Merton Street | • The Terrace |
| • North Avenue | |
| • Skehan Boulevard | |

Table C4.6 – Hobsons 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 |
|---|---|---|---|---|---|---|---|---|---|
| Truganina Swamp | Laverton Main Drain | 147.6 ha | 1057 ML | N/A | Unavailable | 1.1m | Very Low | 0 | 54 B11 |

Table C4.7 – Melbourne Water Retarding Basins within the Skeleton Creek and Laverton Main Drain catchments in Hobsons Bay

| Hobsons Bay City Council Retarding Basin | Location | Area | Melway Reference |
|---|---|---|---|
| Drainage Reserve | 6-8 Dunnings Road, Seabrook | 0.22 ha | 208 A4 |

Table C4.8 – Hobsons Bay City Council Retarding Basins within the Skeleton Creek and Laverton Main Drain catchments in Hobsons Bay

### Levees

| Levee | Reach | Side | Levee Height | Levee Length | Expected Level of Protection | ANCOLD Hazard Rating | Consequences of Failure | Melway Reference |
|---|---|---|---|---|---|---|---|---|
| Truganina Swamp, Altona | Park Parade to Lark Street | South | 1.5m (2.86m AHD) | 1.4km | 1% AEP flood level with approx. 1.0m freeboard | High C | 53 residential properties flooded along Purnell St and Bell Ave | 54 C10 - 54 C9 |
| Truganina Swamp, Altona | Lark Street to Queen Street | South | 1.4m (2.86m AHD) | 0.5km | 1% AEP flood level with approx. 1.0m freeboard | High A | 76 residential properties including the Port Phillip Retirement Village along Grant Ave, Stewart Ave and Bell Ave | 54 C10 - 54 C12 |

Table C4.9 – Levees along the Laverton Main Drain in the City of Hobsons Bay

## Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located within the Skeleton Creek and Laverton Main Drain catchments is contained within the following table. To view their locations, view mapping in **Appendix F**.

### Sewer Emergency Relief Points

| On Drain / Waterway | Bank / Side of Waterway | Location | Melway Reference |
|---|---|---|---|
| Laverton Main Drain | South | Charlesworth Street, Laverton | 53 E8 |

Table C4.10 – Sewer Emergency Relief Points along the Laverton Main Drain in Hobsons Bay

## Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. . 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 Skeleton Creek and the Laverton Main Drain at various creek heights or rain totals within Hobsons Bay. 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:

- Skeleton Creek at Seabrook and Altona Meadows
- Laverton Main Drain, Laverton

# FLOOD INTELLIGENCE CARD – HOPPERS CROSSING GAUGE, SKELETON CREEK

**Version 3 – February 2019**

*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 | **East side of the creek, south side of Sayers Road bridge** |
| MELWAY REFERENCE: | **203 A6** |
| STREAM: | **Skeleton Creek** |
| GAUGE NUMBER: | **231110A** |
| GAUGE ZERO: | **11.71m 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: | **3.47m (3rd February 2005)** |

| Creek Height | Annual Exceedance Probability (% AEP) | Consequence / Impact | Operational Considerations |
|---|---|---|---|
| 3.69m | 1% AEP (100yr ARI) Flood Level | **Properties at Flood Risk**<br>**8 Properties in Total**<br>• 1 & 3 St Anthony Court, Seabrook<br>• 3, 4 & 5 Ida Place, Seabrook<br>• 4, 8 & 10 Carinza Avenue, Altona Meadows<br>**Community Infrastructure Impacted**<br>• Skeleton Creek Bicycle Trail flooded at various locations<br>• Pedestrian Footbridge at Ravenswood Court flooded<br>**Water Over Road**<br>• Carinza Avenue, Altona Meadows<br>• Kiata Court, Seabrook<br>• The Terrace, Seabrook<br>• Creek Waters Close, Altona Meadows<br>• Markham Way, Altona Meadows | VICSES will provide warnings using VicEmergency to Hobson's Bay Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.<br><br>The VICSES RDO in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident<br><br>VICSES to respond on a request by request basis.<br><br>Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements |

Table C4.11 – Breakdown of likely consequences at various Hoppers Crossing gauge level heights along Skeleton Creek for Hobsons Bay with operational considerations

## FLOOD INTELLIGENCE CARD – LAVERTON MAIN DRAIN, LAVERTON & ALTONA MEADOWS (UNGAUGED)

**Version 1 – February 2019**

*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 | **Laverton RAAF AWS** |
| LOCATION | **RAAF Williams Laverton Base, off Roland Road** |
| MELWAY REF: | **53 A8** |

| | |
|---|---|
| GAUGE NUMBER | **87031** |
| 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;<br>37mm in 30 mins;<br>47mm in 1 hour;<br>59mm in 2 hours;<br>67mm in 3 hours; or<br>83mm in 6 hours<br><br>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) | • Note: It is not known at what level infrastructure contained below starts being flooded<br>**Properties at Flood Risk**<br>**18 Properties in Total**<br>• 2/18, 22 & 24 Charlesworth Street, Laverton<br>• 26 & 35 Eades Street, Laverton<br>• 15, 17, 19, 21, 23, 25, 27, 29, 31, 33 & 37 Jennings Street, Laverton<br>• 2 Watts Street, Laverton<br>• 18 Williams Road, Laverton<br>**Essential Infrastructure Likely Impacted**<br>• Sewer Emergency Relief Point near Charlesworth Street, Laverton<br>**Tourism / Recreation Likely Impacted**<br>• Laverton Creek Trail likely flooded in parts<br>**Water Over Road**<br>• Jennings Street, Laverton<br>• Merton Street, Altona Meadows<br>• Williams Road, Laverton | |

Table C4.12 – Breakdown of possible consequences at various rainfall intensities along the Laverton Main Drain in Hobsons 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 Health Emergency Response Plan (SHERP) for details);
- Essential services have been damaged and are not available to a community and evacuation is considered the most effective risk treatment.

The following should be considered when planning for evacuation:

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

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

There are currently no pre-determined triggers for evacuation within the Hobson's Bay Council area.

## 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 may provide advice regarding most appropriate evacuation routes and locations for at-risk communities to evacuate to.

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

VicPol will control security of evacuated areas.

Evacuees will be encouraged to move using their own transport where possible. Transport for those without vehicles or other means will be arranged at the request of the 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 Hobson's Council Council's MRM.

## Phase 4 – Shelter

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

Emergency Relief Centres in the City of Hobsons Bay area are detailed in the City of Hobsons Bay Relief and Recovery Plan.

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 Incident Emergency Management Team (IEMT).

**Animal Shelter**

The need for animal shelter compounds will be determined dependent on the location and size of the event.

Details of emergency relief and recovery arrangements can be found in the Hobsons Bay Relief and Recovery Plan.

**Caravans**

No caravans evacuation sites have been identified in the Hobsons Bay City Council area.

## Phase 5 – Return

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

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

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

Considerations for deciding whether to evacuate include:

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

## Disruption to Services

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

| Service | Impact | Trigger Point for action | Strategy/Temporary Measures |
|---|---|---|---|
| General Transport | General road closures across network | Inundation of road network and associated damage to an extent that it is unsafe for vehicles to use road | Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage.. |

| | | | |
|---|---|---|---|
| School Bus Services | General road closures across network leading to student pick ups being suspended | Inundation of road network and associated damage to an extent that it is unsafe for vehicles to use road | Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage..<br>Alternate student collection points to be established. |

## Essential Infrastructure and Property Protection

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

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

| Facility | Impact | Trigger Point for action | Strategy/Temporary Measures |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

For small scale events sandbags can be purchased from some hardware and garden suppliers such as Bunnings. 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 Hobson's Bay Council resources to support rescue activities should be forwarded to the MECC or EMLO if an ICC has been established.

Resources are available from the Hobson's Bay SES Unit to assist with rescue operations – specific details of equipment and resources available can be obtained from the VICSES RDO. .

No High risk areas/communities ( i.e. low-lying islands where rescues might be required have been identified, other than the occurrence of flash flooding over roadways.

# 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 the VicEmergency website. Storm and Flood Warning Products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings. See below for an example of a BOM warning on the VicEmergency page.

The Hobsons Bay area is more vulnerable to flash flooding than riverine flooding. While the BoM provides severe weather warnings, which can include the risk of flash flooding, specific flash flood forecasts and warnings (i.e. including specific location and timing information) are not generally provided. This is due to the unpredictable nature and speed of flash flooding. As a result, no flood bulletins will be issued prior to flash flooding.

## 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 RDO or the established ICC will normally be responsible for drafting, authorising and issuing of Flood Bulletins, using the VicEmergency website.

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

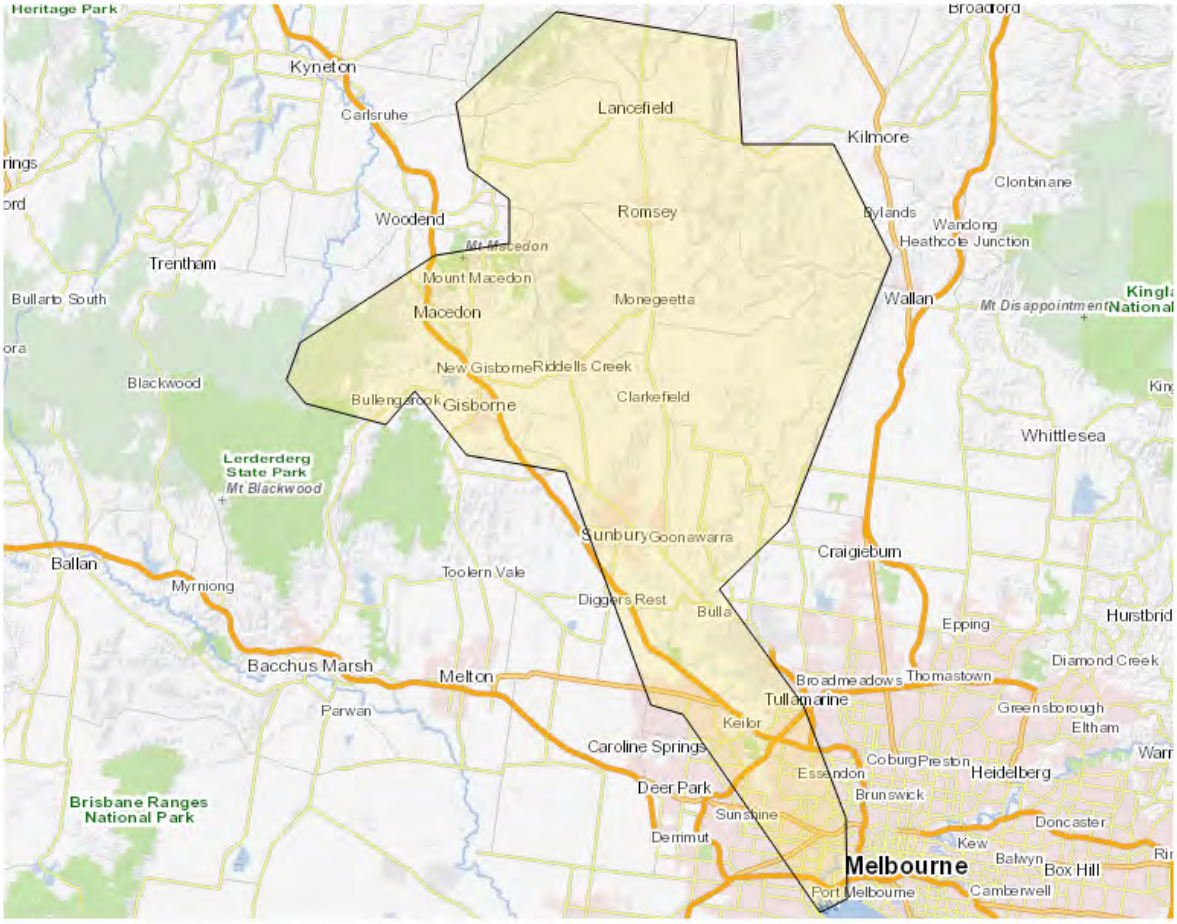
There are no local flood warning systems or arrangements in place in the City of Hobsons Bay.

