Mount Alexander Shire

FLOOD EMERGENCY PLAN

A Sub-Plan of the Municipal Emergency Management Plan

For Mount Alexander Shire Council
and
VICSES Unit Castlemaine

Version 2, July 2019

MOUNT ALEXANDER SHIRE COUNCIL

VICTORIA State Government

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Distribution of MFEP

Once endorsed and signed the, MFEP should be distributed to all MFEP committee members, MEMPC Chair, council, MERO, Deputy MERO, Representatives from; BoM, CMA, DELWP, Parks Victoria, Ambulance Victoria, VicRoads, DHHS, relevant utilities, MFB, MERC, RERC, Police station, VICSES Units, VICSES Regional office, CFA Brigades, CFA Regional office,

Document Transmittal Form / Amendment Certificate

This Municipal Flood Emergency Plan (MFEP) will be amended, maintained and distributed as required or every 3 years facilitated by VICSES in consultation with the Municipal Emergency Management Planning Committee (MEMPC)

Suggestions for amendments to this Plan should be forwarded to VICSES Regional Office via the North West MROEM and ROEM's located in the VICSES Bendigo office (7 Rohs Road).

Amendments listed below have been included in this Plan and updated as a new version.

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
V1	10/9/2018	Clare Mintern	Update to incorporate Castlemaine, Campbells Bridge Flood Study and recent flood event data.
V2	July 2019	VICSES	Version 2 created adopting new template and updated data (amended to include sandbag collection points).

This Plan will be maintained on the VICSES website at www.ses.vic.gov.au/get-ready/your-local-flood-information and the Mount Alexander Shire website

List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan			
AAR	After Action Review	**GMW**	Goulburn Murray Water
AEP	Annual Exceedance Probability	**IIA**	Initial Impact Assessment
AHD	Australian Height Datum (the height of a location above mean sea level in metres)	**IEMT**	Incident Emergency Management Team
AIDR	Australian Institute of Disaster Resilience	**JSOP**	Joint Standard Operations Procedure
AIIMS	Australasian Inter-service Incident Management System	**IMS**	Incident Management System
AoCC	Area of Operations Control Centre / Command Centre	**LSIO**	Land Subject to Inundation Overlay
ARI	Average Recurrence Interval	**MEMO**	Municipal Emergency Management Officer
ARMCANZ	Agricultural & Resource Management Council of Australia & New Zealand	**MEMP**	Municipal Emergency Management Plan
AV	Ambulance Victoria	**MEMPC**	Municipal Emergency Management Planning Committee
BoM	Bureau of Meteorology	**MERC**	Municipal Emergency Response Coordinator
CEO	Chief Executive Officer	**MERO**	Municipal Emergency Resource Officer
CERA	Community Emergency Risk Assessment	**MFB**	Metropolitan Fire Brigade
CFA	Country Fire Authority	**MFEP**	Municipal Flood Emergency Plan
CMA	Catchment Management Authority	**MFEPC**	Municipal Flood Emergency Planning Committee
RERC	Regional Emergency Response Coordinator	**MRM**	Municipal Recovery Manager
RERCC	Regional Emergency Response Coordination Centre	**PMF**	Probable Maximum Flood
DHHS	Department of Health and Human Services	**RAC**	Regional Agency Commander
DEDJTR	Department of Economic Development, Jobs, Transport, Resources	**RCC**	Regional Control Centre
DELWP	Department of Environment, Land, Water and Planning	**RDO**	Regional Duty Officer
EMLO	Emergency Management Liaison Officer	**SAC**	State Agency Commander
EMMV	Emergency Management Manual Victoria	**SBO**	Special Building Overlay
EMT	Emergency Management Team	**SCC**	State Control Centre
ERC	Emergency Relief Centre	**SDO**	State Duty Officer
EO	Executive Officer	**SERP**	State Emergency Response Plan
FO	Floodway Overlay	**SEWS**	Standard Emergency Warning Signal

Part 1. Introduction

1.1 Approval and Endorsement

This Municipal Flood Emergency Plan (MFEP) has been prepared by the Mount Alexander Municipal Flood Planning Committee (MFPC) and with the authority of the Integrated Municipal Emergency Management Planning Committee (IMEMPC) pursuant to Section 20 of the Emergency Management Act 1986 (as amended).

The Mount Alexander shire MFPC have undertaken the following consultations with their community/communities about the arrangements contained within this plan.

This MFEP is a sub plan to the Mount Alexander Shire Emergency Management Plan (MEMP), is consistent with the Emergency Management Manual Victoria (EMMV) and the Victorian Floodplain Management Strategy (2016), and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC).

The MFEP is consistent with the Regional Flood Emergency Plan (RFEP) and the State Emergency Response Plan (SERP) – Flood sub-plan.

This MFEP is a result of the cooperative efforts of the MFPC and its member agencies.

This Plan is approved by the VICSES Regional Manager.

This Plan is endorsed by the Mount Alexander Shire MEMPC as a sub-plan to the MEMP.

Approval

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Mark Cattell Date

North West Region VICSES Regional Manager

Endorsement

……..

Lisa Knight (Mt. Alexander) Date

Chair – Integrated Municipal Emergency Management Planning Committee

1.2 Purpose and Scope of this Flood Emergency Plan

The purpose of this MFEP is to detail arrangements agreed for the managing a flood emergency before, during and after it occurs or potentially occurs within the Mount Alexander Shire.

As such, the scope of the Plan is to:

- Identify the local flood risk;
- Support the implementation of mitigation and planning measures to minimise the causes and impacts of flooding;
- Detail emergency management arrangements;
- Identify linkages with Local, Regional and State emergency and wider planning arrangements with a specific emphasis on those relevant to flood.

1.3 Municipal Flood Planning Committee (MFPC)

Membership of the Mount Alexander Shire Flood Planning Committee (MFPC) comprises of the following representatives from the following agencies and organisations:

- VICSES Regional Officer – Emergency Management (Chair),
- VICSES Castlemaine Unit – Controller or Deputy Controllers (2)
- Mount Alexander Shire Council
- Victoria Police (MERC),
- CFA Group Officers – Mt Alexander Grp, Strathloddon Grp.,
- Goulburn Murray Water – Cairn Curran Res. Manager
- Castlemaine Health
- North Central Catchment Management Authority (as required),
- Department of Health & Human Services (DHHS) as required,
- Department of Environment Land, Water and Planning (DELWP) as required,
- Bureau of Meteorology as required,
- Coliban Water,
- Local community representatives and
- Other agencies as required

1.4 Responsibility for Planning, Review & Maintenance of this Plan

This MFEP must be maintained in order to remain effective.

VICSES through the MFPC has responsibility for facilitating the preparation, review, maintenance and distribution of this plan.

The MFPC will meet at least once per year. The plan should be reviewed following:

- A new flood study;
- A significant change in flood mitigation measures;
- After the occurrence of a significant flood event within the Municipality;
- Or if none of the above occur, every 3 years.

Part 2. Prevention / preparedness arrangements

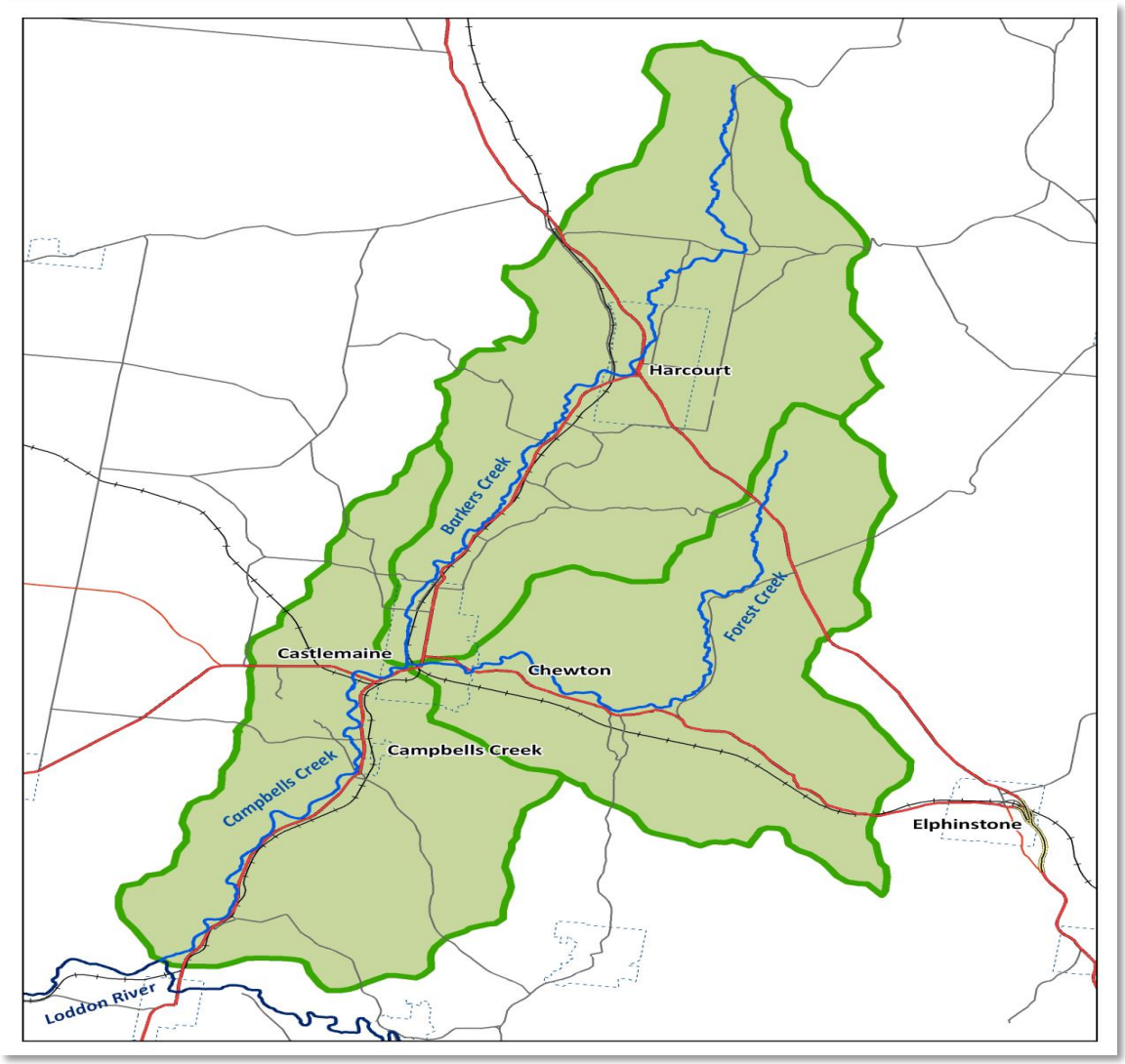
2.1 Community Engagement and Awareness

Details of this MFEP will be released to the community through; local media, any FloodSafe engagement initiatives and websites (VICSES and the Municipality) upon formal adoption by VICSES and the Municipality

VICSES with the support of the Mount Alexander Shire and the North Central CMA will coordinate targeted community flood engagement programs within the council area.

A Community Engagement/Communication Plan has been developed in addition to any Local Flood Guides. Refer to appendix H (LFG and FloodSafe Information).

Mount Alexander Shire is located in central Victoria, about 120 kilometers north-west of Melbourne. The Mount Alexander Shire is located between the City of Ballarat and the City of Greater Bendigo and situated in a valley at the junction of three Creek's being Barkers, Forest and Campbell's.



The Shire encompasses a total land area of about 1,530 square kilometres. Land is used largely for farming, grazing and fruit growing. The Shire's infrastructure is vital to its future. Water is provided by Coliban Water and is sourced from the Loddon and Campaspe river systems which have relatively small storages with large demands. Water security for the region will have a major impact on development and the capacity to meet current and future needs of the Shires residents and businesses.

2.2 Structural Flood Mitigation Measures

The following summary of structural flood mitigation measures exist within the Council area:

- The township of Newstead has a levee bank built in 1912 to protect the town; this levee bank has managed to save the town from severe flooding at least several times since it was built. There is no formal agreement for who is responsible for the levee system; however the Mount Alexander Shire Council will undertake maintenance on the levee bank when required or after a flood event. The houses in Newstead have water levels indicated on them to guide the water height levels in a flood event.

Council are aware of a number of levee banks that have been established within the municipality. There is very limited information on the original construction of these levee's. As a general rule, Council monitor and undertake minimal maintenance works to the following levee banks:

- Newstead Levee Bank (Loddon River)
- Campbell's Creek Levee Bank (Barkers Creek)
- Castlemaine Levee Bank (Forest Creek)
- Baringhup Levee Bank (Murphy's Road)
- Sutton Grange Levee Bank (Carnogan's Road)
- Yapeen Levee Bank (Bakery Lane)

Refer to appendix C for detailed information of structural flood mitigation measures.

2.3 Flood Intelligence

Flood intelligence describes flood behaviour and its effects on the community. The effects include:

- Inundation (which may lead to a need for evacuation and/or property protection).
- Isolation (creating a need for resupply and/or rescue).
- Disruption to community activities (e.g. road closures)

Flood intelligence is obtained by the process of gathering and assessing information for the purpose of estimating the likely impacts and consequences of pending and future floods. It is used to facilitate operational decision-making and the provision of warnings and information to agencies and the public.

VICSES develops and maintains a flood intelligence system for the municipal footprint, including; records of the effects of flooding at different heights. Information about accessing flood intelligence is contained in Appendix C.

2.4 Flood Warning Services

All Victorian communities receive weather-related warnings such as Flood Watches and Severe Weather Warnings delivered by BoM. These services provide advice on weather conditions that have the potential for heavy rainfall and flooding.

BoM's website also provides near real-time river height data and rainfall data, for most major rivers at risk of flooding. This information allows people to make their own judgements about the rates of change and the potential for local consequences during a flood.

VICSES issues Local Flood Guides to support local communities in preparing for and responding to floods.

Victoria also has a flood warning system that involves several elements: rainfall and stream flow gauging, mapping, warnings and predictions. All these elements need to come together in order for the total system to give communities effectively warnings about approaching floods.

Victoria's flood warning system is called the Total Flood Warning System (TFWS).

2.4.1 Total Flood Warning System Services

The purpose of the Total Flood Warning System (TFWS) is to enable and persuade people, communities and organisations to take action to increase safety and reduce the costs of flooding. It seeks to achieve this by generating appropriate responses from people and organisations at risk, and from the agencies with responsibilities during flood times.[1]

The TFWS comprises of six integral parts[2]:

1. **Prediction** – detecting changes in the environment that lead to flooding, and predicting river levels during flood[3].
2. **Interpretation** – identifying in advance the impacts of the predicted flood levels on communities at risk.
3. **Message construction** – devising the content of the message which will warn people of impending flooding.
4. **Communication** – disseminating warning information in a timely fashion to people and organisations likely to be affected by the flood.
5. **Response** – generating appropriate and timely actions from the threatened community and from the agencies involved.
6. **Review** – examining the various aspects of the system with a view to improving its performance.

Communities with high potential for flood damage receive more sophisticated TFWS services. These can include local predictions about the rise and fall of floodwaters, details on the roads and properties likely to be inundated, and local advice about how to prepare for and respond to predicted floods.