## BOM Flood Warning Example

ADVICE - FLOOD

| | |
|---|---|
| **Incident Location:** | Maribyrnong |
| **Incident Name:** | MaribyrnongFloodSept2016 |
| **Issued:** | Set at publish time |
| **Next Update Expected:** | |

Map



## Message

This **Minor Flood Warning** is being issued for Maribyrnong River.

- The Maribyrnong River catchment has received rainfall averaging about 31mm since 0900am yesterday. Rainfall totals of 5mm have been forecast for the catchment in the next 2 hours.
- Water levels of the Maribyrnong River and its tributaries at various locations are rising in response to the rain.
- The level of the Deep Creek at Darraweit Guim is currently 5.41m and rising. It is expected to peak above the Minor Flood Level (5.50m) this morning.
- Minor flooding in the Deep Creek and Maribyrnong River catchment is expected to affect low lying areas adjacent to the waterway. Minor roads may be closed.

The river heights at 08.14am 14/09/2016 were:

- Deep Creek at Doggetts Bridge, Lancefield: 2.22 metres, rising
- Deep Creek at Darraweit Guim: 5.47 metres, falling
- Deep Creek Creek at Konagaderra: 3.62 metres, falling
- Bolinda Creek at Clarkefield: 1.19 metres, rising
- Deep Creek at Bulla: 2.39 metres, falling
- Rosslynne Reservoir, Head Gauge: 38.52 metres, rising
- Jacksons Creek at Sunbury: 2.13 metres, rising
- Steele Creek at Keilor East: 1.19 metres, rising
- Maribyrnong River at Keilor North: 3.58 metres, rising
- Maribyrnong River at Keilor: 1.84 metres, rising
- Maribyrnong River at Maribyrnong: 0.04 metres, rising

### Stay informed - monitor your local conditions and remain alert.

**What you should do:**

- Be prepared to act if your situation changes.
- You should stay informed by listening to emergency broadcasters and monitoring warnings.
- Monitor weather forecasts and river levels. Go to www.bom.gov.au/vic/warnings.
- Floodwater is dangerous - never drive, walk or ride through floodwater.

**Impacts in your area:**

- Flooding above floor level of a single story home is likely to occur in some locations.
- Local roads may be closed and low bridges may be underwater.
- Areas around rivers and streams may be flooded.

This message was issued by State Emergency Service.

**The next update is expected by 4PM this afternoon or as the situation changes.**

**Flood information:**

- For river heights check www.bom.gov.au or phone 1300 659 217.
- For urgent animal welfare issues call Agriculture Victoria on 136 186 or your local vet.

# APPENDIX F – MAPS

## Overview

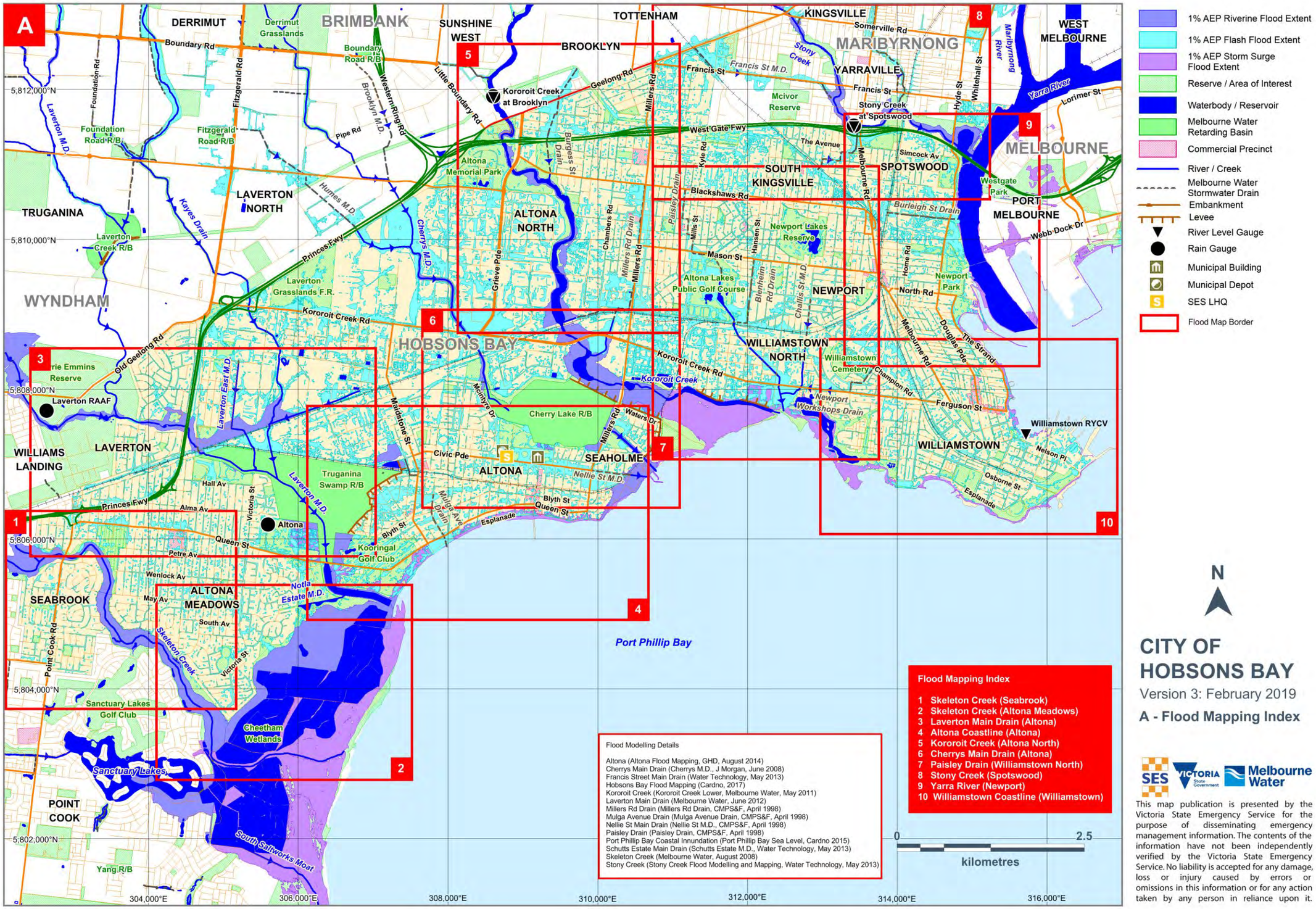
Maps considered useful to flood response are included in this Appendix. They include:

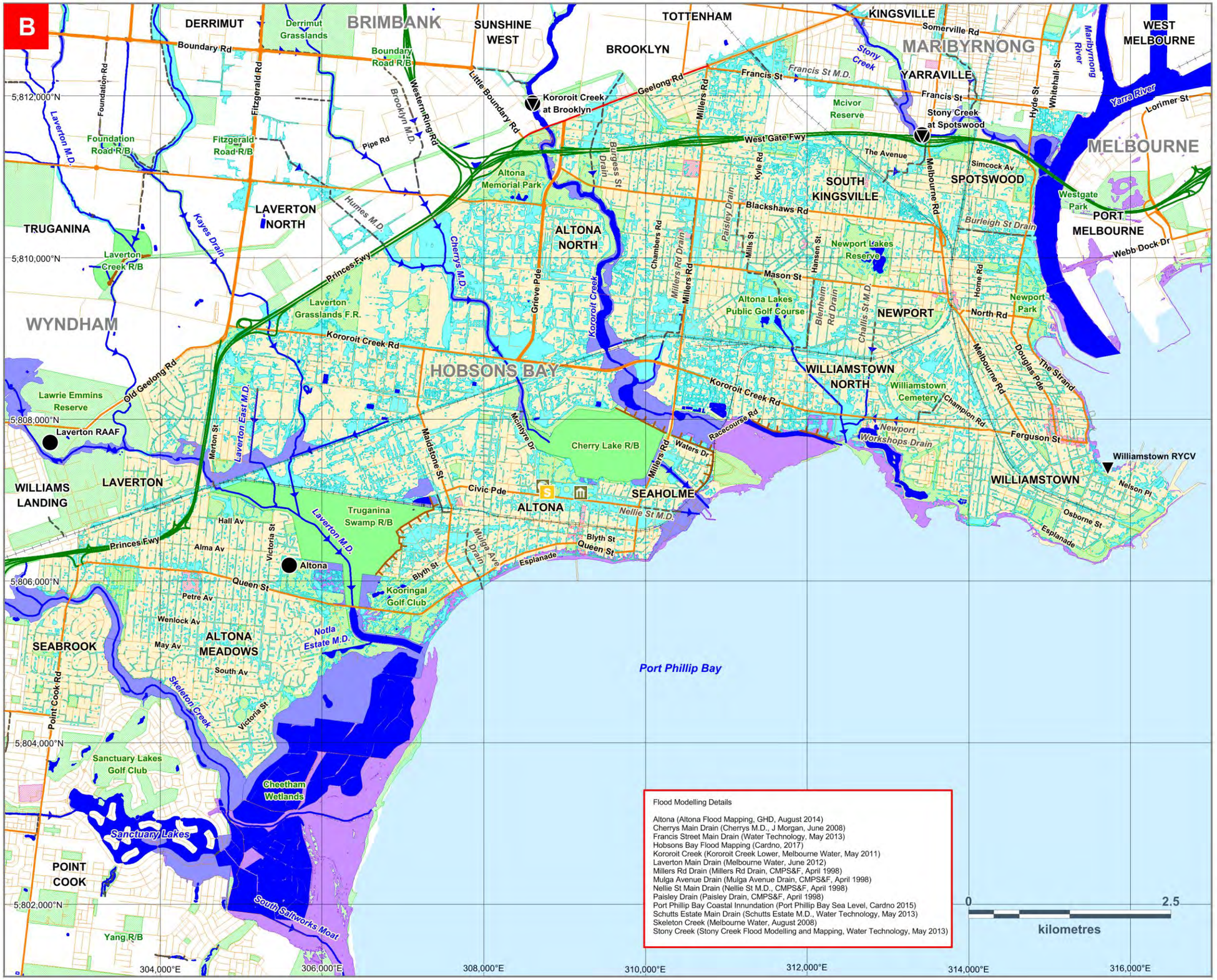
- A map outlining a series of flooding hot spot maps within the City of Hobsons Bay.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within the City of Hobsons Bay and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 10 maps showing flooding hot spots within the City of Hobsons Bay 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 Hobsons Bay 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 DELWP 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 DELWP's mapshare website http://mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&locale=en-AU