2.4.2 Clarifying accountabilities for each TFWS element

The relevant agencies' roles and responsibilities in operating and maintaining the TFWS is as follows:

Data collection network infrastructure: The river height and rainfall gauging network infrastructure is maintained through Regional Water Monitoring Partnership (involving DELWP, Council, CMAs, and local water corporations). The Partnership contributes funds to the maintenance of those parts of the network whose primary function is to support the TFWS.

Flood prediction service maintenance: BoM maintains and funds the prediction services for the locations as defined in the Partnership agreement. Maintenance includes continually improving

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[1] Mary Barry, *Total flood warning systems*, The Australian Journal of Emergency Management, Vol.23 No. 3, August 2008

[2] Ibid

[3] Note: This Plan acknowledges that not all river systems are serviced by flood monitoring gauges. As part of flood studies future monitoring infrastructure could be determined.

prediction techniques, interpretation (flood mapping) and completion of local flood studies to produce updated flood mapping. DELWP includes updated flood mapping and flood behaviour information into the flood intelligence platform.

Message construction and dissemination: BoM maintain appropriate flood warning messages and associated dissemination channels. VICSES maintains its dissemination channels for flood bulletins. DELWP maintains the flood intelligence platform to enable appropriate information for messages and bulletins to be accessed. Council may relay approved messages from the BoM and VICSES on its website and social media.

Flood response planning and community awareness: VICSES maintains flood response plans and community education material. CMAs supply VICSES with any significant updates.

2.4.3 FloodZoom

DELWP has developed a ground-breaking, web-based tool that provides an authoritative range of flood information to agencies, before, during and after floods – all in the one resource.

FloodZoom brings together flood forecasts, flood mapping, real-time river height gauges and property data to provide flood response agencies with improved knowledge of likely flood impacts.

Flood-prone communities will benefit from more accurate and timely flood warnings that are specific to their local community, improved flood preparedness and flood response activities, and better informed planning decisions.

For further details go to Link: Flood warning improvements - DELWP

Floodzoom can be accessed by DELWP, CMA & VICSES: Click Here

2.4.4 VicEmergency Website

Emergency Management Victoria (EMV) host the VicEmergency Website, a centralised website for Victorians to find emergency information and warnings. You can also access preparedness and recovery information related to emergencies.

The website has a real-time Google Map display with incidents across the state including floods, storms, fires, earthquakes, tsunami, beach closures, shark sightings and more.

2.5 Flash flood warning services

Flash flooding poses a potential threat to life in some regional urban centres. Flash flood warnings centre on a rapid response (less than six hours) to the conditions that might lead to flooding:

- NCCMA, with support from VICSES and Council, identify areas where flash flooding poses a risk to life.
- VICSES will work with DELWP, BoM, and the Emergency Management Victoria to evaluate the potential to provide localised neighbourhood-scale flash flood warning services where there is a history of flash flooding.

2.6 Non-structural Flood Mitigation Measures

2.6.1 Exercising the Plan

Arrangements for exercising this Plan will be at the discretion of the MEMPC. It is recommended that the MFEP is exercised on annual basis and reviewed in line with Section 1.4.

2.6.2 Flood Warning

Arrangements for Bureau issued Flood Watch and Flood Warning products are contained within the SERP Sub Plan – Flood (www.ses.vic.gov.au/em-sector/vicses-emergency-plans) and on the Bureau of Meteorology (BoM) website www.bom.gov.au.

There are no gauging stations either on Campbell's Creek, Barker's Creek or Forest Creek currently listed on the Bureau of Meteorology (BoM) website, therefore, the BoM does not have the capability to provide flood predictions in its role as the lead agency for providing flood predictions. As a result of the lack of infrastructure Castlemaine, Campbell's Creek and Chewton receive limited flood warning advice and only of a general nature as flash flooding generally limits the available time for adequate and accurate predictions of flood impact.

Details on Warnings issued by VICSES through VicEmergency and VICSES channels are outlined in section 3.4 with specific details of local flood warning system arrangements provided in **Appendix E**.

2.6.3 Local Knowledge

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

Part 3. Response arrangements

3.1 Introduction

3.1.1 Activation of Response

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

The VICSES Incident Controller (IC)/RDO will activate agencies as required as documented in the State Emergency Response Plan - Flood.

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 flood within the Mount Alexander Shire. These agencies will be engaged through the EMT.

The general roles and responsibilities of supporting agencies are as agreed within the: MEMP, EMMV (Part 7 'Emergency Management Agency Roles') and SERP Sub Plan - Flood and Regional Flood Emergency Plan.

Some specific flood support roles are expanded upon in Table 1 below. The extent of their implementation will depend on the severity of the flooding.

VICSES ensures that all agencies and organisations mentioned in Table 1 are aware of their roles and responsibilities.

Table 1. Emergency Management Roles and Responsibilities for Flood

Agency/ Communities'	Specific "Flood" Responsibilities	Web links and Comments
Ambulance Victoria (AV)	• Support the evacuation of vulnerable people. • Support other agencies.	
Bureau of Meteorology BOM	• Key Support Agency for flood. • Contribute to community awareness of meteorological and hydrological phenomena and warning systems • Provide meteorological forecasts and advice, including Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings. • Flood monitoring and prediction, this involves: ○ meteorological input, ○ collecting data from rainfall and stream flow data networks, ○ operating flood prediction models, ○ preparing and issuing warnings to key agencies and selected media.	Bureau of Meteorology
Country Fire Authority	• Support Agency for flood, supporting VICSES in their response role i.e. provision of personnel. • Aircraft Support: Management of airbases and	

Agency/ Communities'	Specific "Flood" Responsibilities	Web links and Comments
CFA	provision of air observers. • Provide assistance, advice and information to other agencies responsible for, or involved in recovery activities.	
Communities - Residential & commercial property owners'	• Take an active interest in ensuring that their property and contents are insured and that their insurance premiums are tailored to their flood risk. • Residents and business owners in potentially flood prone areas should: ○ Understand their flood risk, ○ Prepare a flood emergency plan for their home or business and put in place effective measures to mitigate flood impact for their dwellings and business premises, and to aid in flood recovery, ○ Where physically capable fill and move sandbags to protect their property. As a guide 25 sandbags is a reasonable supply to residents to allow for coverage of doorways, blocking vents, drains and toilets. Additional sandbags may be provided taking into consideration individual issues and local priorities. ○ Following advice from Council regarding the disposal of sandbags from their property, as part of the clean-up. • Landholders may clear vegetation from waterways using a licence from the NCCMA, depending on the area.	Emergency Plans and Kits — Victoria State Emergency Service VICSES has an established community education program to support community and business in responding to flood emergencies Links: FloodSafe — Victoria State Emergency Service Your local flood information — Victoria State Emergency Service
Community - Critical Facility owners'	• Working with VICSES to develop an effective flood mitigation plan for their property.	
Department of Economics, Development, Jobs, Transport and Resources DEDJTR	• Provide advice on animal welfare and dealing with dead and injured animals. • With the support of participating and supporting organisations i.e. Council, provide animal care services for pets and companion animals of evacuees.	
Department of Environment, Land, Water and Planning DELWP	• Key Support Agency for flood. • Coordination of Total Flood Warming System (TFWS) services at the state level in consultation with VICSES, BoM, NCCMA, Council and Coliban Water. • Dam Safety management. • Flood mapping: Coordinates the statewide flood database, collates flood height and extent mapping data across the state. The data is captured and developed through a number of flood risk assessment investigations and studies. The information is stored as a series of Geographic Information System (GIS) layers, collectively known as the Victorian Flood Database (VFD). • Assists Council to manage floodplains and implement mitigation works to reduce the risk of flooding.	DELWP - Floodplain management

Agency/ Communities'	Specific "Flood" Responsibilities	Web links and Comments
	• Facilitates the management of levee systems and the oversight of flood warning systems. • Aircraft Support: Management of airbases and provision of air observers. • Environmental impact assessment following a significant flood.	
Parks Victoria PV	• Support the flood response and recovery actions, including IMT's, field operations, reopening of roads and bridges on PV land, and management of park visitors. • Management of any water control structures located on PV land. • Clearing and restoration of roads, bridges and other assets within its parks and reserves. • Response agency for emergency flood situations within its operating area. • Control agency for waterway pollution within its operating area.	
Department of Education and Training DET **School Principals**	• As requested by the VICSES Incident Controller, arrange for the relocation of students to another school (or staging point) during school hours for those students whose travel arrangements are likely to be disrupted by flooding and/or road closures. When students are relocated to an area outside the flood zone, DET (via individual schools) will make arrangements, with parents, for students to be pick-up or bussed home at the end of the school day.	
Environment Protection Authority EPA	• Works with Councils and DELWP in flood-affected communities, to designate landfill facilities for the disposal of dead livestock. • Works with Councils, farmers and landowners on disposal of waste related to flood events. • EPA also assists the waterway manager on disposal of large numbers of flood-related fish deaths.	The Environment Protection Authority Victoria (EPA)
Essential Services Operators	The operators of essential services infrastructure are responsible for developing and implementing site specific strategies to mitigate all risks to business including: • Assessing risk and consequences posed by flooding • Developing and implementing flood risk mitigation plans for each facility at risk of flooding. • Developing flood response plans.	
Coliban Water CW	• Key Support Agency for flood. • Keep VICSES advised of the status of utilities and the ongoing ability to provide services. • Advise VICSES of the security of critical water and wastewater assets to assist preparedness and response activities in the event of flood. • Maintain or improve the security of critical water and	

Agency/ Communities'	Specific "Flood" Responsibilities	Web links and Comments
	wastewater. • Check and correct where possible the operation of critical water and wastewater assets in times of flood. • Advise the IC in the event of inundation of critical water and wastewater assets.	
Relief & Recovery Support Services	• Refer to the Municipal Emergency Management Plan (MEMP)	Red Cross, VCC, DHHS, Salvation Army, etc.
Powercor	• Provide advice to the VICSES Incident Controller of any need to disconnect power supplies or of any timetable for reconnection. • Clear or make safe any hazard caused by power lines or electrical reticulation equipment. • Assess the necessity for and implement the disconnection of customers' electrical installations where these may present a hazard. • Advise the public as to the availability or otherwise of the electricity supply. • Inspect, test and reconnect customers' electrical installations as conditions allow.	Powercor - Electricity - Interruptions & Faults
Telstra	• Maintain Fixed and Mobile telephone services. • Repair and restore telephone facilities damaged by flooding. • Maintain Victorian Government Emergency Radio Network. • Provide additional telecommunications support. This can be done by the use of our mobile base stations for mobile phones and the setup of a complete exchange if one gets damaged.	
Victoria Police VicPol	• Co-locate with and assist the Incident Controller with the decision and warning stages if required. • Manage the withdrawal, shelter and return stages of the evacuation in consultation with the Incident Controller and Health Commander. • With local assistance (MERC/MERO) source and manage resources to facilitate evacuation in consultation with control and support agencies. • Maintain ongoing liaison with the Incident Controller for the duration of the evacuation. • Monitor the establishment and maintenance of safe access and egress routes for evacuees. • In consultation with the Incident Controller and other agencies maintain communications with the affected community. • Ensure registration of evacuees is initiated if required.	
VicRoads	• Close and reopen roads as necessary and advise the VICSES Incident Controller and Council of the closure and later re-opening. • Provide road condition information to the public.	Incidents & alerts : VicRoads

Agency/ Communities'	Specific "Flood" Responsibilities	Web links and Comments
Victorian State Emergency Service VICSES	• The VICSES is the state authority responsible for managing response to floods, including public meetings and decisions on flood response such as evacuation. • Coordinating activities of supporting agencies and organisations and ensuring that liaison is established with them. • Coordinate a public education program so residents of flood prone areas can be made aware of and ready for the flood threat. • Develop and maintain a flood intelligence system. • Coordinate the development and operation of flood warning services for the community. • Ensuring that people/communities at risk of flooding are identified and monitored. • Provide information services in relation to a flooding event. • Direct the conduct of flood rescue and evacuation of people and/or communities in support of VicPol. • Coordinate operations in accordance with its Sandbagging Policy i.e. by providing sandbags and sand to local communities. • Advise the community and supporting agencies when flood operations have been completed. • Support in flood recovery, if requested. • After a significant flood event, VICSES, NCCMA and Council will co-ordinate the collection and collation of flood intelligence, including local knowledge.	Call 132 500 for emergency SES assistance during a flood or storm. VICSES Information Line (1300 842 737) when activated. Emergency Plans and Kits — Victoria State Emergency Service VICSES community education program to support community and business in responding to flood emergencies Link: FloodSafe — Victoria State Emergency Service Your local flood information — Victoria State Emergency Service
VLine	• Close and re-open the line as necessary and advise the VICSES Incident Controller.	
Mount Alexander Shire, or Council	• Key Support Agency for flood. • Control development on floodplains through their local planning schemes. • Manage local community flood mitigation infrastructure. • Procure sandbags to protect Council owned facilities including Community Critical Facilities managed by Council. • Identify Community Critical Facilities. • At the request of the VICSES Incident Controller, deploy personnel and resources for flood related activities. • Coordinate the community relief and recovery arrangements in accordance with the Municipal Emergency Management Plan (MEMP). • Close and reopen Council roads as necessary and advise the VICSES Incident Controller and VicRoads of the closure and later re-opening • In conjunction with the DHHS, provide for the management of health hazards associated with flooding. • Ensure premises are fit and safe for reoccupation and assess any need for demolition. • Coordinate clean-up including disposal of sandbags.	

Agency/ Communities'	Specific "Flood" Responsibilities	Web links and Comments
North Central Catchment Management Authority (NCCMA)	• North Central Catchment Management Authority has statutory powers under the *Water Act 1989* to manage waterways, floodplains and rural drainage. • Prepare a Floodplain Management Strategy for their region. The strategy includes four objectives: ○ Adopt a consistent approach to assessing flood risks and prioritising flood management activities, ○ Build relationships and embed accountabilities for floodplain management, ○ Provides transparency and consistency in managing flood risks, ○ Encourage communities to takes actions to manage their own risks, allowing local communities to determine their flood service needs. • Provide input to planning schemes, responding to planning permit referrals and helping resolve planning issues. • Facilitate the development, maintenance and upgrading of regional flood warning systems. • Coordinate the collection of flood information such as: flood photography, flood heights and flow rates and velocities in times of significant floods. • During a flood provide emergency support VICSES: ○ With advice on the behaviour and movement of floods, ○ By monitoring regional flood warning systems, ○ Coordinating flood monitoring and collecting data. • Develop and prioritise flood recovery programs for CMA assets/waterways, including restoring impacts of river erosion where there is an immediate danger of the formation of river breakaways and/or immediate danger to CMA and public assets.	

3.1.1 Municipal Operation Centre (MOC)

If established, liaison with the MOC will be through the established Division/Sector Command and through Municipal involvement in the IEMT, in particular the Municipal Emergency Response Coordinator (MERC). The VICSES RDO / ICC will liaise with the centre directly if no Division/Sector Command is established.

The function, location, establishment and operation of an emergency coordination centre if relevant will be as detailed in the MEMP.