## City of Hobsons Bay Municipal Maps (sourced Melbourne Water GIS)




B
DERRIMUT
Derrimut Grasslands
BRIMBANK
SUNSHINE WEST
TOTTENHAM
BROOKLYN
KINGSVILLE
MARIBYRNONG
YARRAVILLE
WEST MELBOURNE
MELBOURNE
SOUTH KINGSVILLE
SPOTSWOOD
PORT MELBOURNE
TRUGANINA
LAVERTON NORTH
ALTONA NORTH
NEWPORT
WILLIAMSTOWN NORTH
WYNDHAM
HOBSONS BAY
WILLIAMS LANDING
LAVERTON
SEAHOLME
ALTONA
WILLIAMSTOWN
SEABROOK
ALTONA MEADOWS
POINT COOK
Port Phillip Bay
Boundary Rd
Geelong Rd
Francis St
Somerville Rd
Stony Creek
Maribyrnong River
Yarra River
Lorimer St
Webb Dock Dr
Foundation Rd
Fitzgerald Rd
Western Ring Rd
Little Boundary Rd
Millers Rd
Hyde St
Whitehall St
Pipe Rd
West Gate Fwy
The Avenue
Simcock Av
Melbourne Rd
Kyle Rd
Burgess St Drain
Paisley Drain
Blackshaws Rd
Burleigh St Drain
Mills St
Hansen St
Chambers Rd
Grieve Pde
Princes Fwy
Kororoit Creek Rd
Old Geelong Rd
Home Rd
North Rd
Douglas Pde
The Strand
Ferguson St
Racecourse Rd
Champion Rd
Waters Dr
Maidstone St
Merton St
Victoria St
Civic Pde
Nellie St M.D.
Blyth St
Queen St
Esplanade
Nelson Pl
Osborne St
Hall Av
Alma Av
Petre Av
Wenlock Av
May Av
South Av
Point Cook Rd
Skeleton Creek
Notla Estate M.D.
Cherrys M.D.
Kororoit Creek
Laverton M.D.
Kayes Drain
Hunes M.D.
Brooklyn M.D.
Laverton East M.D.
Mulga Ave Drain
Blenheim Rd Drain
Challis St M.D.
Francis St M.D.
Kororoit Creek at Brooklyn
Stony Creek at Spotswood
Williamstown RYCV
Altona
Derrimut Grasslands
Boundary Road R/B
Foundation Road R/B
Fitzgerald Road R/B
Altona Memorial Park
Laverton Creek R/B
Laverton Grasslands F.R.
Lawrie Emmins Reserve
Laverton RAAF
Truganina Swamp R/B
Cherry Lake R/B
Kooringal Golf Club
Sanctuary Lakes Golf Club
Cheetham Wetlands
Sanctuary Lakes
Yang R/B
Mcivor Reserve
Newport Lakes Reserve
Altona Lakes Public Golf Course
Williamstown Cemetery
Newport Workshops Drain
Westgate Park
Newport Park
5,812,000°N
5,810,000°N
5,808,000°N
5,806,000°N
5,804,000°N
5,802,000°N
304,000°E
306,000°E
308,000°E
310,000°E
312,000°E
314,000°E
316,000°E
Flood Modelling Details
Altona (Altona Flood Mapping, GHD, August 2014)
Cherrys Main Drain (Cherrys M.D., J Morgan, June 2008)
Francis Street Main Drain (Water Technology, May 2013)
Hobsons Bay Flood Mapping (Cardno, 2017)
Kororoit Creek (Kororoit Creek Lower, Melbourne Water, May 2011)
Laverton Main Drain (Melbourne Water, June 2012)
Millers Rd Drain (Millers Rd Drain, CMPS&F, April 1998)
Mulga Avenue Drain (Mulga Avenue Drain, CMPS&F, April 1998)
Nellie St Main Drain (Nellie St M.D., CMPS&F, April 1998)
Paisley Drain (Paisley Drain, CMPS&F, April 1998)
Port Phillip Bay Coastal Innundation (Port Phillip Bay Sea Level, Cardno 2015)
Schutts Estate Main Drain (Schutts Estate M.D., Water Technology, May 2013)
Skeleton Creek (Melbourne Water, August 2008)
Stony Creek (Stony Creek Flood Modelling and Mapping, Water Technology, May 2013)
0
2.5
kilometres
1% AEP Riverine Flood Extent
1% AEP Flash Flood Extent
1% AEP Storm Surge Flood Extent
Reserve / Area of Interest
Waterbody / Reservoir
Melbourne Water Retarding Basin
Commercial Precinct
River / Creek
Melbourne Water Stormwater Drain
Embankment
Levee
River Level Gauge
Rain Gauge
Municipal Building
Municipal Depot
SES LHQ
N
CITY OF HOBSONS BAY
Version 3: February 2019
B - 1% AEP (100yr ARI) Flood Extent
SES
VICTORIA State Government
Melbourne Water
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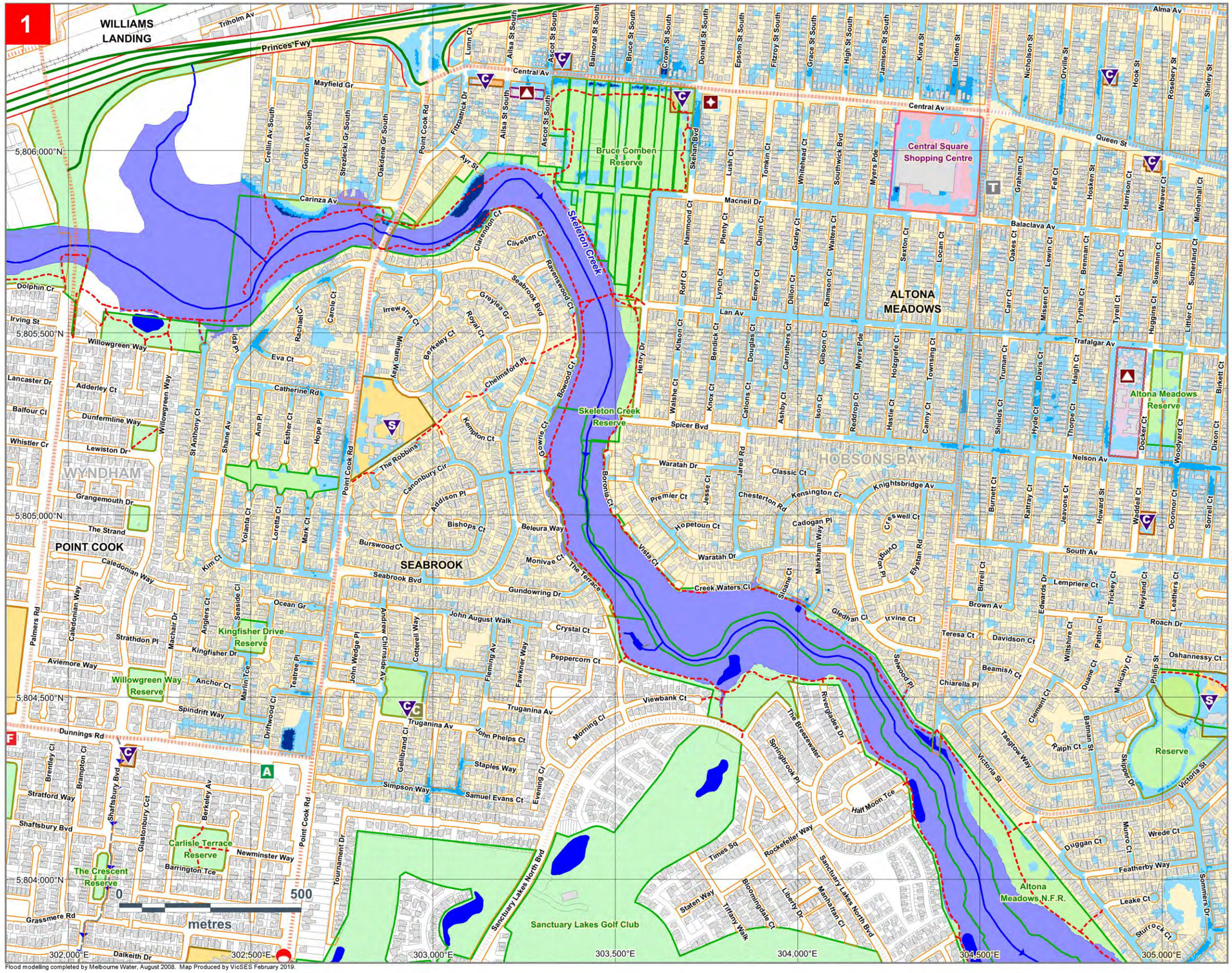
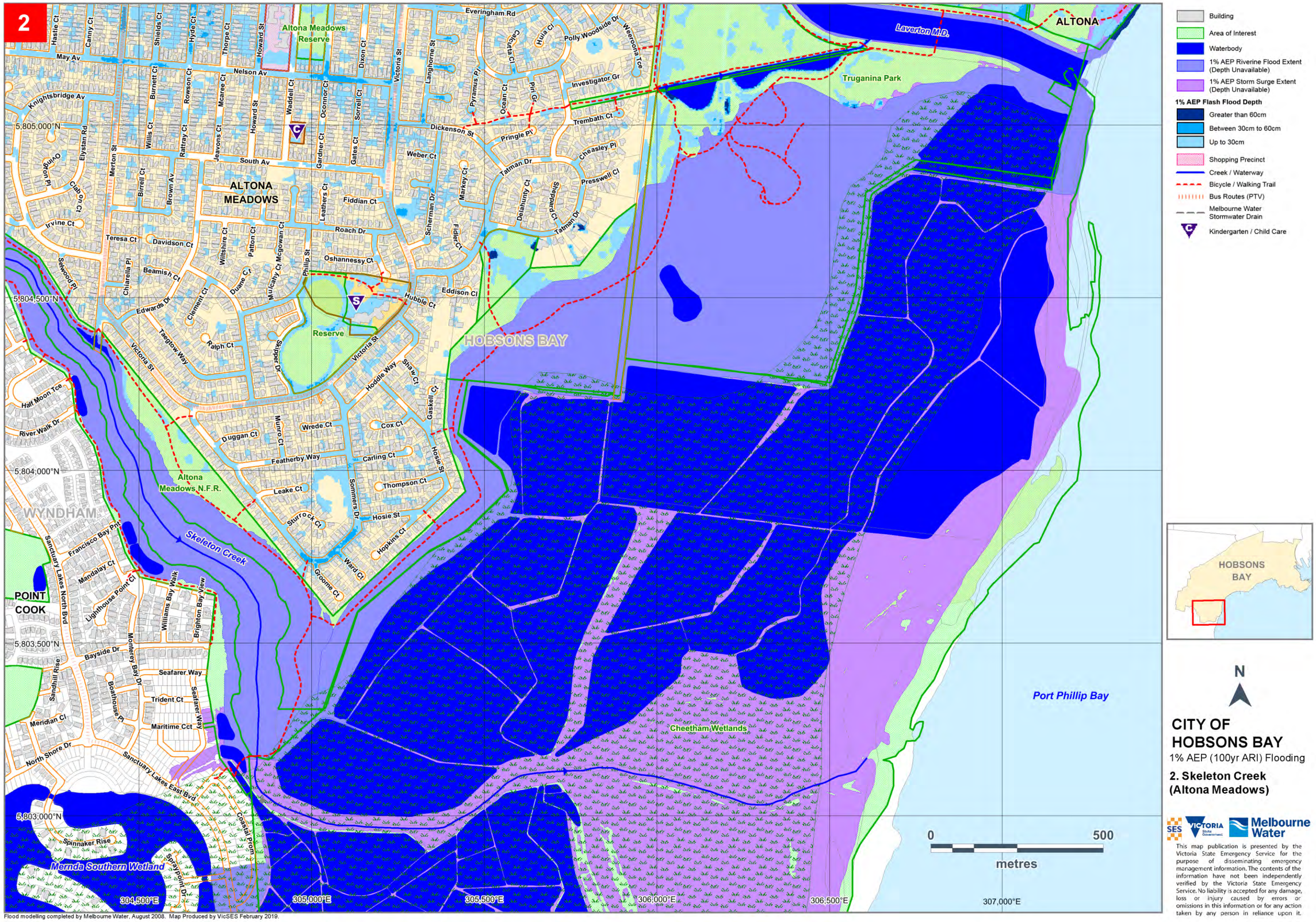
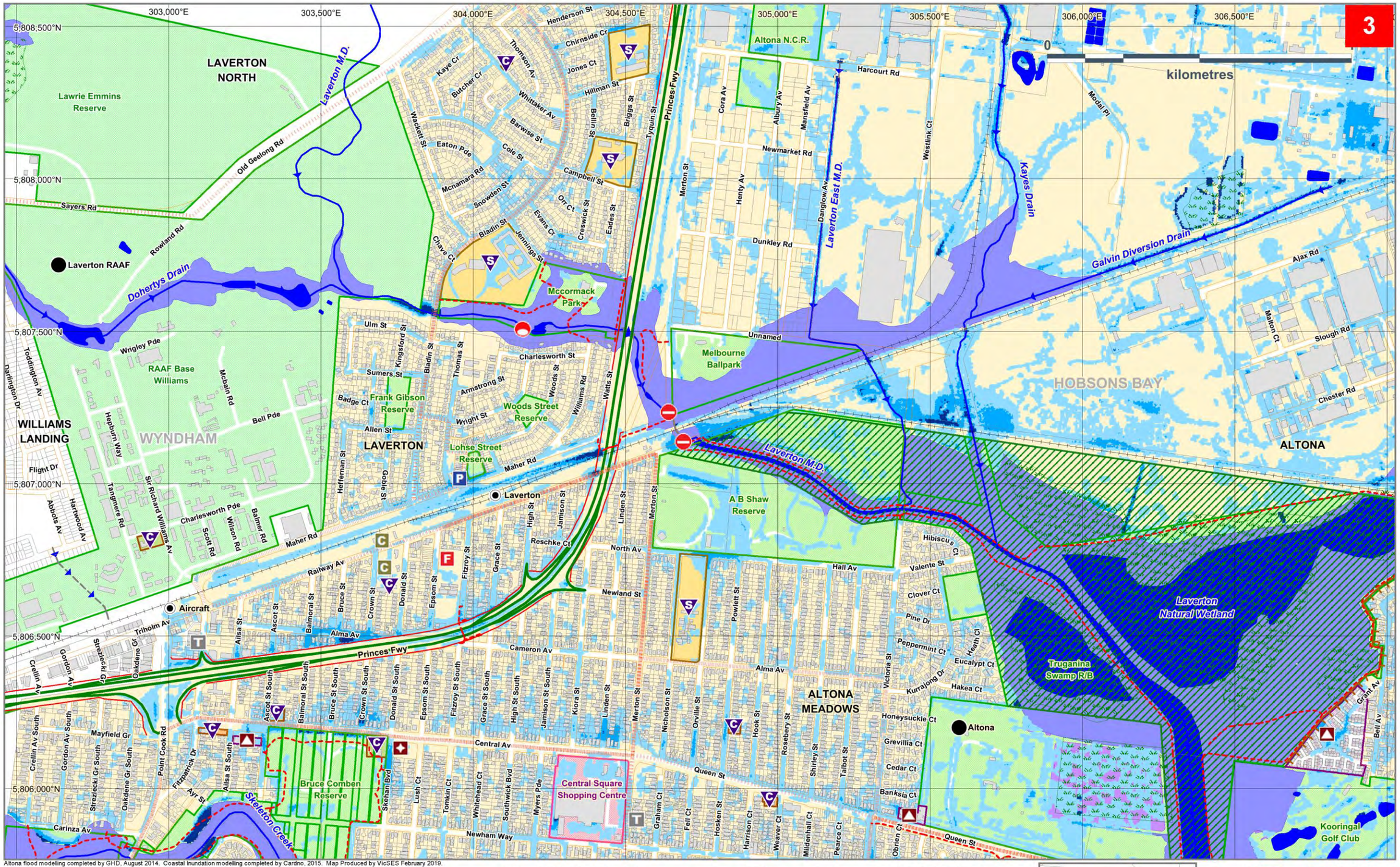
## Flood Extent Maps (sourced Melbourne Water GIS)