3.1.2 Escalation

Many 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 The six C's

The six C's of Command, Control, Coordination, Consequence, Communication and Community Connection arrangements in this MFEP must be consistent with those detailed in State and Regional Flood Emergency Plans and the MEMP. For further information, refer to Part 3 of the EMMV.

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

3.2.1 Control

Functions 5(a) 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 prepared under the *Emergency Management Act 1986 (as amended)*, identifies VICSES as the Control Agency for flood. It identifies DELWP as the Control Agency responsible for "dam safety, water and sewerage asset related incidents" and other emergencies. A more detailed explanation of roles and responsibilities is provided in later sections of Part 7 of the EMMV.

All flood response activities within the Mount Alexander Shire including those arising from a dam failure or retarding basin / levee bank failure incident will therefore be under the control of the appointed IC, or delegated representative.

3.2.2 Incident Controller (IC)

An Incident Controller (IC) will be appointed by the VICSES (as the Control Agency) to command and control available resources in response to a flood event on the advice of the Bureau of Meteorology (or other reliable source) that a flood event will occur or is occurring. The IC responsibilities are as defined in Part 3 of the EMMV.

3.2.3 Incident Control Centre (ICC)

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

3.2.4 Divisions and Sectors

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

The following Divisions and Sectors may be established to where applicable to assist with the management of flooding within the Municipality:

Division	Sector
Castlemaine - CFA Station	Castlemaine (SES)
	Guildford (CFA)
	Newstead (CFA)
	Baringhup (CFA)
	Campbell's Creek (CFA)

Note – The IC may establish additional Divisions/Sectors, dependant on the event

3.2.5 Incident Management Team (IMT)

The IC will form an Incident Management Team (IMT).

Refer to Part 3 of the EMMV for guidance on IMTs and Incident Management Systems (IMSs).

3.2.6 Emergency Management Team (IEMT)

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

Organisations, including Mount Alexander Shire, required within the IEMT 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 3 of the EMMV for guidance on IEMTs.

3.2.7 On Receipt of a Flood Watch / Severe Weather Warning

VICSES RDO (until an incident controller is appointed) or IC will undertake actions as defined within the flood intelligence cards (**Appendix C**). General considerations by the IC/VICSES RDO will be as follows:

- Review 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, flood rescue and air support
- Notify and brief appropriate officers. This includes Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Council, other emergency services through the EMT.
- Assess ICC readiness (including staffing of IMT and IEMT) and open if required
- Ensure flood warnings and community information is prepared and issued to the community where required
- Develop media and public information management strategy
- Monitor watercourses and undertake reconnaissance of low-lying areas
- Ensure flood mitigation works are being checked by owners
- Develop and issue incident action plan, if required
- Develop and issue situation report, if required

3.2.8 On Receipt of the First and Subsequent Flood Warnings

VICSES RDO (until an incident controller is appointed) or IC will undertake actions as defined within the flood intelligence cards **(Appendix C).** General considerations by the IC/VICSES RDO will be as follows:

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters, rising, peaking or falling?
- Review flood intelligence to assess likely flood consequences.
- Consider:
  - What areas may be at risk of inundation?
  - What areas may be at risk of isolation?
  - What areas may be at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption?
  - The characteristics of the populations at risk
- Determine what the at-risk community need to know and do as the flood develops.
- Warn the at-risk community including ensuring that an appropriate warning and community information strategy is implemented including details of:
  - The current flood situation
  - Flood predictions
  - What the consequences of predicted levels may be
  - Public safety advice
  - Who to contact for further information
  - Who to contact for emergency assistance
- Liaise with relevant asset owners as appropriate (i.e. water and power utilities)
- Implement response strategies as required based upon flood consequence assessment.
- Continue to monitor the flood situation – www.bom.gov.au/vic/flood/
- Continue to conduct reconnaissance of low-lying areas

3.3 Public Information and Warnings

VICSES uses EM-COP Public Publishing to distribute riverine and flash flood warnings in Victoria. The platform enables automatic publishing to the VicEmergency app, website and hotline (1800 226 226). Communities can also access this information through VICSES social media channels (Victoria State Emergency Service on Facebook and VICSES News on Twitter) and emergency broadcasters, such as Sky News TV and various radio stations (current list available via the EMV website).

VICSES Regions (or ICCs where established) lead the issuing of warnings for riverine flood events when pre-determined triggers are met (issuing of a BOM Flood Watch or Warning), and share locally tailored information via the standard VICSES communication channels (social media, traditional media, web and face to face). These activities are coordinated by the VICSES RDO and approved by the VICSES RAC, or the PIO and IC respectively (when an ICC is active).

If verified reports are received of flash flooding posing, or resulting in, a significant threat to life or property, VICSES Regions (or ICCs) will issue a flash flood warning product via EM-COP.

VICSES at the state tier (or SCC Public Information Section) plays an important role in sharing riverine and flash flood information via state-based standard communication channels.

During some emergencies, VICSES may alert communities by sounding a local siren, or by using the Emergency Alert (EA) platform to send an SMS to mobile phones or a voice message to landlines. The use of sirens for higher-end warnings has been pre-determined, and mapped to relevant warning templates in EM-COP.

EM-COP Public Publishing Business Rules for Riverine and Flash Flood are available in the **Public Information tab of the IMT Toolbox,** providing further guidance on specific triggers, roles and responsibilities. VICSES SOP057 and JSOP 04.01 provide further guidance.

Refer to **Appendix C and D** for the specific details that may assist with local impacts and consequences to add detail to enhance public information and warnings.

3.4 Initial Impact assessment

Initial impact assessments will be conducted in accordance with Part 3 section 5.2.5 of the EMMV to assess and record the extent and nature of damage caused by flooding. This information may then be used to provide the basis for further needs assessment and recovery planning by DHHS and recovery agencies.

3.5 Preliminary Deployments

When 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.

3.6 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 State Emergency Response Plan - Flood.

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 etc;

2. If evacuation is possible, then evacuation should be the adopted strategy and it must be supported by a public information capability and a rescue contingency plan;

3. Where it is likely people will become trapped by floodwaters due to limited evacuation options safety advice needs to be provided to people at risk. Advise should be given to not attempt to flee by entering floodwater if they become trapped, 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 Mount Alexander Shire MERC and MERO at the earliest opportunity to allow for relief preparation to commence.

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

Refer to **Appendix C** for response arrangements for flash flood events.

3.7 Evacuation

The IC decides whether to warn people to evacuate or if it is recommended to evacuate immediately.

Once the decision is made VicPol are responsible for the management 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 EMMV Part 8, Appendix 9 and the Evacuation Guidelines for guidance of evacuations for flood emergencies.

Refer to **Appendix C** of this Plan and the MEMP for additional local evacuation considerations for the municipality.

3.8 Flood Rescue

VICSES may conduct flood rescues. Appropriately trained and equipped VICSES units or other agencies that have appropriate training, equipment and support 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.

Victoria Police Rescue Coordination Centre should be notified of any rescues that occur: (03) 9399 7500

The following resources are available within Mount Alexander Shire to assist with rescue operations:

Known high-risk areas/communities (i.e. low-lying islands) where rescues might be required include:

- The Loddon House Caravan Park in Baringhup when the Cairn Curran storage is full and when the Loddon River, Cairn Curran Tail gauge height (407210) is greater than 3.5m.
- Newstead township (due to possible isolation)

3.9 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

The IC may request aircraft support through the State Air Desk located at the SCC will establish priorities.

3.10 Resupply

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

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

After the impact, VICSES can support isolated communities through assisting with the transport of essential items to isolated communities and assisting with logistics functions.

Resupply operations are to be included as part of the emergency relief arrangements with VICSES working with the relief agencies to service communities that are isolated.

3.11 Essential Community Infrastructure and Property Protection

Essential Community Infrastructure and Property (e.g. residences, businesses, roads, power supply etc.) may be affected in the event of a flood.

The Mount Alexander Shire maintains a small stock of sandbags, and back-up 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 Community Infrastructure. Other high priorities may include for example the protection of historical buildings.

Property may be protected by:

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

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

Contact your local VICSES representative for the most current Sandbag Guidelines or download it from IMT Toolbox in EMCOP- Operations.

Refer to **Appendix C** for further specific details of essential infrastructure requiring protection and location of sandbag collection point(s).

3.12 Disruption to Services

Disruption to services other than essential community infrastructure and property can occur in flood events. Refer to **Appendix C** for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in Mount Alexander Shire.

3.13 Road Closures

Mount Alexander Shire and VicRoads will carry out their formal functions of road closures including observation and placement of warning signs, road blocks etc. to its designated local and regional roads, bridges, walking and bike trails. Mount Alexander Shire staff should also liaise with and advise VicRoads as to the need or advisability of erecting warning signs and / or of closing 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 and Mount Alexander Shire will communicate community information regarding road closures. Information will be updated on the VIC Traffic website: https://traffic.vicroads.vic.gov.au/

Refer to **Appendix C** for specific details of potential road closures.

3.14 Dam Spilling/ 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.

DELWP have developed Dam Safety Emergency Plans for municipalities where it is applicable.

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

3.15 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 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 Mount Alexander Shire Environmental Health Officer to inspect and report to the MERO and the ICC on any water quality issues relating to flooding.

3.16 Access to Technical Specialists

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

3.17 After Action Review

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

All agencies involved in the flood incident should be represented at the after action review.

Part 4. Emergency relief and recovery arrangements

4.1 General

Arrangements for recovery from a flood incident within the Mount Alexander Shire are detailed in the Mount Alexander Shire Municipal Emergency Management Plan (MEMP).

4.2 Emergency Relief

The decision to recommend the opening of an emergency relief centre sits with the IC. The IC is 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).

The range and type of emergency relief services to be provided in response to a flood event will be dependent upon the size, impact, and scale of the flood. Refer to Part 4of the EMMV for details of the range of emergency relief services that may be provided.

- Suitable relief facilities identified for use during floods are detailed in the MEMP.
- Details of the relief arrangements are available in the MEMP.

4.3 Animal Welfare

Matters relating to the welfare of livestock and companion animals (including feeding and rescue) are to be referred to DEDJTR.

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

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

Animal Shelter Compound: Mount Alexander Animal Welfare Shelter, 24 Langslow St, Castlemaine (ph. 0354 72 5277).

4.4 Transition from Response to Recovery

VICSES as the Control Agency is responsible for ensuring effective transition from response to recovery. This transition will be conducted in accordance with existing arrangements as detailed in Part 3 of the EMMV.

Appendix A: Flood threats for Mount Alexander Shire

Historic Floods

The Mount Alexander Shire is subject to flash flooding, with large storm events resulting in many town stormwater drainage systems and waterways exceeding their capacity and breaking out of bank. For the majority of the region peak river flows occur within 3 to 6 hours from rainfall. However, Baringhup's flood behaviour is mainly dominated by storage levels in the Cairn Curran Reservoir, steep rises in floodwater can occur in Baringhup within 30 minutes of Cairn Curran spilling.

Flooding affects a large number of towns and large rural areas along watercourses, these locations include; Castlemaine, Campbell's Creek, Chewton, Newstead, Baringhup, Guildford, Elphinstone, Taradale, Metcalfe, Yapeen, Talbot, Maldon and Harcourt.

Flooding has occurred frequently within the Mount Alexander Shire, refer to the summary below. The largest recent event was in January 2011. The Mount Alexander Shire reported the January 2011 flood event affected;

- 65 households
- 40 farming properties
- 11 commercial properties suffered severe flood damage
- 10 council asset buildings suffered severe flood damage
- Damage to council and community infrastructure, including footpaths, walking tracks, and recreation facilities.

The severity of this event had far reaching impacts on the council after the event occurred;

- Restricted access around the Shire due to temporary and long term road closures
- Displacement of people from their permanent residences
- Disruption to a number of local businesses
- Significant loss of property caused financial hardship to the community
- Damage to rural properties including loss of fencing, livestock, crops and stock feed.

Council are working closely with DELWP, VICSES and the North Central CMA to improve flood waring within the region. This will lead to increased community warning time, critical to improving their ability to take action to prepare for flooding.

Council are also currently working towards constructing additional levees in Castlemaine and Campbells Creek to protect buildings at high risk of flooding. The proposed levees were recommended by a flood study (GHD 2015) undertaken by the North Central CMA.

1889

A major flood occurred in Castlemaine on New Year's Day. There was destruction of property at Chewton, Castlemaine, Campbells Creek, Yapeen, and Guildford. The devastation included the loss of several lives and the destrution of several thousand pounds worth of property.

1909

On Sunday 10 September at 2:30 am. Creeks spread out all over the low lying parts of the districts, and a number of dredging plants were submerged. The Botanical Gardens were flooded. Several houses were inundated. This flood event was the highest recorded flood which affected a number of businesses, houses and rural properties that were severely impacted.

1934

Heavy rainfall occurred in the district late in the afternoon in October, causing the creeks to rise rapidly. At Newstead very heavy rain fell, totaling 208mm in three hours. The road between Castlemaine and Newstead was flooded. The water of the Loddon River at Newstead was within 304mm (a foot) of the top of the levee bank.

1973

The Shire recorded 127.8mm for January 1973 resulting in the second highest flood on record.

2000

On Australia Day, 26 January, several houses in the Campbells Creek area were flooded. Some houses had water pass over the floor due to overland flash flows.

On Tuesday 24 October the Loddon River peaked at 5.62 metres at Newstead and the levee bank at Strangways was overtopped.

2012

Mount Alexander Shire received over 1300 calls for assistance including: 115 Households affected - 63 properties which experienced above floor flooding; 20 Local businesses were flood affected; 11 Council buildings were flood affected and 280 requests regarding public infrastructure.

2010/2011

Castlemaine, Chewton and Campbells Creek were affected by overland and riverine floodwaters in September 2010, November 2010 and again in January 2011. The 2011 flood event is believed to be the highest flood on record. The Shire received approximately five times the January average rainfall. This resulted in flooding to 65 households, 40 farming properties and damage to Council and community infrastructure.

History of flooding in Mount Alexander Shire.

Historic flood events

Newstead	Baringhup	Castlemaine, Campbells Creek and Chewton	Regional areas (Guildford, Talbot, Metcalfe, Taradale, Elphinstone, Maldon, Harcourt)
		2000	2000
		2012	2012
September 2010		September 2010	September 2010
January 2011	January 2011	January 2011	January 2011
November 2011		November 2011	November 2011
		February 2012	February 2012
September 2016		September 2016	September 2016
October 2016	October 2016	October 2016	October 2016

Building damages for flood events (AEP's and historic)

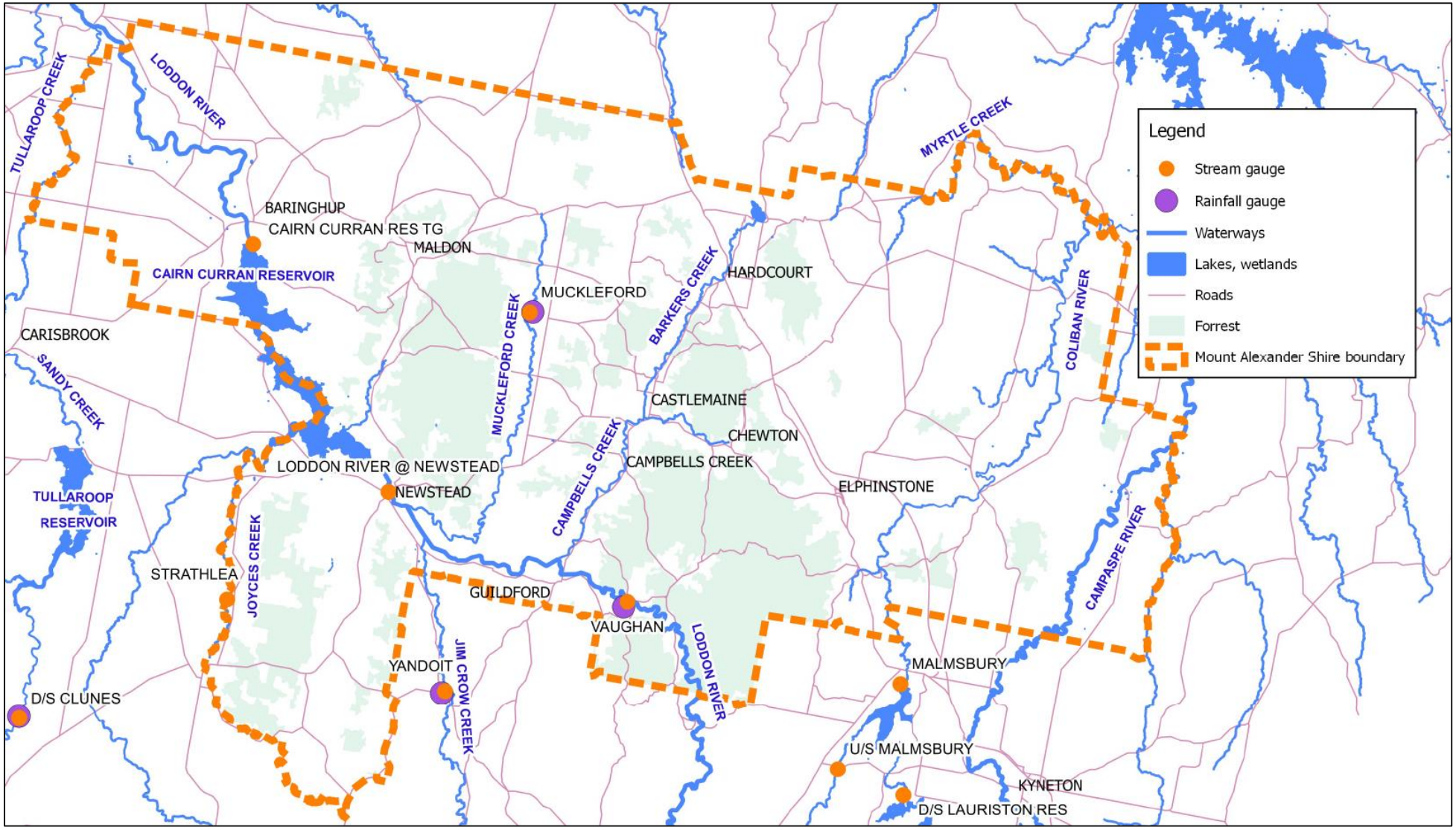
Annual Exceedance Probability (AEP)	Total number of properties flooded (buildings flooded above floor)				Total damages for the council region.
	Newstead	Baringhup	Castlemaine, Campbells Creek and Chewton	Regional* (Guildford, Talbot, Metcalfe, Taradale, Elphinstone, Maldon, Harcourt)	
0.5%	(81)*	(13)*	(112)		206
1%	(81)*	(13)*	(69)		163
2%			(45)		45
5%			(26)		26
10%			(12)		12
20%			(4)		4
January 2011	(1)*	> 12 (9)	?		96*
September 2016	(0)*	12 (9)	6		15
November 2011	0	0	?		0
September 2010	0	0	?		0
October 2016	0	0			**0**

* Damages are based on council recorded information and community anecdotal information (of low accuracy)

Description of Major Waterways and Drains

Waterway or Drain	Description
Campaspe River	The Campaspe River begins to the south of the Shire in the ranges around Trentham and flows north through the eastern areas of the Shire. The Campaspe River also flows north through the eastern part of the Shire joining the Campaspe river at Lake Eppalock.
Coliban River	The Coliban River also flows north through the eastern part of the Shire joining the Campaspe river at Lake Eppalock. The Coliban River flows through the community of Metcalfe. The Coliban River also flows north through the eastern part of the Shire joining the Campaspe river at Lake Eppalock.
Loddon River	The Loddon River catchment covers the western section of the Shire with the Loddon River beginning in the ranges to the west of Trentham and travelling north into the Shire through the communities of Vaughan, Guildford and Newstead before entering Cairn Curran Reservoir. After leaving the reservoir at Baringhup the Loddon River flows north west out of the Shire.
Barkers Creek	Barkers Creek and Forest Creek meet at Castlemaine and form Campbell's Creek which then passes through the township of Campbells Creek on its way to the Loddon River at Guildford
Campbells Creek	Campbells Creek catchment is centred on the area around Castlemaine, with Barkers and Forest Creeks joining Campbells Creek in the town of Castlemaine.
Muckleford Creek	Muckleford Creek starts near Walmer, flows south where it joins the Loddon River upstream of the Newstead gauge.
Jim Crow Creek	Jim Crow Creek drains the northern end of the Wombat State Forest. It a tributary of the Loddon River, connecting upstream of the Newstead gauge.
Joyces Creek	Joyces Creek forms the western boundary of the Mt Alexander Shire and flows from Campbelltown north through Strathlea and flows into Cairn Curran Reservoir at Joyces Creek west of Newstead.

Towns and waterways



Dam Spilling/ Failure

Flooding resulting from spilling or failure of the following dams is likely to cause significant structural and community damage

Location	Owner	Full Supply Level (ML)	Dam Capacity (ML)	Comments
Cairn Curran Reservoir Baringhup	Goulburn Murray Water	208	147,130	Gated spillway. Refer to web link for the latest storage levels: https://waterline.g-mwater.com.au/waterstatus/#ST@G407241A
Expedition Pass Reservoir Golden Point	DELWP (Parks Vic)		264	
McCay Reservoir Elphinstone	Coliban Water		1,360	
Barkers Creek Reservoir Harcourt North	Coliban Water	14	1,690	Not a gated spillway
Malmsbury Reservoir	Coliban Water	12,034		Although Malmsbury, Lauriston & Upper Coliban Reservoirs are located outside the shire, a significant flood event or catastrophic failure would cause damage in the Metcalf region. They have a combined storage volume of approximately 70,000ML
Lauriston reservoir	Coliban Water	19,790		As above
Upper Coliban Reservoir	Coliban Water	37,770		As above

Levees and other mitigation structures

The main levees within the Mount Alexander Shire council region include;

- Newstead Levee Bank (Loddon River) (refer to section C2 for a levee map)
- Campbells Creek Town Levee and National School Lane Levee (refer to section C1 for a levee map)
- Castlemaine Forest Street and Elizabeth Street levees(refer to section C1 for a levee map)
- Baringhup Levee Bank (Murphy's Road) (refer to section C3 for a levee map)
- Sutton Grange Levee Bank (Carnogan's Road)
- Yapeen Levee Bank (Bakery Lane)

Details regarding the protection level of these levees are unknown. There is also limited information regarding the construction of these levels. In addition to these levees there are also a large number of unregistered levees within Campbell's Creek, Chewton and Taradale.

Appendix B: Typical flood peak travel times

Source (MFEP and North Central Catchment Flood Intelligence Summary)

Location From	Location To	Typical Travel Time	Comments	Duration
Loddon River				
Start of rainfall (upper catchment)	Vaughan	~ 3 hours	To steep rise in floodwater	
Start of rainfall (upper catchment)	Vaughan	~ 27 hours	To peak	1 day
Start of rainfall (upper catchment)	Newstead	~ 2 - 4 hours	To steep rise in floodwater	
Vaughan	Newstead	~ 6 hours	To peak	1 day
Time between Cairn Curran spill and steep rise in floodwater at Baringhup		~ 30 minutes	Depending on the starting water level of the Cairn Curran Reservoir and releases.	4 days (January 2011)
Start of rainfall (upper catchment)	Harcourt	~ 3 hours	To peak	1 day
Start of rainfall (upper catchment)	Castlemaine, Campbells Creek, Chewton	~ 2 - 4 hours	To steep rise in floodwater	
Start of rainfall (upper catchment)	Castlemaine, Campbells Creek, Chewton	~ 3 - 6 hours	To peak	1 day
Start of rainfall (upper catchment)	Muckleford Creek at Walmer	~ 3 - 4 hours	To peak	1 day
Start of rainfall (upper catchment)	Muckleford Creek at Maldon – Castlemaine Road	~ 5 hours	To peak	1 day

Appendix C1: Castlemaine, Campbells Creek and Chewton Flood Emergency Plan

Overview of Flooding Consequences

Significant flood events in recent years that have impacted Castlemaine, Campbells Creek and Chewton in September 2010, November 2010, January 2011 and in February 2012. The January 2011 flood event was the largest recent flood on record, causing significant damage to businesses, homes, roads and sporting facilities, and caused significant distress and hardship to members of the community.

Castlemaine, Campbells Creek and Chewton have been affected by flooding form Barkers Creek, Forest Creek and Campbells Creek. These towns are subject to flash flooding, with large storm events resulting in stormwater drainage systems and waterways exceeding their capacity and breaking out of bank. Typically there is steep rise in flood levels 2 to 4 hours from rainfall, peak river flows occur within 3 to 6 hours from rainfall. Forest Creek in particular has the potential to rise very quickly in only a few hours after the start of heavy rainfall (NC CMA 2015).

Currently there are no stream or rainfall gauges within these towns to provide early warning, and there is no flood warning service provided by the Bureau of Meteorology.

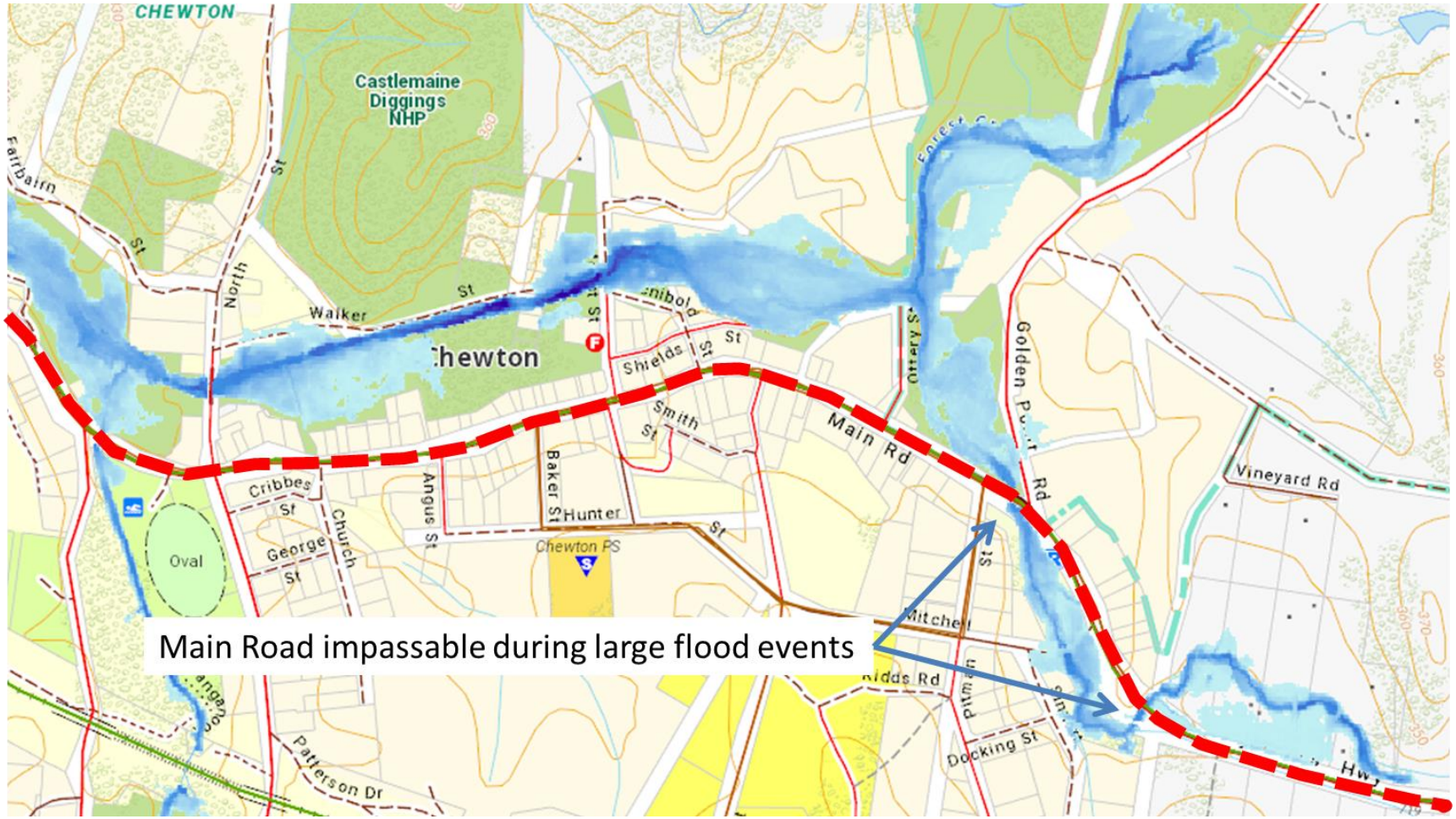
Regional map showing Castlemaine, Campbells Creek and Chewton main waterways.

Castlemaine Power Station surrounded by water January 2011.

Central Carpets Castlemaine impacted by flooding in January 2011.