Flood modelling completed by Melbourne Water, August 2008. Map Produced by VicSES February 2019.




Flood modelling completed by Melbourne Water, August 2008. Map Produced by VicSES February 2019.




Altona flood modelling completed by GHD, August 2014. Coastal Inundation modelling completed by Cardno, 2015. Map Produced by VicSES February 2019.

## CITY OF HOBSONS BAY

1% AEP (100yr ARI) Flooding

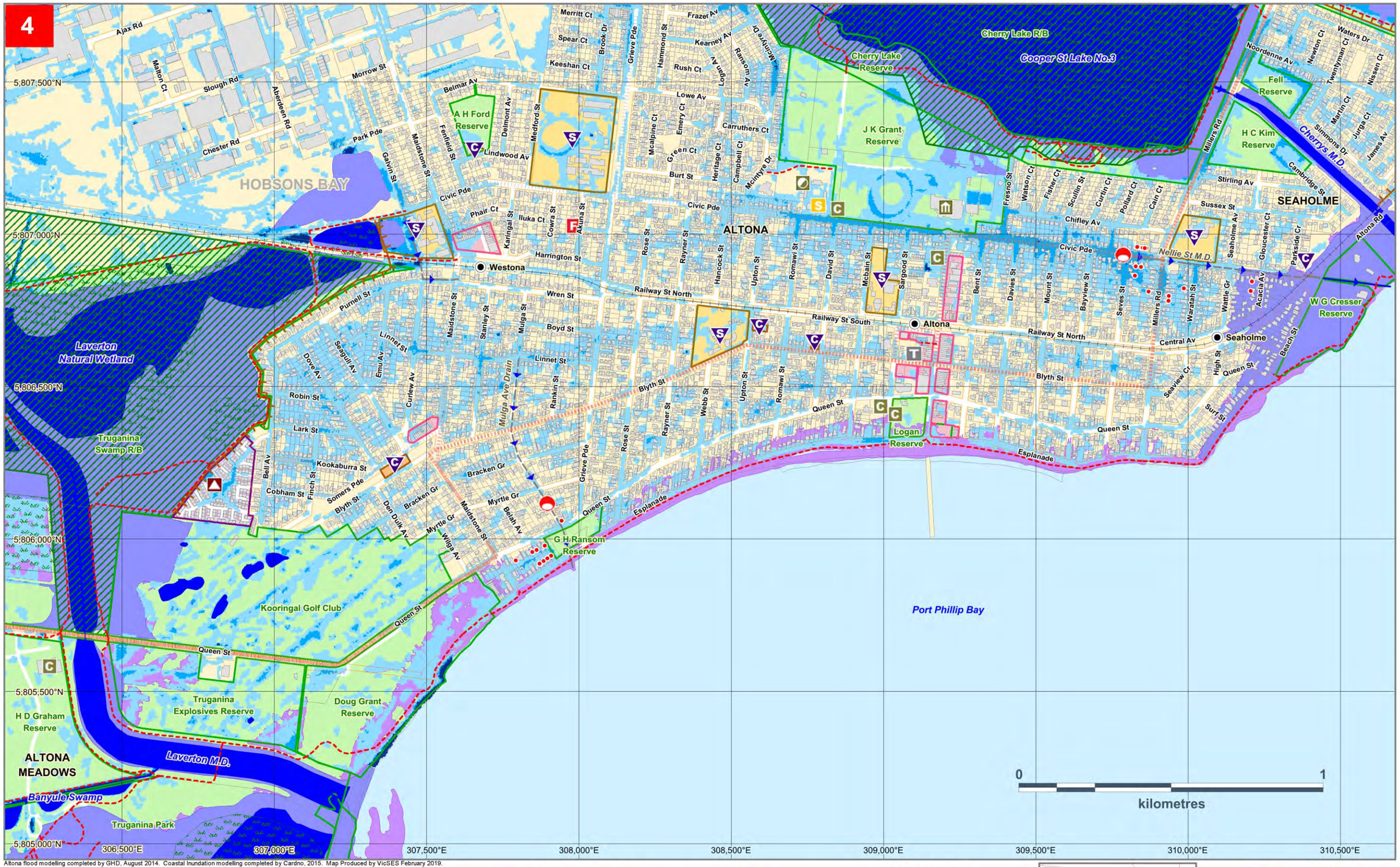
**3. Laverton Main Drain (Laverton)**

- Building
- Area of Interest
- Waterbody
- Shopping Precinct
- 1% AEP Storm Surge Extent (Depth Unknown)
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Bicycle / Walking Trail
- Bus Route (PTV)
- Melbourne Water Stormwater Drain
- Creek / Channel
- Natural Wetland
- Melbourne Water Retarding Baisn
- Levee
- Community Centre
- Police Station
- Place Of Worship
- Telephone Exchange
- Aged Care Facility
- Fire Station
- Kindergarten / Child Care
- School / College
- Sewer Emergency Relief Point
- Likely Road Closure Required
- Rain Gauge

**1% AEP Flash Flood Depth**

- Greater than 60cm
- Between 30cm to 60cm
- Up to 30cm


N




Altona flood modelling completed by GHD, August 2014. Coastal Inundation modelling completed by Cardno, 2015. Map Produced by VicSES February 2019.