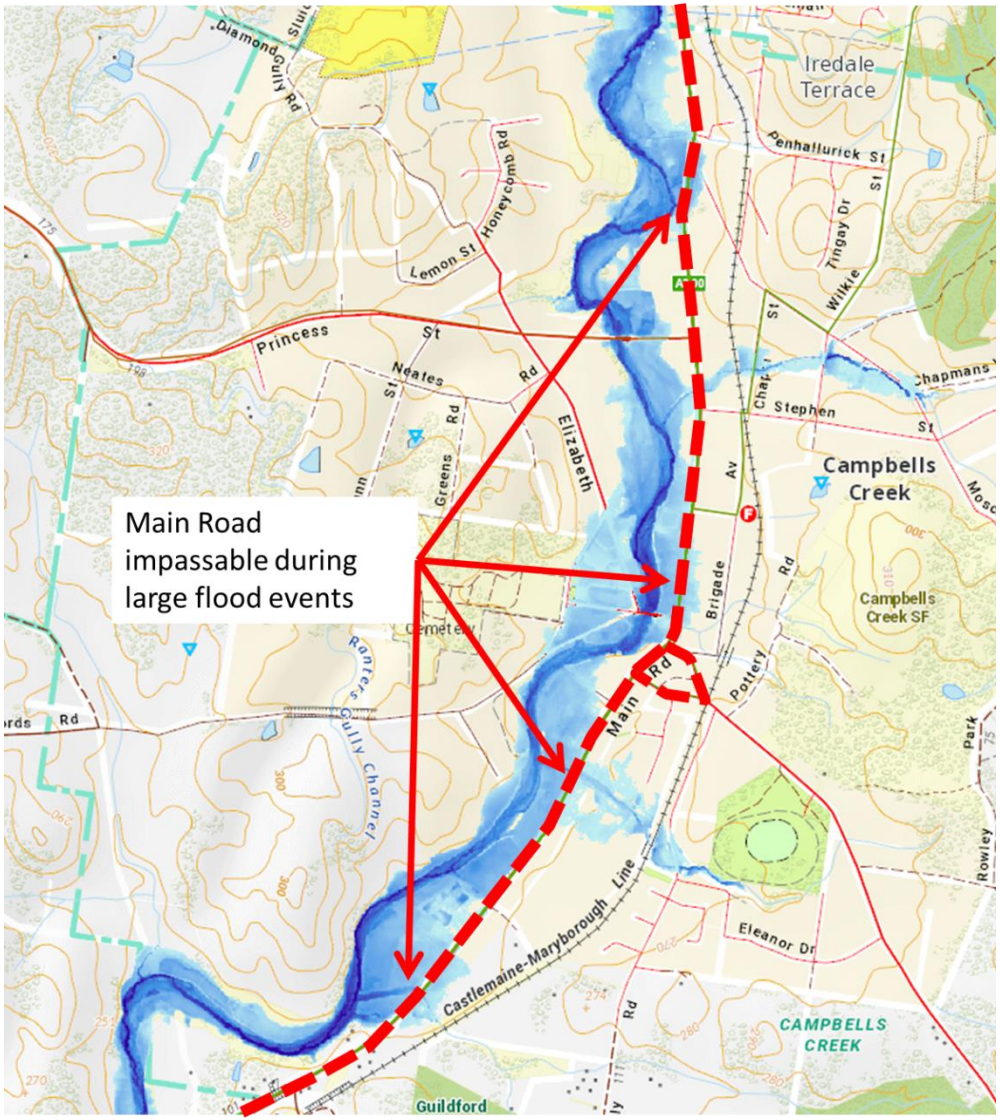
School Bus route description

In Chewton the school bus route follows Main Road (Pyrenees Highway). During a 20% AEP flood event, flooding may impact Main Road. During larger events Main Road is impassable, refer to figure below.



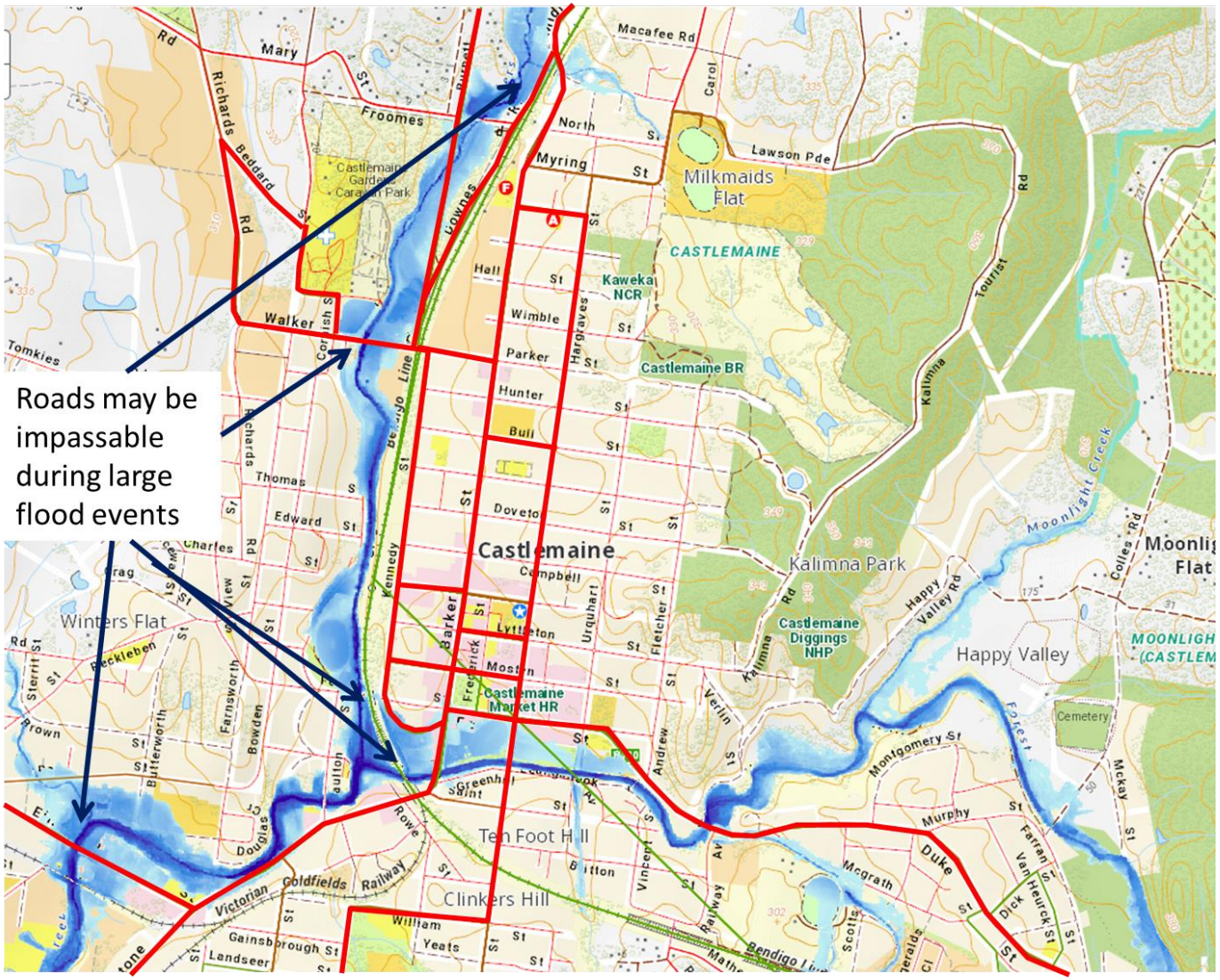
Chewton flood impacts (1% AEP flood extent shaded blue) on the school bus route (red dashed line).

In Campbells Creek the school bus route follows Main Road, Station Street and Campbells Creek-Fryers Road. During a 20% AEP flood event, flooding may impact Main Road, during larger events Main Road is impassable, refer to figure below.



Campbells Creek flood impacts (1% AEP flood extent shaded blue) on school bus routes (red dashed line).

In Castlemaine, the main roads the school bus route follows include: Elizabeth Street, Barkers Street, Walker Street, Johnstone Street, Downes Road, Hargraves Street, Duke Street, Kennedy Street, Midland Highway and Burnett Road. During a 20% AEP flood event, flooding may impact Elizabeth Street, Hargraves Street, Duke Street, Johnstone Street and Walker Street. During larger flood events these roads may be impassable, refer to figure below.



Castlemaine flood impacts (1% AEP flood extent shaded blue) on school bus routes (thick red line).

Asset Name and location	AEP	Consequence / Impact	Mitigation/ Action
Campbells Creek Primary School	2	The grounds of the school are likely to be impacted by flooding, buildings are not likely to be impacted above floor.	Evacuate the school when flooding is likely.
VICSES Unit building,	5	Flooding may occur adjacent to the unit building during a 5% AEP flood, likely to impact the unit building during a 2% AEP flood.	Relocate to a local CFA brigade shed.
Castlemaine Botanic Gardens	20	Castlemaine Botanic Gardens are inundated.	None
Camp Reserve Oval	20	Camp Reserve Oval will start to be impacted by flooding.	None
Railway Hotel (Gingell Street)	20		Provide sandbags.
Railway line (Elizabeth Street)	20	The Maldon Railway line is impacted by flooding, adjacent to Elizabeth Street.	Check no debris build up adjacent to culvert structures, reduce likelihood of blockages.
Castlemaine Power Station	20	Flooding begins to impact the power station grounds during a 20% AEP flood event.	?

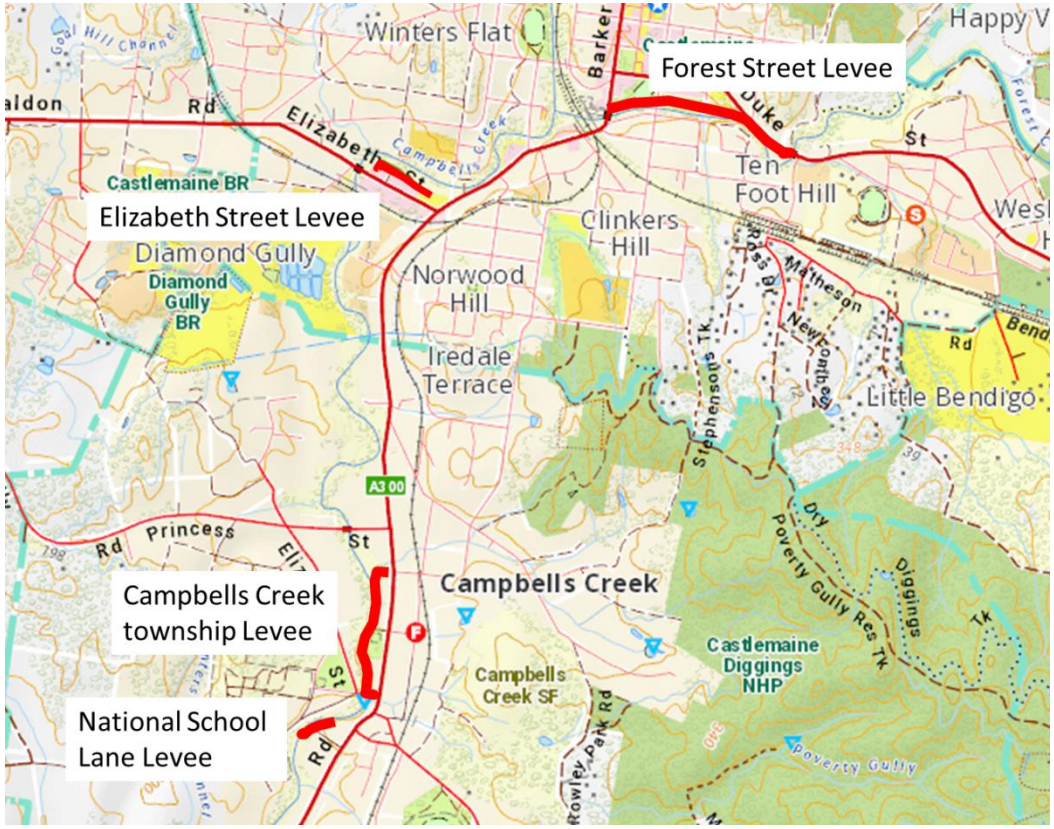
Flood Mitigation

Within Castlemaine there are two levees with unknown protection levels and maintenance, include;

- Elizabeth Street Levee (refer to maps below)
- Forest Street Levee (refer to maps below)

Within Campbells Creek there are two levees with unknown protection levels and maintenance, include;

- Campbells Creek township levee, adjacent to Main Road (refer to maps below)
- National School Lane levee (refer to maps below)



Castlemaine and Campbells Creek levees (shown in red).

Elizabeth Street Levee, Castlemaine.

Forest Street Levee, Castlemaine.

Campbells Creek Township Levee.

National School Lane Levee, Campbells Creek.

Flood Impacts and Required Actions

High velocities generated during flash flood events carry debris, which can often cause blockages to structures. These structure blockages locally increase flood levels and can increase the number of buildings flooded. The North Central CMA 2015 Flood Management Plan highlighted a number of structures in Castlemaine, Campbells Creek and Chewton are prone to blockages during flood events. During the February 2012 flood Forest Creek, upstream of the confluence with Campbells Creek was blocked up. During large flood events structures that restrict flow and are prone to blockages include

- Roberts Avenue footbridge (Barkers Creek)
- Forest Street Bridge (Barkers Creek)
- Elizabeth Street Bridge (Campbells Creek)
- Alexandra Street Bridge (Campbells Creek)

Key recommendations from the flood study ask that regular works are undertaken surrounding key structures (bridges, culverts etc) to maintain vegetation to reduce the likelihood of blockages during flood events.

Castlemaine, Campbells Creek, Chewton Flood Intelligence Card

Flood Travel time				Time from start of rain to steep rise in floodwater 2 - 4 hours Time to peak 3 - 6 hours Riverine flooding duration: 1 day		
Observed rainfall at Castlemaine (mm) GHD 2015	**Annual Exceedance Probability (AEP)**	**Bakers Creek at Gaulton Street Bridge Design Flow (ML/d)**	**Castlemaine and Campbells Creek damages total number properties flooded (above floor)**	**Consequence/ Impact**	**Roads Impact**	**Action** **Actions may include: Evacuation, closure of road, sandbagging, issue warning and who is responsible etc.**
	0.5%		(112)	Water overtops Gaulton Street. One hundred and twelve properties flood above floor level, including eleven along Gaulton Street and fourteen along Elizabeth Street. The Chewton CFA Brigade (Mount Street) is impacted by flooding.	In addition to the roads listed below. Castlemaine: Gaffney Street, Goldsmith Court, Yandall Street, Campbells Creek:	
~ 83 mm in 6 hours to ~ 128 mm in 24 hours	1%		(69)	Castlemaine Hospital – Froomes Rd is overtopped by 200-300mm in a 1% AEP flood (not overtopped in smaller events). The other main access is via Walker Street, however this is overtopped by 150mm in a 5% AEP flood. Therefore, main access to the hospital is cut at a 1% AEP event.Campbells Creek Primary School (Main Road) is impacted by flooding (buildings may be impacted). Water overtops Forest Street. Water overtops Barkers Street between Bruce Street and Forest Street. Water overtops Hargraves Street. Sixty nine properties flooded above floor level.	In addition to the roads listed below. Castlemaine: Greenhill Avenue, Campbells Creek:	
~ 72 mm in 6 hours to ~ 113 mm in 24 hours	2%		(45)	Campbells Creek Primary School (Main Road) is impacted by flooding (no buildings likely to be impacted). Water overtops Johnstone Street directly north east of intersection with Elizabeth Street. Water overtops Princess Street. Water overtops southern end of Elizabeth Street directly north of intersection with Alexandra Street. Central Carpets flooded above floor level. Forty five properties flooded above floor level, including twelve properties in Campbells Creek township located along main Road. The Castlemaine VICSES Unit (Scotts Avenue) shed is impacted by flooding along Forest Creek.	In addition to the roads listed below. Castlemaine: Sterrit Street.	
~ 59 mm in 6 hours to ~ 95 mm in 24 hours	5%		(26)	Water overtops Walker Street. Water breaks out from Barkers Creek at the northern end of Gingell Street and floods four properties above floor level. Water overtops Elizabeth Street on the eastern side of the Elizabeth Street bridge. Three Elizabeth Street properties are flooded above floor level. Water overtops Main Road in Campbells Creek Township directly north of Alexandra Street. Twenty six properties flooded above floor level, including three properties in Campbells Creek township located along Main Road. These include the Campbells Creek Bowling Club and Campbells Creek Swimming Pool Reserve. Flooding along Forest Creek is close to impacting the Castlemaine VICSES Unit shed. Castlemaine Hospital – Walker St is overtopped by 150mm in a 5% AEP flood (not overtopped in lesser events). Access is available via Froomes Rd until a 1% AEP event, when it is overtopped by 200-300mm,		Sandbag houses. Deploy signs and close roads as needed.
192 mm over 6 days	January 2011	15,984		Buildings, houses and sheds flooded above floor: Central Carpets Castlemaine (Johnstone Street), the gardeners shed and other buildings at the Castlemaine Botanical Gardens, Castlemaine Power Station, house at 136 Main Road Campbells Creek, Cam Reserve Oval and Clubrooms, Castlemaine Woollen Mill buildings in Walker Street.		
157 over 2 days	February 2012	9,936		This flood occurred at night making observations challenging. Flow did not break out of Barkers Creek. Levels on Forest Creek near Greenhill Avenue and within the Caravan Park (near the confluence of Campbells Creek) were 200 mm higher than in January 2011. Forest Creek upstream of the confluence with Campbells Creek was ‘blocked up’.		
~ 50 mm in 6 hours to ~ 82 mm in 24 hours	10%		(12)	Twelve properties flooded above floor level. The majority of properties flooded above floor level are located on Gingell Street and Bruce Street. Castlemaine Central Cabin and Van Park inundated. Water overtops Midland Highway directly south of intersection with Moscript Street.	In addition to the roads listed below. Castlemaine: Moscript Street,	

					Masteson Close, Campbells Creek: Webbs Road, Blanket Gully Road,	
~ 41 mm in 6 hours to ~ 68 mm in 24 hours	20%		(4)	The Castlemaine Power Station (Elizabeth Street) will start to be impacted by flooding. Castlemaine Botanical Gardens inundated. Water overtops Gingell Street with three Gingell Street properties flooded above floor level, one being the Railway Hotel. Camp Reserve Oval inundated. Properties along western end of Bruce Street are inundated with one flooded above floor. level. Western Reserve inundated. Deep flooding along Campbells Creek The Maldon Railway line is impacted by flooding, adjacent to Elizabeth Street.	In addition to the roads listed below. Chewton: North Street, Castlemaine: Bruce Street, Gaulton Street, Sarah Coopey Lane, Walker Street, Froomes Road, Dudley Street, Merrifield Street, Elliot Street, Winter Avenue, Cunnack Street, Ray Street, Graceland Court, Doran Avenue. Campbells Creek: Blanket Gully Road	Sandbag houses. Deploy signs and close roads as needed.
~ 29 mm in 6 hours to ~ 50 mm in 24 hours	50%			Existing levee along Elizabeth Street/Campbells Creek, Leanganook Track/Forest Creek protection level is unknown. There are a number of new levees Mt Alexander Shire is working towards constructing, some were recommendations from the 2015 Castlemaine Flood Study.	Chewton: Mount Street, Ottery Street, Mitchell Street, Manchester Street. Castlemaine: Elizabeth Street, Forest Street, Gingell Street, George Street, Colles Road, Happy Valley Road, McGregor Street, Saint Street, Ray Street, Butterworth Street, Roberts Avenue, Langslow Street, Campbells Creek: Main Road, Lindsay Street, Princess Street, Alexandra Street, Fords Road, National Schools Lane.	Deploy signs and close roads as needed.
100 mm over 5 days	September 2016 (AEP unknown)		(6)	The Campbells Creek Bowling Club building was flooded above floor (104 Main Road). Several buildings were flooded above floor in Bruce Street (including 11 Bruce Street) in Castlemaine. x4 properties were reported to be impacted by flooding in Main Road (116, 120, 136, 138), not above floor. Bridge at Dinah Road, Chewton was damaged. The sealed surface of the Mitchel Street was washed away.	Castlemaine: Bruce Street, Elizabeth Street, Forest Street, Gingell Street, George Street, Colles Road, Happy Valley Road, McGregor Street, Saint Street, Ray Street, Butterworth Street, Roberts Avenue, Langslow Street, Campbells Creek: Main Road, Lindsay Street, Princess Street, Alexandra Street, Fords Road, National Schools Lane.	Deploy signs and close roads as needed.

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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain.

Appendix C2: Newstead Flood Emergency Plan

Overview of Flooding Consequences

During recent floods the Newstead town levee has provided protection. The 1% AEP flood extent map provided by the North Central CMA shows the Newstead levee is beached during a 1% AEP flood event. Although the accuracy of this flood extent map is low, given no flood studies have been undertaken for Newstead area, this map was used to define flood risk for Newstead during a 1% AEP flood event.

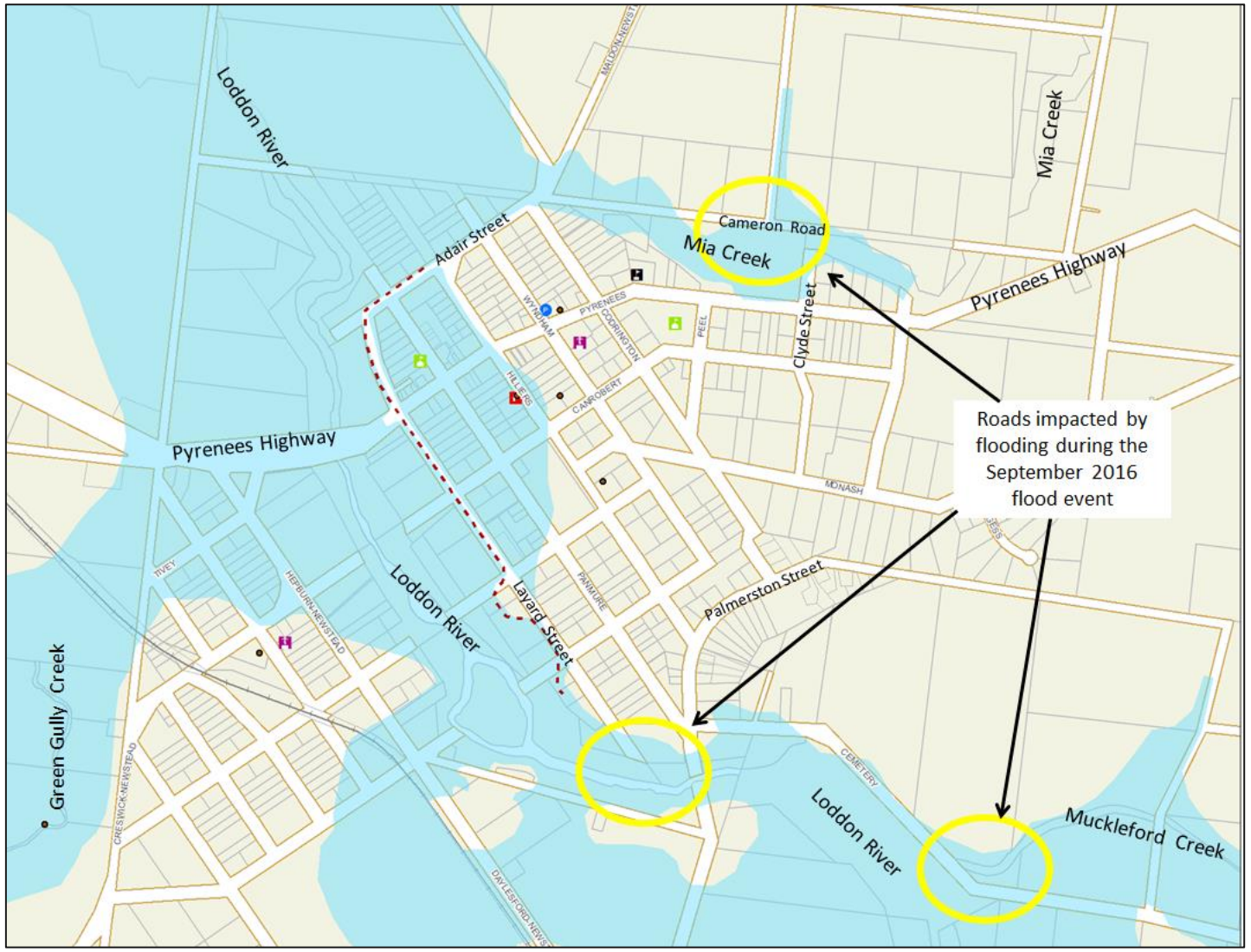
AEP Event	Properties Affected	Number of properties	Description of risk
1% AEP flood (NC CMA flood extent map)	**Residential / Commercial**	81	The flood extent map (which has low accuracy) shows that the town levee is breached during a 1% AEP flood event. Potentially x 81 buildings could be subject to flooding (within the flood extent). x5 buildings may be isolated (refer to flood extent map below for locations). Potential impacts on infrastructure may include: Newstead Tennis Club, Recreation Reserve, CFA building, Crown Hotel, Newstead Swimming pool. Dig Café, Bank, Visitor Information Centre, IGA supermarket, butchers and other small businesses. Town Walking tracks, town sewerage system. Buildings that may be impacted above or below floor may include: 35 Campbell Street, 1A and 2B Dundas Street, x9 Panmure Street (2, 8, 12, 24, 28, 30, 32, 34A, 36, 57) and 1 Layard Street. Refer to the 1% AEP flood extent map below showing the locations of buildings that may be impacted by flooding.
January 2011 flood event	**Residential / Commercial**	1	The Newstead levee protected the town during the January 2011 flood event. Buildings impacted by flooding include: a public toilet at Newstead Park and the Newstead Racecourse. Roads that were impacted by flooding include: Cameron Road and Clyde Street, north of Lyons Street.
September 2016 flood event	**Residential / Rural**	0	Council reported roads impacted by floodwater: Daylesford – Newstead Road, Church Street, Cemetery Road (at the Muckleford Creek crossing), the eastern section of Layard Street (east of the levee), Clyde Street and Cameron Road was impassable where they intersect Mia Creek. Access/egress was cut to a house; 10 Brights Road due to flooding along Butlers Creek (5km west of Newstead), a section of the road was washed away due to flooding.

Newstead 1% AEP flood extent (shaded blue), with 81 buildings that may be subject to flooding (red dots) and 5 buildings that may be isolated (yellow dots) (source North Central CMA).

Aerial photo showing buildings in Newstead that may be subject to flooding (within the North Central CMA 1% AEP flood extent).

Roads impacted by flooding

Newstead is cut in half by flooding along the Loddon River. However, there is uncertainty surrounding the flood magnitude when the Pyrenees Highway Bridge is impassable. Refer to the map below that show roads that were impacted by flooding during the September 2016 flood event (yellow circles) and during a 1% AEP flood event (shaded blue). Given Newstead is often inaccessible during flood events work needs to be done to ensure the community are well supported, have a plan and resources they needed.



Bus route disruption

The regional school bus routes (source from Floodzoom) shown in red on the map below indicates that the during a 1% AEP flood event roads that may be impactec le;

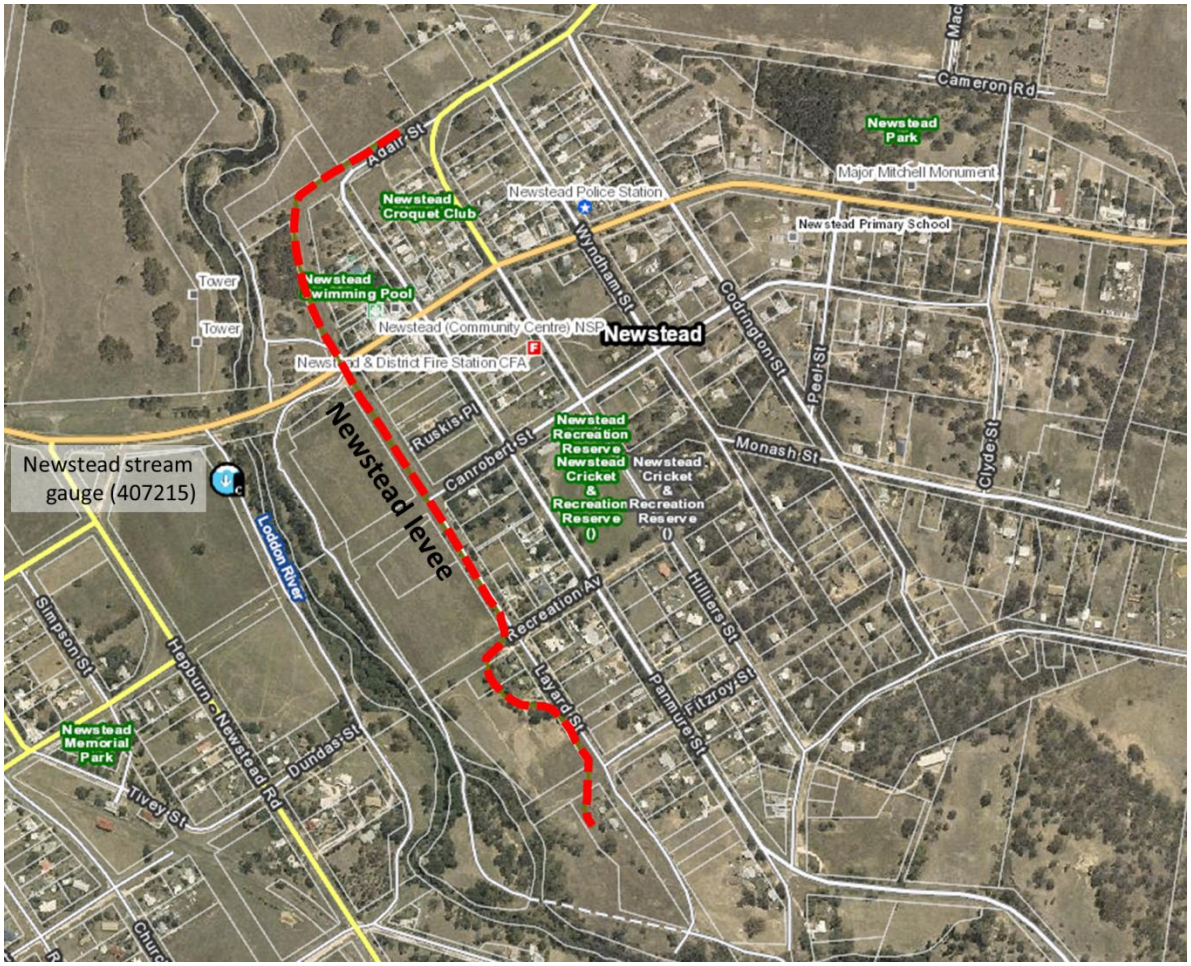
- Pyrenees Highway
- Adair Street
- Maldon – Newstead Road

Flood impacts on these roads during smaller flood events are unknown. The collation of anecdotal information will help to inform the likely impacts during smaller flood events.

Municipal assets are listed in the Municipal Emergency Management Plan

Flood Mitigation

The township of Newstead has a long history of flooding and as a result, a levee bank was built in 1912. Refer to image below showing the town levee (red dashed line). Although there is no formal agreement for who is responsible for the levee, the Mount Alexander Shire Council will undertake maintenance on the levee bank when required. While the formal protection level of the levee is unknown, the levee has protected the town during recent flood events; September 2010, September 2016 and January 2011 (the largest event, to 5.86 m on the Newstead gauge).