## CITY OF HOBSONS BAY

1% AEP (100yr ARI) Flooding

**4. Altona Coastline (Altona)**

- Building
- Area of Interest
- Waterbody
- 1% AEP Storm Surge Extent
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Shopping Precinct
- Bicycle / Walking Trail
- Bus Route (PTV)
- Melbourne Water Stormwater Drain
- Creek / Channel
- Natural Wetland
- Melbourne Water Retarding Baisn
- Community Centre
- Municipal Depot
- Municipal Offices
- Telephone Exchange
- Aged Care Facility
- Fire Station
- Kindergarten / Child Care
- School / College
- Sewer Emergency Relief Point
- State Emergency Service Unit

**1% AEP Flash Flood Depth**

- Greater than 60cm
- Between 30cm to 60cm
- Up to 30cm


N

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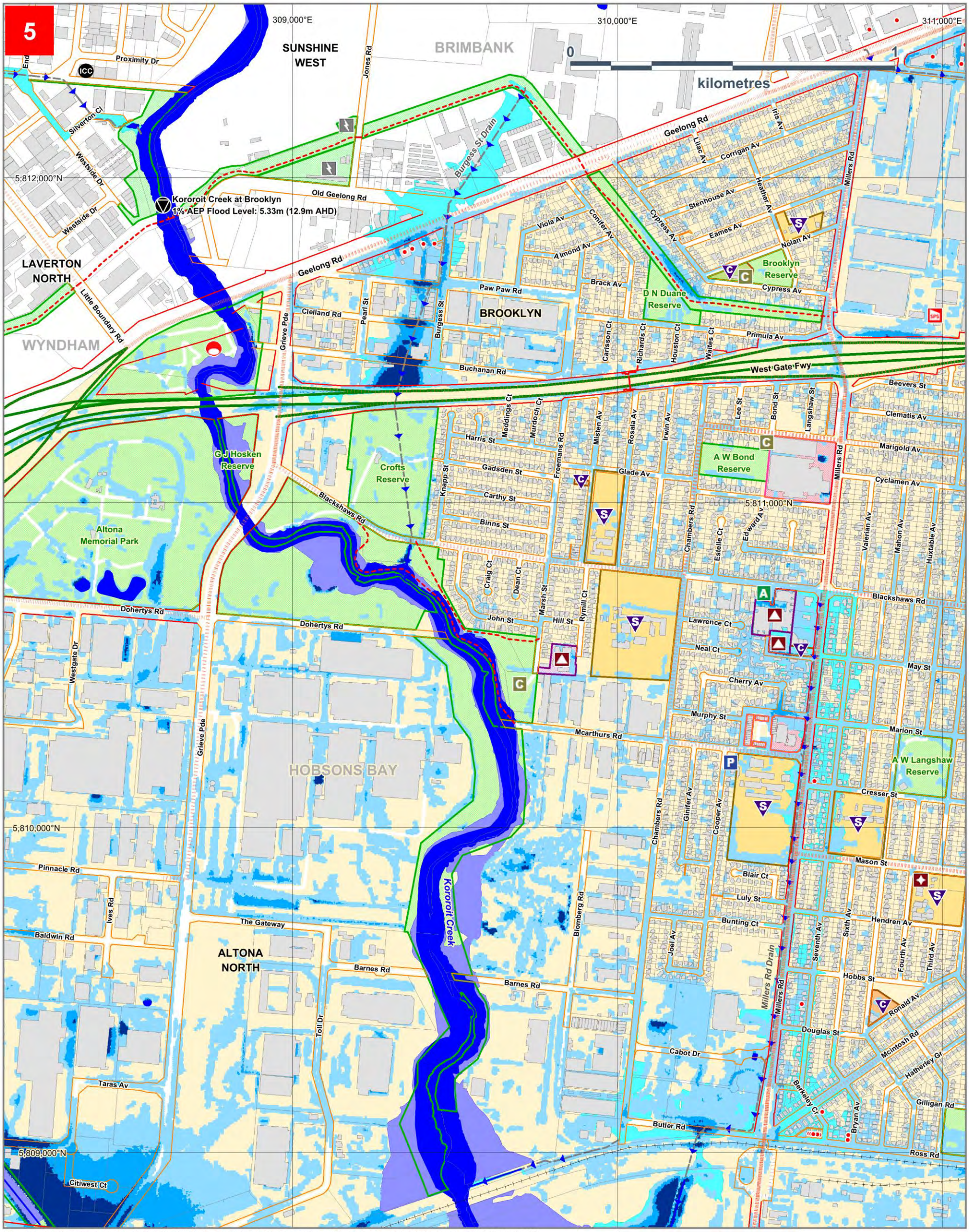


Millers Rd Drain flood modelling completed by CMPS&F Pty Ltd, April 1998. Kororoit Creek flood modelling completed by Melbourne Water, May 2011. Map Produced by VICSES February 2019.

# CITY OF PORT PHILLIP

1% AEP (100yr ARI) Flooding

**5. Kororoit Creek (Altona North)**

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6

308,000°E 308,500°E 309,000°E 309,500°E 310,000°E 310,500°E 311,000

5,808,500°N 5,808,000°N 5,807,500°N 5,807,000°N 5,806,500°N

ALTONA NORTH
HOBSONS BAY
ALTONA
SEAHOLME

Kororoit Creek Rd
Citiwest Ct
Grieve Pde
Toll Dr
Millers Rd Drain
Millers Rd
Cherrys M.D.
Aylesbury Dr
Kimpton Way
Drake Bvd
Kororoit Creek
Charles Rd
F Rush Reserve
Deavey Ct
Brook Dr
Hammond St
Kim Ct
Finley Rd
Chorley Av
McIntyre Dr
Merritt Ct
Frazer Av
Spear Ct
Kearney Av
Keeshan Ct
Rush Ct
Ransom Av
Logan Av
Cherry Lake R/B
Cooper St Lake No.3
Cherry Lake Reserve
J K Grant Reserve
Fell Reserve
H C Kim Reserve
W G Cresser Reserve
Port Phillip Bay
Belmar Av
Delmont Av
Medford St
Mcalpine Ct
Emery Ct
Green Ct
Heritage Ct
Campbell Ct
Carruthers Ct
Glenwood Av
Burt St
Civic Pde
Lindwood Av
Phair Ct
Iluka Ct
Cowra St
Fleming St
Harrington St
Westona
Rose St
Rayner St
Hancock St
Upton St
Romawi St
David St
Mcbain St
Sargood St
Pier St
Bent St
Davies St
Mount St
Bayview St
Seves St
Waratah St
Wattle Gr
Acacia Av
Railway St North
Railway St South
Wren St
Stanley St
Mulga St
Boyd St
Linnet St
Rankin St
Blyth St
Queen St
Altona
Seaholme
Central Av
Fresno St
Watson Ct
Fisher Ct
Scullin St
Curtin Ct
Pollard Ct
Cain Ct
Chifley Av
Stirling Av
Sussex St
Cambridge St
Seahorse Av
Gloucester Ct
Parkside Cr
Nellie St M.D.
Altona Rd
Miller Rd
Seaview Cr
High St
Esplanade
Beach St
Newton Ct
Twentyman Ct
Waters Dr
Nissen Ct
Moore Ct
Martin Ct
Jurga Ct
James Av
Noordenne Av
Simmons Dr

Building
Area of Interest
Waterbody
1% AEP Riverine Flood Extent (Depth Unavailable)
1% AEP Storm Surge Extent (Depth Unavailable)
Shopping Precinct
1% AEP Flash Flood Extent (Depth Unavailable)
Natural Wetland
Melbourne Water Retarding Basin
Levee
Creek / Waterway
Bicycle / Walking Trail
Bus Routes (PTV)
Melbourne Water Stormwater Drain
Kindergarten / Child Care
School / College
Community Centre
Municipal Offices
Municipal Depot
Telephone Exchange
Fire Station
Road Closure Likely
Sewer Emergency Relief Point
State Emergency Service Unit
Camping Ground
1% AEP Over-Floor Flooding Risk

**1% AEP Flash Flood Depth**

Greater than 60cm
Between 30cm to 60cm
Up to 30cm

HOBSONS BAY

N

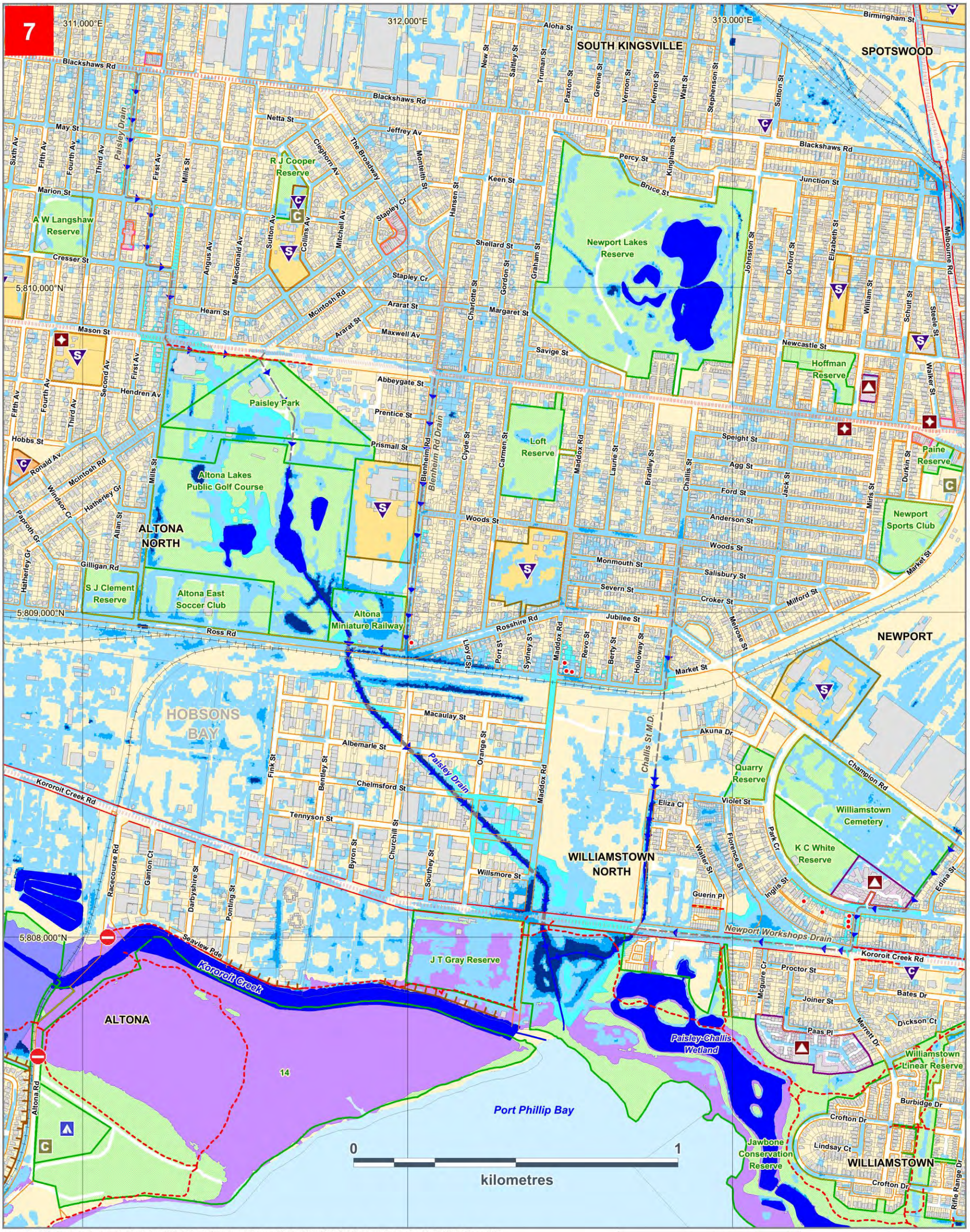
**CITY OF HOBSONS BAY**

1% AEP (100yr ARI) Flooding

**6. Cherrys Main Drain (Altona)**

0 500 metres

Cherrys Main Drain flood modelling completed by J Morgan, June 2008. Kororoit Creek flood modelling completed by Melbourne Water, May 2011. Map Produced by VicSES February 2019.