Aerial photo showing the Newstead town levee (red) and the Loddon River at Newstead stream gauge (407215)

The Newstead levee before the flood peak during the January 2011 event (source Mt Alexander Shire).

Left, the Newstead levee before the floodwater has arrived. Right, local residents working to raise the Newstead levee before the flood peak during the January 2011 event (source Mt Alexander Shire).

Flooding in Newstead along the Loddon River during the September 2010 flood event.

Flood Impacts and Required Actions

Pre-planning is needed to ensure leaders in the community (potentially the CFA brigade) have adequate sandbags, road signs, etc needed in the event that Newstead is isolated during a flood event.

Newstead Flood Intelligence Card

Loddon River at Newstead gauge 407215

Flood travel time							Time from start of rain to steep rise in floodwater 2 - 4 hours Time between Vaughan and Newstead peak 6 hours Riverine flooding duration: 1 day	
Jim Crow Creek at Yandoit gauge height 407221 (m)	Loddon River at Vaughan gauge height 407217 (m)	Muckleford Creek at Muckleford gauge height 407300 (m)	Loddon River at Newstead gauge height 407215 (m)	Annual Exceedance Probability (AEP) DELWP database	Loddon River at Newstead Design Flow (ML/d) Floodzoom rating	Castlemaine and Campbells Creek damages total number properties flooded (above floor)	Consequence/ Impact	Action **Actions may include: Evacuation, closure of road, sandbagging, issue warning and who is responsible etc.**
				1% AEP			The flood extent map (which has low accuracy) shows that the town levee is breached during a 1% AEP flood event. Potentially x81 buildings could be subject to flooding (within the flood extent). x5 buildings may be isolated (refer to flood extent map). Potential impacts on infrastructure may include: Newstead Tennis Club, Recreation Reserve, CFA building, Crown Hotel, Newstead Swimming pool. Dig Café, Bank, Visitor Information Centre, IGA supermarket, butchers and other small business. Town Walking tracks, town sewerage system. Properties that may be impacted above or below floor include: 35 Campbell Street, 1A and 2B Dundas Street, x9 Panmure Street (2, 8, 12, 24, 28, 30, 32, 34A, 36, 57) and 1 Layard Street.	
3.21	4.38	4.12	5.89	January 2011	60,909		The Newstead levee protected the town during the January 2011 flood event. Buildings impacted by flooding include: a public toilet at Newstead Park and the Newstead Racecourse. Roads that were impacted by flooding include: Cameron Road and Clyde Street, north of Lyons Street.	
3.22	3.96	3.56	5.68	September 2016	52,040		Council reported roads impacted by floodwater: Daylesford – Newstead Road, Church Street, Cemetery Road (at the Muckleford Creek crossing), the eastern section of Layard Street (east of the levee), Clyde Street and Cameron Road was impassable where they intersect Mia Creek. Access/egress was cut to a house; 10 Brights Road due to flooding along Butlers Creek (5km west of Newstead), a section of the road was washed away due to flooding.	Flooding along the Loddon River cuts the Pyrenees Highway, Upon notice or via inspection Council may deploy “water over road” signs where needed. VicRoads to respond in accordance with their road management plan. – *Road Management Plan : VicRoads* Sandbag/reinforce the levee where needed.
			5.63	November 2010	49,235			
			5.60	Major	48,300			
2.86	3.27	3.56	4.91	September 2010	25,843			
2.86	3.38	3.28	4.78	October 2016	23,918			

			4.50	Moderate	21,034		Flooding along the Loddon River may Newstead in half at the Pyrenees Highway bridge (unsure at what flood magnitude the bridge is impassable).	
			3.00	Minor	8,750		Levee parallel to Layard street, protection level and owner unknown. Levee has stopped the town from flooding several times. Council maintain the levee as needed.	

Appendix C3: Baringhup (downstream of the Cairn Curran Reservoir) Flood Emergency Plan

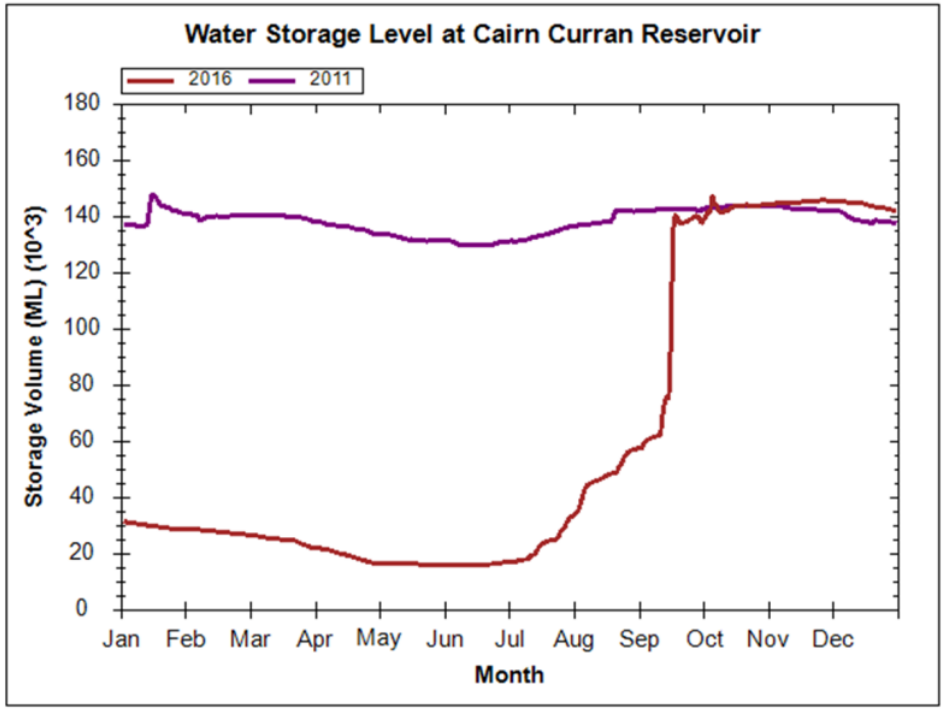
Overview of Flooding Consequences

Given Baringhup is located immediately downstream of the Cairn Curran Reservoir, this storage has a significant impact on the likelihood of flooding in Baringhup. The Cairn Curran Reservoir (storage capacity 147,130 ML, Full Supply Level (FSL): 208.46 m AHD) managed by Goulburn Murray Water, provides significant flood mitigation, attenuating the flood flows. Low storage levels in Cairn Curran not only significantly reduce the magnitude of the flood event at Baringhup, but can also prevent a flood from occurring. However, high storage water levels in Cairn Curran, similar to the January 2011 flood event will;

- Reduce available storage,
- Increase the likelihood of flooding occurring at Baringhup and
- Reduce the travel time of the flood peak.

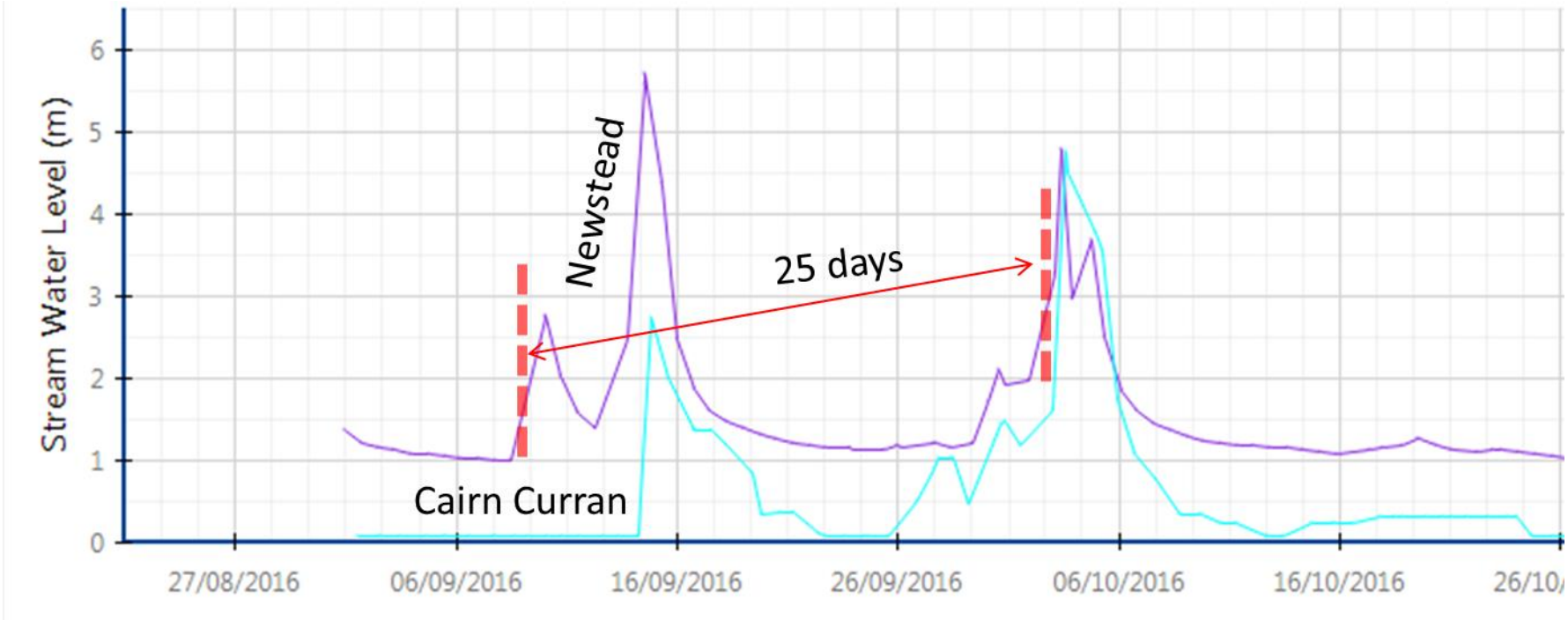
Refer to the Goulburn Murray Water website link for current Cairn Curran Reservoir storage levels: https://www.g-mwater.com.au/water-resources/catchments/storages/loddon/cairncurranreservoir

Early September 2016 when steep rises in flood levels were recorded in Newstead, Cairn Curran's storage capacity was 37% (refer to figure of storage levels below). Low storage levels in the Cairn Curran Reservoir mitigated flooding from occurring in Baringhup.



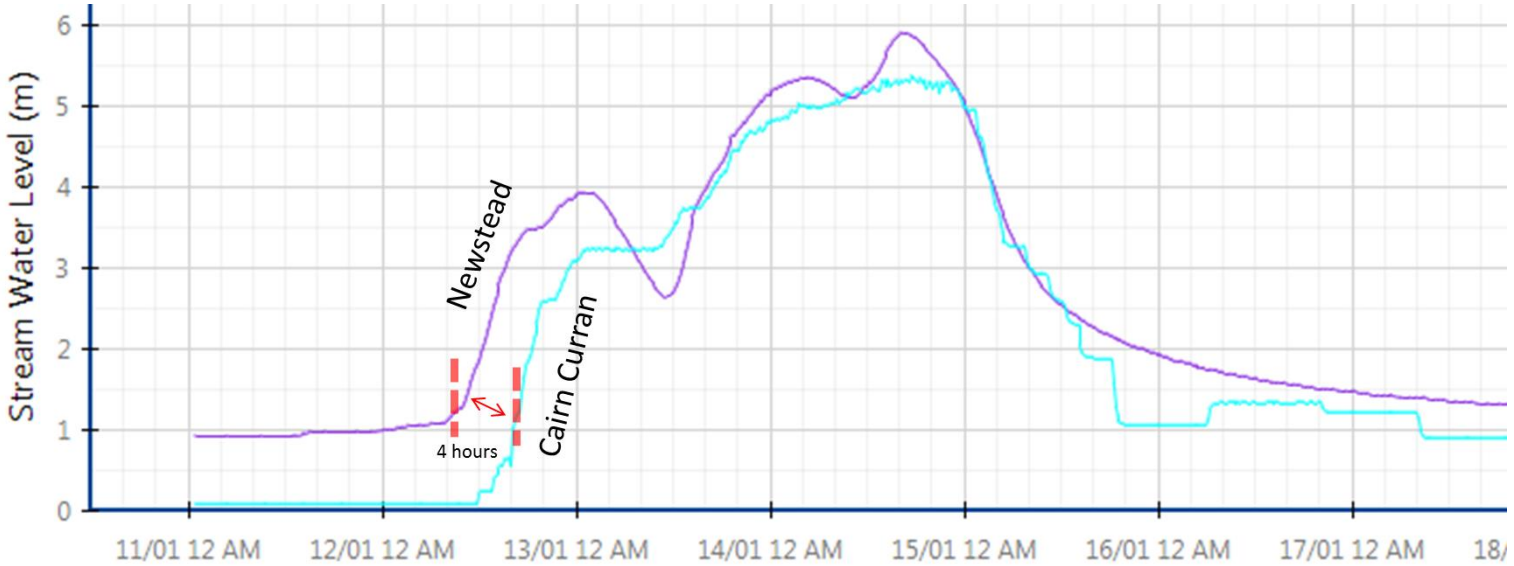
Cairn Curran Reservoir storage levels during 2011 and 2016.

Significant inflows into the Cairn Curran storage over 25 days caused the Cairn Curran Reservoir to spill on the 3rd of October (refer to figure below).



Loddon River flows at the Newstead gauge (purple) and Cairn Curran gauge (blue) during the 2016 flood event.

However during January 2011, because the Cairn Curran was close to full at the start of the flood event, the travel time between the Newstead and the Cairn Curran gauge was only 4 hours.