Coastal Inundation flood modelling completed by Cardno, 2015. Paisley Drain flood modelling completed by CMPS&F Pty Ltd, April 1998. Map Produced by VICSES February 2019.

- Building
- Waterbody
- Reserve / Park
- 1% AEP Flash Flood Extent (Depth Unavailable)
- 1% AEP Storm Surge Extent (Depth Unavailable)
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Shopping Precinct
- Melbourne Water Stormwater Drain
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Levee
- Place Of Worship
- Community Centre
- Aged Care Facility
- School / College
- Kindergarten / Child Care
- Road Closure Likely
- Camping Ground

**1% AEP Flash Flood Depth**

- Greater than 60cm
- Between 30cm to 60cm
- Up to 30cm

# CITY OF PORT PHILLIP

1% AEP (100yr ARI) Flooding

**7. Paisley Drain (Williamstown North)**


N

SES VICTORIA State Government Melbourne Water

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8

Altona flood modelling completed by GHD, August 2014. Coastal Inundation modelling completed by Cardno, 2015. Map Produced by VicSES February 2019.

# CITY OF HOBSONS BAY

1% AEP (100yr ARI) Flooding

**8. Stony Creek (Spotswood)**

Building
Area of Interest
Waterbody
Shopping Precinct
1% AEP Flash Flood Extent (Depth Unavailable)

Bicycle / Walking Trail
Bus Route (PTV)
Melbourne Water Stormwater Drain
Creek / Channel
Natural Wetland
1% AEP Over-Floor Flooding Risk

Community Centre
Telephone Exchange
Power Terminal Station
Place Of Worship
Aged Care Facility
Fire Station

Kindergarten / Child Care
School / College
Sewer Emergency Relief Point
Stream Level Gauge & 1% AEP Flood Level
Rain Gauge

**1% AEP Flood Depth**
Greater than 60cm
Between 30cm to 60cm
Up to 30cm


N

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9
MARIBYRNONG
Stony Creek at Spotswood
1% AEP Flood Level: 4.62m (5.44m AHD)
Stony Creek Reserve - Hyde Street
Hyde St
West Gate Fwy
Donald Mclean Reserve
Hall St
Stephen St
Bridge St
Stony Creek Park
Sabre Dr
Lorimer St
Wharf Rd
Mary Street Reserve
Mary St
The Avenue
Little Mary St
George St
Bolton St
Robert St
Forrest St
Hope St
Simcock Av
SPOTSWOOD
5,811,000°N
Hudsons Rd
Reed St
Edith Lane
Spotswood
Raleigh St
Robb St
Bernard St
Booker St
Scienceworks Museum
Mclister St
Macindoe Ct
Melbourne Rd
Mcneilage St
Ramsay St
Drake St
Douglas Pde
Westgate Park
West Gate Fwy
5,810,500°N
Blackshaws Rd
Junction St
William St
Schutt St
Mcrobert St
Ross St
Burleigh St Drain
Burleigh St
Yarra River
PORT MELBOURNE
MELBOURNE
HOBSONS BAY
5,810,000°N
High St
Britt Ct
Steele St
Digman Reserve
Hobson St
Riverside Park
Newcastle St
Walker St
River St
Home Rd
Farm St
Mason St
Newport
Elphin St
Douglas Pde
Newport Power Station
5,809,500°N
Tait St
Paine Reserve
Grindlay St
Brown St
Irving St
Eigin St
Rupert St
Derwent St
North Rd
The Strand
Miris St
Newport Sports Club
Davies St
Susman St
Rider Lane
Eliza St
Effingham Rd
Waltham Rd
Hastings Rd
Peel St
Melbourne Rd
Newport Park
Greenwich Reserve
Woods St
Market St
John Liston Dr
Wilkins St
Swan Ct
Holland Ct
NEWPORT
5,809,000°N
Thames Pl
Garnsworthy Pl
Paine St
Franklin St
Latrobe St
Crawford St
Alma Tce
Oakbank St
Bunbury St
Jackson Reserve
Yarra St
WILLIAMSTOWN
Douglas Pde
Power St
Douch St
Melbourne Rd
White St
Chandler St
Thomas St
Princes St
5,808,500°N
313,500°E
314,000°E
314,500°E
315,000°E
315,500°E
0
500
metres
N
HOBSONS BAY
SES
VICTORIA State Government
Melbourne Water
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Coastal Inundation flood modelling completed by Cardno, 2015. Map Produced by VICSES February 2019.
CITY OF PORT PHILLIP
1% AEP (100yr ARI) Flooding
9. Yarra River (Newport)
Building
Waterbody
Reserve / Park
1% AEP Flash Flood Extent (Depth Unavailable)
1% AEP Storm Surge Extent (Depth Unavailable)
1% AEP Flood Depth
Greater than 60cm
Between 30cm to 60cm
Up to 30cm
Melbourne Water Stormwater Drain
River / Creek
Bicycle / Walking Trail
Bus Route (PTV)
Sewer Emergency Relief Point
Place Of Worship
Community Centre
Telephone Exchange
Shopping Precinct
School / College
Kindergarten / Child Care
Fire Station
Aged Care Facility
Stream Level Gauge
Rain Gauge
Power Terminal Station
Natural Wetland

10

Williamstown Cemetery
Champion Rd
NEWPORT
K C White Reserve
WILLIAMSTOWN NORTH
Newport Workshops Drain
Park Cr
Inglis St
Florence St
Myrtle St
Adeline St
Lennon St
Courtis St
Melbourne Rd
Federal St
Power St
Freyer St
Pentland St
Station Rd
Nth Williamstown
Albert St
Union St
Russell Pl
Queen St
Douglas Pde
Dover Rd
Stanley St
Mariner St
John St
Hotham St
Hosking St
College St
Rennie St
Macquarie St
Hasiam St
The Strand
Clark St
Stevedore St
Maclean St
Alfred Pl
James St
Richard St
Lenore Cr
Jobson St
Kororoit Creek Rd
Proctor St
Mcguire Cr
Paas Pl
Joiner St
Merrett Dr
Bates Dr
Dickson Ct
Castle St
Collins St
Bayview St
Railway Pl
Victoria St
HOBSONS BAY
Dennis Reserve
Lyons St
Ferguson St
Electra St
Nelson Pl
Schutt Ct
Uren Ct
Williamstown Linear Reserve
Kokoda Rd
Winifred St
Charles St
Verdon St
Nancy Ct
Perry St
Melbourne Rd
Pasco St
Commonwealth Reserve
Williamstown RYCV
Cecil St
Aitken St
Lakeside Pl
Burbidge Dr
Anzac Cr
Knight St
Laverton St
Coogee Lane
Vulcan Gr
WILLIAMSTOWN
Parker St
Nelson Pl
Ann St
Jawbone Conservation Reserve
Lindsay Ct
Merrett Dr
Rifle Range Dr
Smith Av
Tobruk Cr
Crofton Dr
Sandpiper Pl
Osborne St
Williamstown Beach
Robertson Reserve
Colle St
Thompson St
Waterline Pl
Battery Rd
Gellibrand St
Stewart St
Forster St
Sands Pl
Langford St
Railway Cr
Hanmer St
Cecil St
Kanowna St
Bayview St
Hannan St
Victoria St
Vera St
Esplanade
Sadler Reserve
Garden St
Fearon Reserve
Williamstown Botanical Gardens
Gilfard St
Railway Pl
Railway Tce
Williamstown
Point Gellibrand Coastal Heritage Park
Gloucester Reserve
Cole St
Twyford St
Illawarra St
Thompson St
Smith St
Morris St
Cyril Curtain Reserve
Esplanade
Williamstown Cricket Ground
Port Phillip Bay
5,808,000°N
5,807,500°N
5,807,000°N
5,806,500°N
313,500°E
314,000°E
314,500°E
315,000°E
315,500°E
316,000°E
316,500°E
0
1
kilometres

Coastal Inundation modelling completed by Cardno, 2015. Map Produced by VicSES January 2019.

Building
Area of Interest
Waterbody
1% AEP Storm Surge Extent
Shopping Precinct
Bicycle / Walking Trail
Bus Route (PTV)
Melbourne Water Stormwater Drain
Creek / Channel
Natural Wetland
Community Centre
Place Of Worship
Police Station
Telephone Exchange
Aged Care Facility
Kindergarten / Child Care
School / College
Hospital
Tide Level Gauge
Retail Water Storage

**1% AEP Flash Flood Depth**
Greater than 60cm
Between 30cm to 60cm
Up to 30cm

HOBSONS BAY

N

SES VICTORIA State Government Melbourne Water



## CITY OF HOBSONS BAY

1% AEP (100yr ARI) Flooding

**10. Williamstown Coastline (Williamstown)**

# 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.

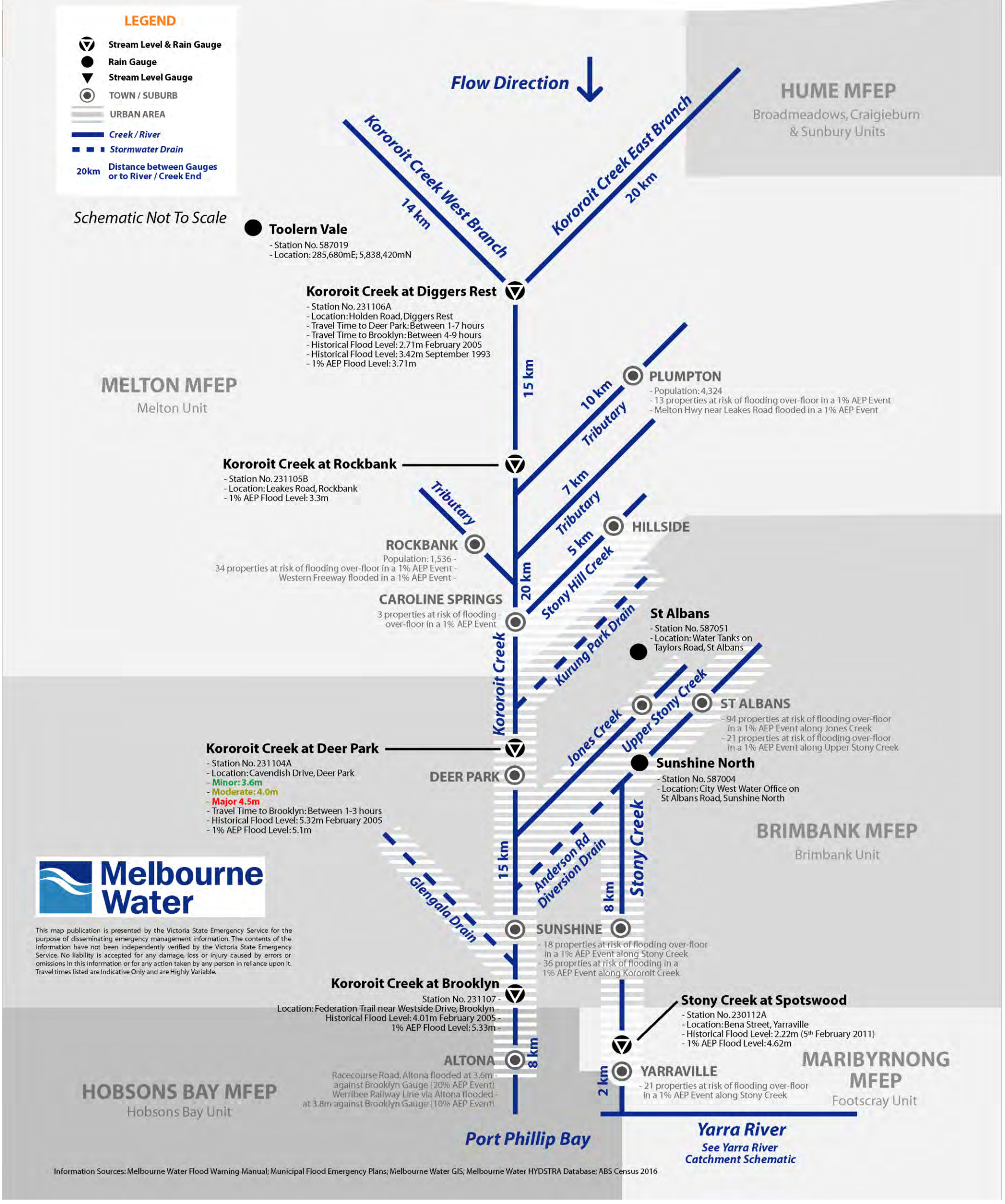
The schematics also detail the response boundaries for SES Units and local government, and provide a reference link to the corresponding Municipal Storm & Flood Emergency Plan.

Details within these Catchment Schematics reflect those contained within either other sections of this Municipal Storm & Flood Emergency Plan or refer to other Municipal Storm and/or 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.

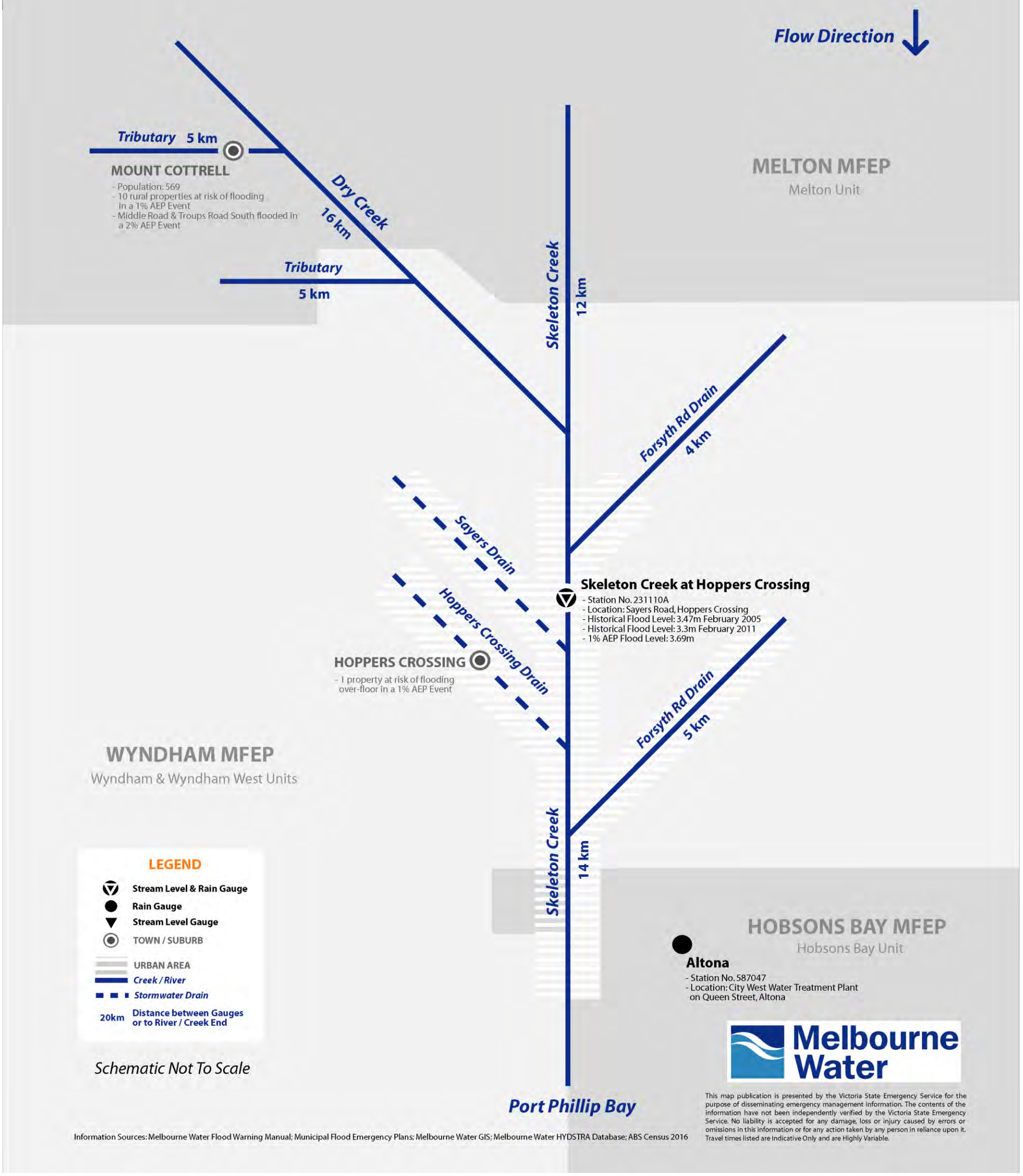
# Kororoit Creek & Stony Creek Catchment Schematic

Version 4 - February 2019



# Skeleton Creek Catchment Schematic

Version 4 - February 2019




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

Melbourne Water

# APPENDIX H – SEVERE WEATHER (STORM) EVENTS

## Overview

Hobsons Bay 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 Hobsons Bay may be subject to include wind storms, hailstorms, and thunderstorms (including lightning activity). There have also been occurrences of atmospheric downbursts/microburst within Hobsons Bay 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.

## 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 July 2009 and December 2018

| | VICSES Request for Assistance (July 2009 – December 2018) | | | | |
|---|---|---|---|---|---|
| Suburb | Building Damage | Flooding | Other* | Tree Down | Tree Down Traffic Hazard |
| ALTONA | 104 | 43 | 8 | 76 | 37 |
| ALTONA MEADOWS | 363 | 61 | 3 | 118 | 32 |
| ALTONA MEADOWS | 101 | 14 | 0 | 62 | 63 |
| BROOKLYN | 13 | 1 | 0 | 13 | 33 |
| LAVERTON | 71 | 8 | 1 | 57 | 30 |
| NEWPORT | 108 | 29 | 2 | 76 | 43 |
| SEABROOK | 48 | 4 | 0 | 25 | 10 |
| SEAHOLME | 8 | 5 | 0 | 16 | 9 |
| SOUTH KINGSVILLE | 17 | 1 | 0 | 15 | 9 |
| SPOTSWOOD | 14 | 3 | 6 | 20 | 11 |
| WILLIAMSTOWN | 115 | 24 | 4 | 74 | 36 |
| WILLIAMSTOWN NORTH | 10 | 5 | 1 | 13 | 5 |
| ALTONA | 104 | 43 | 8 | 76 | 37 |

Table H1 – Breakdown of severe weather RFAs received by VICSES Hobsons Bay Unit by suburb

* Loose Debris / Objects, Rescue Persons Trapped

| | VICSES Request for Assistance (July 2009 – December 2018) | | | | |
|---|---|---|---|---|---|
| Date | Building Damage | Flooding | Other* | Tree Down | Tree Down Traffic Hazard |
| July 2009 | 1 | 0 | 0 | 1 | 0 |
| August 2009 | 13 | 0 | 0 | 14 | 12 |
| September 2009 | 2 | 0 | 0 | 3 | 2 |
| October 2009 | 0 | 1 | 0 | 0 | 0 |
| November 2009 | 9 | 2 | 0 | 0 | 2 |
| December 2009 | 3 | 0 | 0 | 0 | 0 |
| January 2010 | 1 | 0 | 0 | 4 | 2 |
| February 2010 | 4 | 2 | 0 | 4 | 0 |

| Date | VICSES Request for Assistance (July 2009 – December 2018) | | | | |
|---|---|---|---|---|---|
| | Building Damage | Flooding | Other* | Tree Down | Tree Down Traffic Hazard |
| March 2010 | 5 | 1 | 0 | 1 | 1 |
| April 2010 | 5 | 0 | 0 | 1 | 0 |
| May 2010 | 1 | 0 | 0 | 0 | 0 |
| June 2010 | 0 | 0 | 0 | 4 | 1 |
| July 2010 | 2 | 0 | 0 | 0 | 0 |
| August 2010 | 3 | 0 | 0 | 5 | 2 |
| September 2010 | 10 | 1 | 0 | 13 | 6 |
| October 2010 | 9 | 2 | 1 | 0 | 1 |
| November 2010 | 6 | 0 | 0 | 3 | 4 |
| December 2010 | 10 | 7 | 0 | 2 | 4 |
| January 2011 | 11 | 3 | 3 | 5 | 1 |
| February 2011 | 83 | 91 | 2 | 39 | 14 |
| March 2011 | 2 | 0 | 0 | 2 | 1 |
| April 2011 | 4 | 3 | 0 | 1 | 2 |
| May 2011 | 1 | 0 | 0 | 2 | 1 |
| June 2011 | 0 | 0 | 0 | 2 | 0 |
| July 2011 | 2 | 0 | 0 | 2 | 0 |
| August 2011 | 0 | 0 | 0 | 0 | 2 |
| September 2011 | 10 | 1 | 0 | 5 | 4 |
| October 2011 | 3 | 0 | 0 | 2 | 2 |
| November 2011 | 8 | 1 | 2 | 1 | 3 |
| December 2011 | 11 | 3 | 0 | 1 | 2 |
| January 2012 | 8 | 0 | 0 | 11 | 1 |
| February 2012 | 6 | 0 | 0 | 14 | 10 |
| March 2012 | 2 | 0 | 0 | 1 | 3 |
| April 2012 | 4 | 0 | 0 | 5 | 3 |
| May 2012 | 1 | 1 | 0 | 1 | 2 |
| June 2012 | 1 | 0 | 0 | 1 | 0 |
| July 2012 | 2 | 0 | 0 | 1 | 0 |
| August 2012 | 0 | 1 | 1 | 1 | 1 |
| September 2012 | 9 | 0 | 0 | 9 | 1 |
| October 2012 | 0 | 0 | 0 | 0 | 2 |
| November 2012 | 2 | 0 | 0 | 1 | 2 |
| December 2012 | 2 | 0 | 0 | 11 | 7 |
| January 2013 | 4 | 0 | 0 | 1 | 2 |
| February 2013 | 0 | 0 | 0 | 1 | 2 |
| March 2013 | 10 | 0 | 0 | 18 | 3 |
| April 3013 | 1 | 1 | 0 | 0 | 0 |
| May 2013 | 1 | 0 | 0 | 0 | 0 |
| June 2013 | 4 | 0 | 0 | 0 | 2 |
| July 2013 | 1 | 0 | 0 | 0 | 1 |
| August 2013 | 12 | 0 | 0 | 20 | 6 |
| September 2013 | 5 | 0 | 0 | 8 | 4 |
| October 2013 | 179 | 0 | 0 | 121 | 39 |
| November 2013 | 6 | 0 | 0 | 1 | 1 |
| December 2013 | 1 | 0 | 0 | 2 | 3 |
| January 2014 | 7 | 0 | 0 | 2 | 5 |
| February 2014 | 1 | 0 | 0 | 5 | 2 |
| March 2014 | 10 | 2 | 0 | 4 | 5 |
| April 2014 | 5 | 0 | 0 | 1 | 0 |
| May 2014 | 0 | 0 | 0 | 0 | 0 |
| June 2014 | 25 | 4 | 0 | 8 | 8 |
| July 2014 | 3 | 0 | 0 | 4 | 0 |
| August 2014 | 4 | 0 | 0 | 0 | 0 |
| September 2014 | 6 | 0 | 0 | 3 | 2 |
| October 2014 | 3 | 0 | 0 | 3 | 0 |
| November 2014 | 6 | 1 | 0 | 2 | 0 |

| Date | VICSES Request for Assistance (July 2009 – December 2018) | | | | |
|---|---|---|---|---|---|
| | Building Damage | Flooding | Other* | Tree Down | Tree Down Traffic Hazard |
| December 2014 | 5 | 0 | 0 | 11 | 10 |
| January 2015 | 1 | 0 | 0 | 8 | 4 |
| February 2015 | 1 | 1 | 0 | 6 | 1 |
| March 2015 | 2 | 0 | 0 | 7 | 2 |
| April 2015 | 1 | 0 | 0 | 1 | 1 |
| May 2015 | 1 | 0 | 0 | 0 | 0 |
| June 2015 | 2 | 0 | 0 | 0 | 1 |
| July 2015 | 1 | 0 | 0 | 0 | 0 |
| August 2015 | 0 | 0 | 0 | 0 | 2 |
| September 2015 | 1 | 1 | 0 | 3 | 0 |
| October 2015 | 2 | 0 | 0 | 3 | 2 |
| November 2015 | 8 | 2 | 0 | 9 | 8 |
| December 2015 | 3 | 1 | 0 | 2 | 3 |
| January 2016 | 23 | 4 | 0 | 4 | 4 |
| February 2016 | 0 | 0 | 0 | 2 | 0 |
| March 2016 | 3 | 0 | 0 | 2 | 1 |
| April 2016 | 1 | 0 | 0 | 0 | 0 |
| May 2016 | 3 | 0 | 0 | 4 | 1 |
| June 2016 | 0 | 0 | 0 | 0 | 0 |
| July 2016 | 3 | 1 | 0 | 8 | 1 |
| August 2016 | 0 | 1 | 0 | 0 | 0 |
| September 2016 | 2 | 4 | 1 | 1 | 1 |
| October 2016 | 85 | 0 | 0 | 52 | 38 |
| November 2016 | 132 | 0 | 0 | 10 | 8 |
| December 2016 | 21 | 4 | 0 | 4 | 2 |
| January 2017 | 2 | 0 | 0 | 1 | 1 |
| February 2017 | 3 | 3 | 0 | 4 | 1 |
| March 2017 | 5 | 0 | 0 | 1 | 2 |
| April 2017 | 8 | 0 | 0 | 2 | 0 |
| May 2017 | 1 | 0 | 0 | 0 | 1 |
| June 2017 | 0 | 0 | 0 | 0 | 0 |
| July 2017 | 17 | 0 | 0 | 10 | 17 |
| August 2017 | 7 | 0 | 0 | 3 | 1 |
| September 2017 | 3 | 0 | 0 | 0 | 1 |
| October 2017 | 1 | 0 | 0 | 0 | 0 |
| November 2017 | 5 | 2 | 0 | 3 | 3 |
| December 2017 | 17 | 4 | 2 | 1 | 4 |
| January 2018 | 1 | 1 | 0 | 1 | 1 |
| February 2018 | 6 | 0 | 0 | 7 | 5 |
| March 2018 | 3 | 0 | 0 | 6 | 1 |
| April 2018 | 1 | 0 | 0 | 2 | 0 |
| May 2018 | 4 | 0 | 0 | 2 | 1 |
| June 2018 | 3 | 0 | 0 | 1 | 0 |
| July 2018 | 4 | 0 | 0 | 1 | 3 |
| August 2018 | 0 | 0 | 0 | 1 | 0 |
| September 2018 | 3 | 0 | 0 | 0 | 1 |
| October 2018 | 3 | 0 | 0 | 0 | 0 |
| November 2018 | 2 | 3 | 6 | 4 | 1 |
| December 2018 | 22 | 38 | 7 | 1 | 0 |

Table H2 – Breakdown of severe weather RFAs received by VICSES Hobsons Bay Unit by date

* Loose Debris / Objects, Rescue Persons Trapped

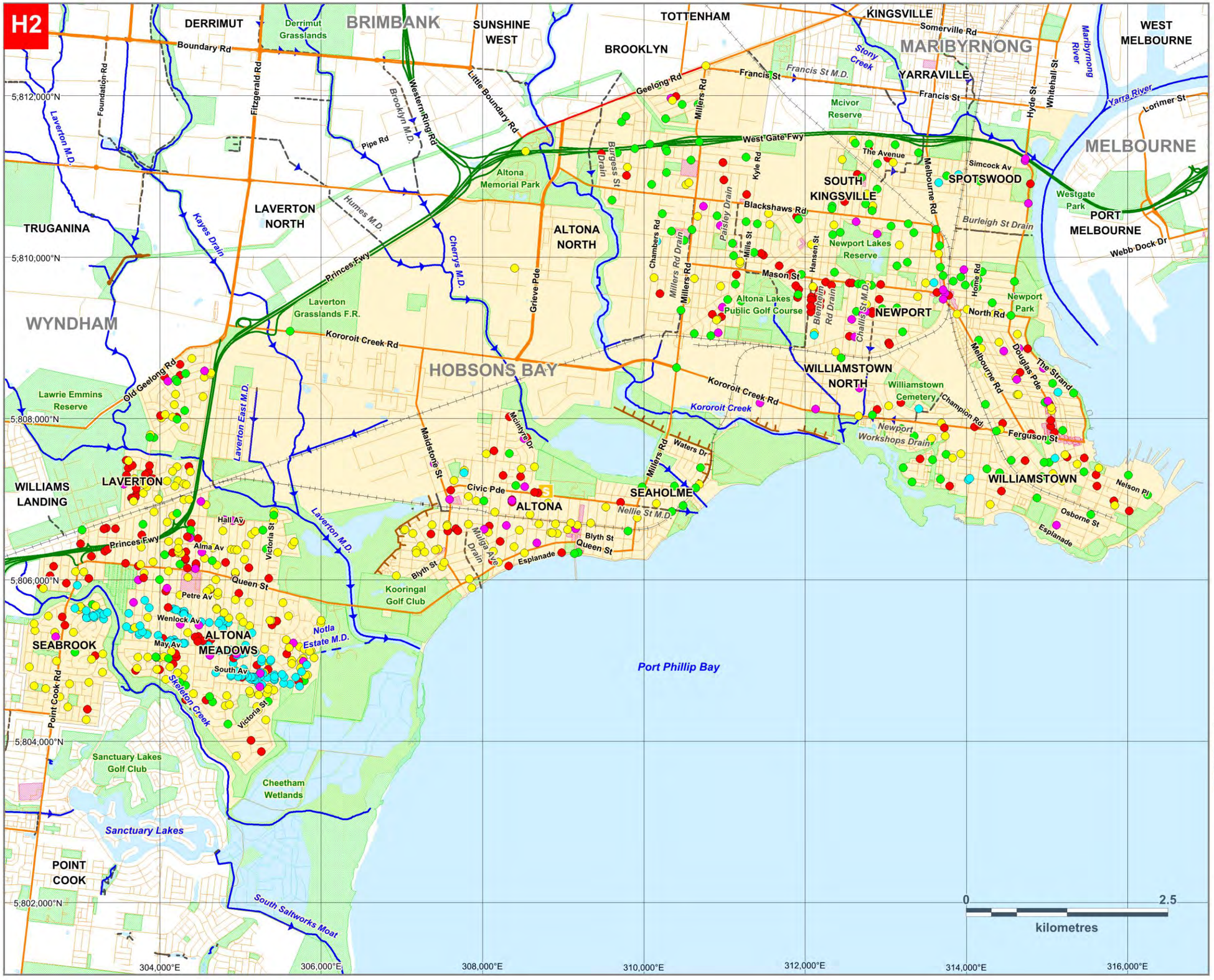
## Large Storm Events

Typically Hobsons Bay Unit would expect to be impacted by a large storm event per year (more than 40 RFA's per day).

Since 2010 the following larger storm events have occurred in the Hobsons Bay area:

- 5th & 6th February 2011 – Rain and storm event that saw **195 RFA's** received mainly for flash flooding and storm damage.
- 10th & 11th February 2011 – Windstorm event that saw **43 RFA's** received
- 1st and 2nd December 2013 – Windstorm event which saw **291 RFA's** received
- 24th & 25th June 2014 – Windstorm / minor flash flooding event which saw **45 RFA's** received
- 9th & 10th October 2016 – Windstorm Event which saw **150 RFA's** received
- 21st & 22nd November 2016 – Windstorm event which saw **150 RFA's** received
- 13th & 14th December 2018 – Thunderstorm which saw **68 RFA's** received

## VICSES Requests for Assistance (Severe Weather) Mapping




# CITY OF HOBSONS BAY

Version 3: February 2019

**H2 - Severe Weather Request for Assistance (RFA) Recieved by Date (Jul 2009 - Dec 2018)**