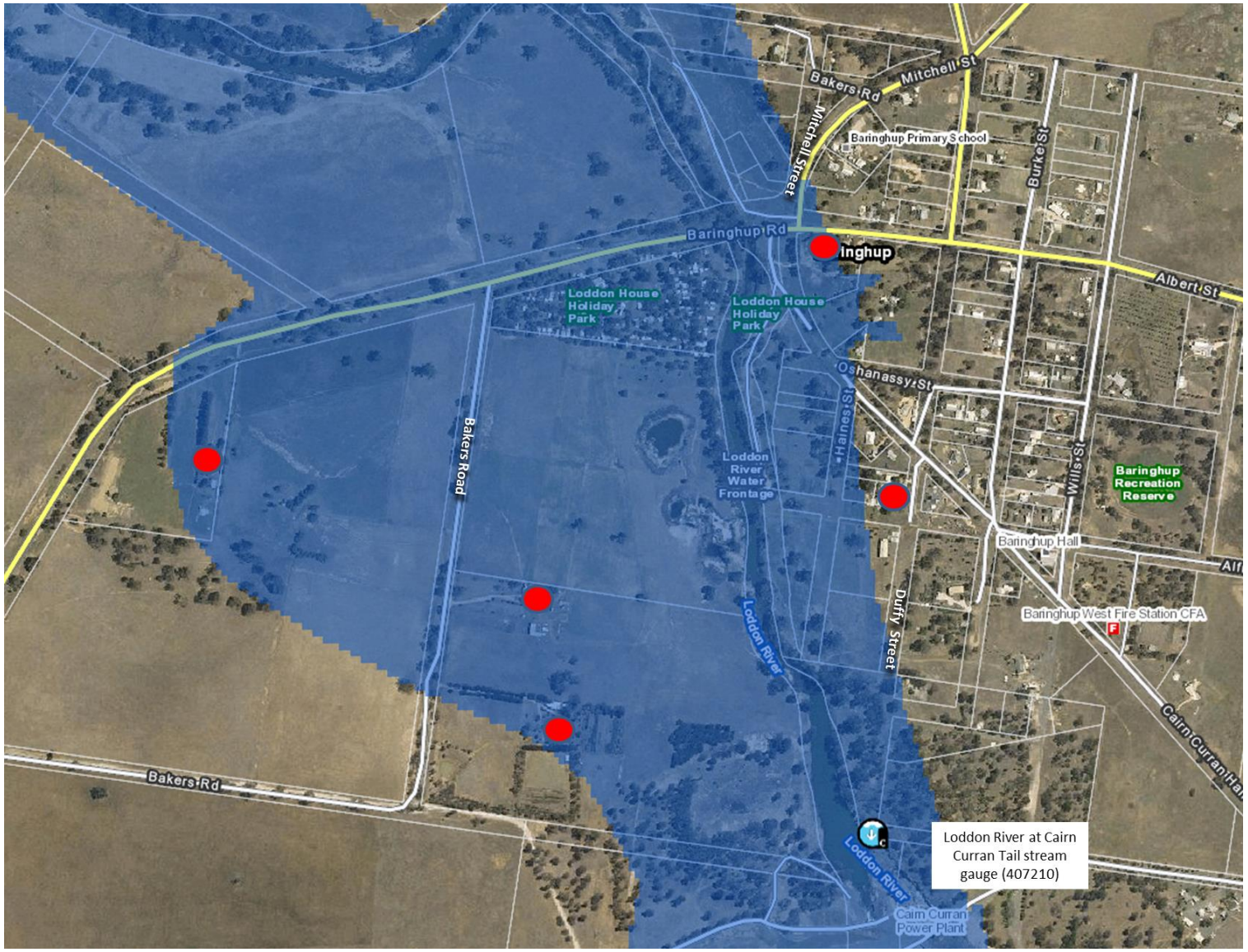


Loddon River flows at the Newstead gauge (purple) and Cairn Curran gauge (blue) during the 2011 flood event.

Cairn Curran reservoir spilling during the January 2011 flood event (source Fortuna Fire Brigades Group).

The Loddon House Holiday Caravan Park impacted by flooding during the October 2016 flood event (source: Mt Alexander Shire)

Aerial photo of the Loddon House Holiday Caravan Park, showing the area impacted by flooding (shaded blue) during the October 2016 flood event.



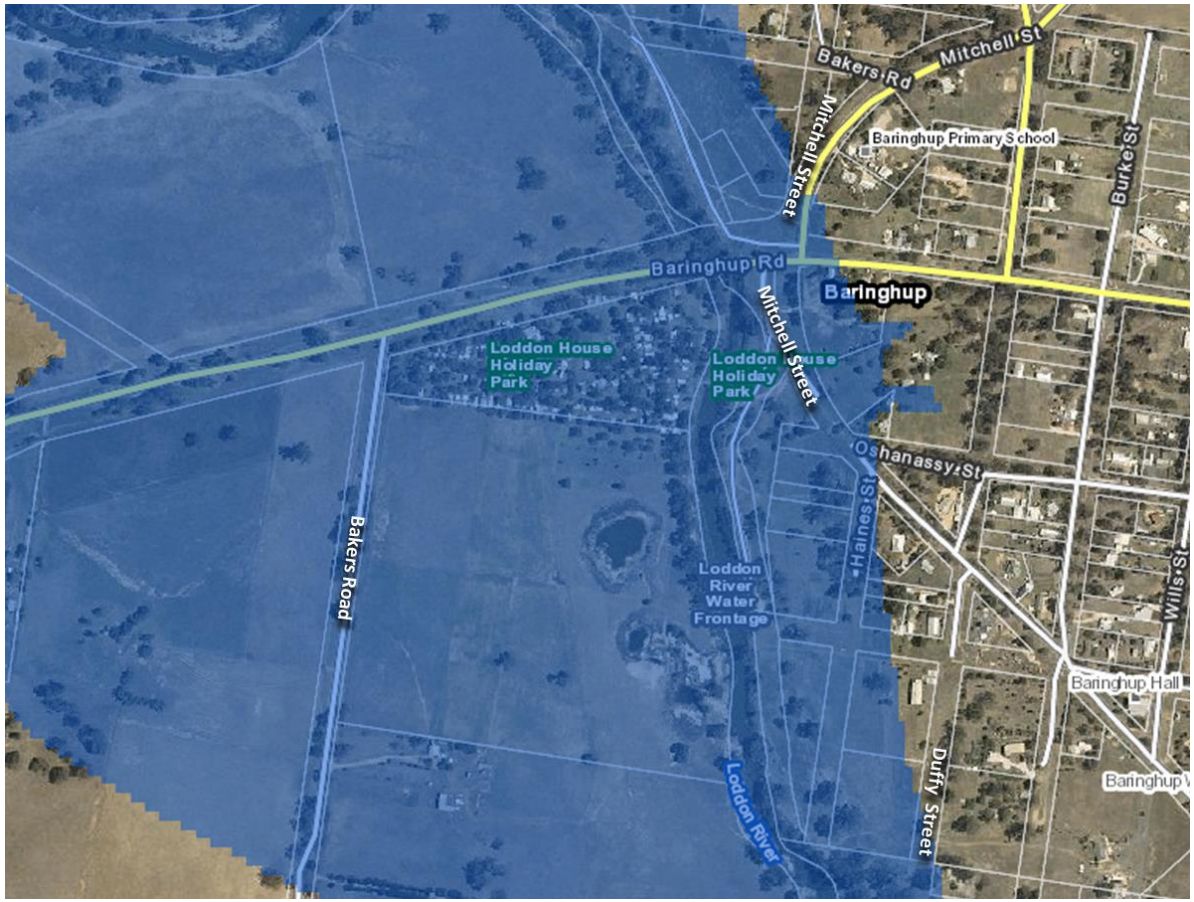
Aerial photo of Baringhup, showing the area impacted by flooding (shaded blue) during a 1% AEP flood event. Red dots indicated properties recoded by council to be impacted by flooding.

Roads Impacted by flooding

The western section of Baringhup is cut in half by flooding along the Loddon River. Roads impacted by flooding during 1% AEP flood event include;

- Baringhup Road
- Bakers Road
- Mitchell Street
- Oshanassy Street
- Haines Street
- Duffy Street

Refer to the map below showing roads impacted by flooding during a 1% AEP flood event.



Roads damage from the October 2016 flood event recorded by the Mt Alexander Shire includes;

- 163 Douglas Road, Baringhup, deck damage to the bridge and sides of the bridge washed away
- 243 Hayes Road, Baringhup, unsealed road surface was washed away
- Simmonds Road, Baringhup, debris build up (including trees) under the bridge, side of the road washed away

Bus route disruption

The regional school bus route (source from Floodzoom) shown in red on the map below indicates that the during a 1% AEP flood event a road that may be impacted includes;

- Baringhup Road (main road between Carisbrook and Maldon).

Although the (North Central CMA) 1% AEP flood event map below shows flooding adjacent to Baringhup Road, there is uncertainty if this flooding cuts access to any section of this road/bridge.

Flood mitigation

AEP Event	Properties Affected	Number of properties	Description of risk
1% AEP event	**Commercial / Residential**	1 caravan park. x3 houses and x1 shed	Within the 1% AEP flood extent (low accuracy) shows 3 houses (625 Baringhup Road and 2 houses along Bakers Road immediately downstream of the Cairn Curran Reservoir) and 1 shed (521 Albert Street) may be subject to flooding in addition to the Loddon House Holiday Caravan Park. Refer to the 1% AEP flood extent map below.
October 2016	**Commercial / Residential**		8 cabins in the Loddon House Holiday Caravan Park were damaged by flooding. Refer to the flood extent map for the October 2016 flood event below.

Asset register – Municipal assets are listed in the Municipal Emergency Management Plan

Baringhup (downstream of the Cairn Curran Reservoir) Flood Intelligence Card

Loddon River at Cairn Curran Reservoir Tail gauge 407210

Flood travel time					Flooding dependant on Cairn Curran Reservoir storage levels Time between Cairn Curran spill and steep rise in floodwater at Baringhup 30 minutes Riverine flooding duration: 4 days (January 2011)	
Loddon River at Newstead gauge height 407215 (m)	**Loddon River at Cairn Curran Reservoir Tail gauge height 407210 (m)**	**Annual Exceedance Probability (AEP) DELWP database**	**Loddon River at Cairn Curran Tail Gauge Design Flows (ML/d) Floodzoom rating**	**Baringhup damages total number properties flooded (above floor)**	**Consequence/ Impact**	**Action Actions may include: Evacuation, closure of road, sandbagging, issue warning and who is responsible etc.**
	5.40	January 2011	80,000	> (9)	Approximately 80,000 ML /day spilled from the Cairn Curran Reservoir over a two week period. More than 8 caravans' sustained damage and residents were evacuated from the Loddon House Holiday Park in Baringhup, downstream of the Cairn Curran Reservoir.	Evacuate the Loddon House Caravan Park
	5.00		51,717			
	4.80		43,083			
	4.77	October 2016	41,984	(9)	8 caravans' sustained damage and residents were evacuated from the Loddon House Holiday Park in Baringhup, downstream of the Cairn Curran Reservoir. Also a house at 42 Duffy Street was flooded above floor.	Evacuate the Loddon House Caravan Park
	4.50		33,246			
5.60	4.00	Major	23,100			
4.50	3.50	Moderate	16,500			
3.00	2.00	Minor	6,200		Flows in the Loddon River, downstream of Cairn Curran Reservoir are dependent on the storage levels. Storage capacity of Cairn Curran Reservoir is 147,130 ML. Close communication with the storage manager Goulburn Murray Water is essential to determine when a spill is likely.	

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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain

Appendix C4: Regional Towns (Metcalfe, Guildford, Muckleford, Elphinstone, Walmer, Taradale, Harcourt, Redesdale, Maldon) Flood Emergency Plan

Currently there is no regional mapping available to inform the likely flood impacts for this region. Anecdotal flood impact information provided by council for historic flood events has been used to highlight areas impacted by flooding. Refer to the table below.

Flood travel time	Time from start of rain to steep rise in floodwater 2 - 4 hours
	Time to peak 3 - 6 hours
	Riverine flooding duration: 1 day

Location	Annual Exceedance Probability (AEPI) DELWP database	Damages total number properties flooded (above floor)	Consequence/ Impact	Action Actions may include: Evacuation, closure of road, sandbagging, issue warning and who is responsible etc.
Harcourt	September 2016		Road damage recorded at road crossings; Market Street and Reservoir Road.	?
Maldon	September 2016		Road damage recorded at road crossings; Preeces Lane and Skinners Flat – Mt Kerang Road.	?
Guilford	September 2016		The backyard of a property was flooded at 5 Templeton Street.	?
Redesdale	September 2016		Road damage recorded at road crossings; Pattersons Road, Myrtle Creek Road, Sutton Grange-Redesdale Road.	?
Elphinstone	September 2016	1	A house at 64 Buntins Road was impacted by flooding. Road damage recorded at road crossings; Bendigo – Sutton Grange Road, Finnings Road, Barber Road, Jennings Hill Road and Pollards Road.	?
Metcalfe	September 2016	(2)	A house and shed at 41 Metcalfe Redesdale Road, Metcalfe were damaged by floodwater during the September 2016 flood event (refer to photos below). Road damage recorded at road crossings; Coliban Park Road, Gradys Road, Kyneton –Metcalfe Road, Metcalfe Malmsbury Road, Rose Hill Road, .	?
Walmer	September 2016		Road damage recorded at road crossings; Mount Gaspard Road, Fogartys Gap Road, Neilsons Lane, Neilsons Lane, Davies Road and Carpenter Lane.	?
Muckleford	September 2016		The backyard fence was damaged by flooding at 149 Creasys Road. Road damage recorded at road crossings; Muckleford School road, Butchers Road,	?
Taradale	2010	(2)	Flooding in Kangaroo Creek cut access/egress to houses located at; 34 Fryerstown Road, 58 Fryerstown Road. Also a house at the end of De La Beche Street/Jackson Street was flooded above floor in Taradale. Flooding was caused from Back Creek. The Mineral Springs Reserve playground was flooded to knee level.	House was sandbagged.
	September 2016		Flooding caused damage to the Mineral Springs Reserve playground and other council assets. Refer to flood photos below. Road damage recorded at road crossings; Sargeants Road, Old Coach Road to Fryer Ridge Road, Spring Creek Road,	?

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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain

A house and shed at 41 Metcalfe Redesdale Road in Metcalfe, damaged by floodwater during the September 2016 flood event.

Flood damage to the Mineral Springs Reserve, Taradale during the September 2016 flood event.

Flood damage to the Mineral Springs Reserve, Taradale during the September 2016 flood event.

Appendix D - Flood evacuation arrangements

Phase 1 - Decision to Evacuate

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

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 and 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;
- Is cross border assistance required or evacuation to another municipality relief centre?;
- Resources required and 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 ICC, working with flood specialists (NCCMA, Hydrologist etc.) will establish if predicted heights are triggers requiring consideration of evacuation

Phase 2 – Warning

Warnings may include a warning to 'prepare to evacuate' and a warning to 'evacuate now'. Once the decision to evacuate has been made, the at-risk community will be warned to evacuate. Evacuation warnings should be disseminated via methods listed in section 3.3 of this plan.

Phase 3 – Withdrawal

VICPOL is the responsible agency for evacuation. VICSES will provide advice regarding most appropriate evacuation routes and locations for at-risk communities to evacuate to.

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

VICPOL will control security of evacuated areas.

Evacuees will be encouraged to move using their own transport where possible. Transport for those without vehicles or other means will be arranged by the IC in consultation with other stakeholders (municipality, DHHS etc.)

Evacuation Routes to be used, will be determined by VICPOL in consultation with IC utilising appropriate intelligence and information from specialists.

Landing zones for helicopters (if possible) are located at:

- Camp Reserve, Cnr Forest & Gingell St Castlemaine
- Western Reserve, Forest St Castlemaine

Note: Other possible locations may be available upon consultation with Council

Special needs facilities are identified in Council's Municipal Emergency Management Plan.

Phase 4 – Shelter

Relief Centres and which cater for people's basic needs, may be established to meet the immediate needs of people affected by flooding. Relief centres are listed in the Municipal Emergency Management 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 relief centres. This can best be achieved through the Emergency Management Team (EMT).

Caravans

Caravans or caravan parks may be relocated upon consultation with IEMT (inc. municipality).

Phase 5 – Return

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

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

Considerations for deciding whether to evacuate include:

- Current 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, truck routes, water treatment plant affecting potable water supplies etc. Facilities & Essential Community Infrastructure can be located in the Municipal Emergency Management Plan

Appendix E: Flood warning and public information

Flood Warning

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

The most current details for Flood Warning and Public Information can always be found on EM-COP.

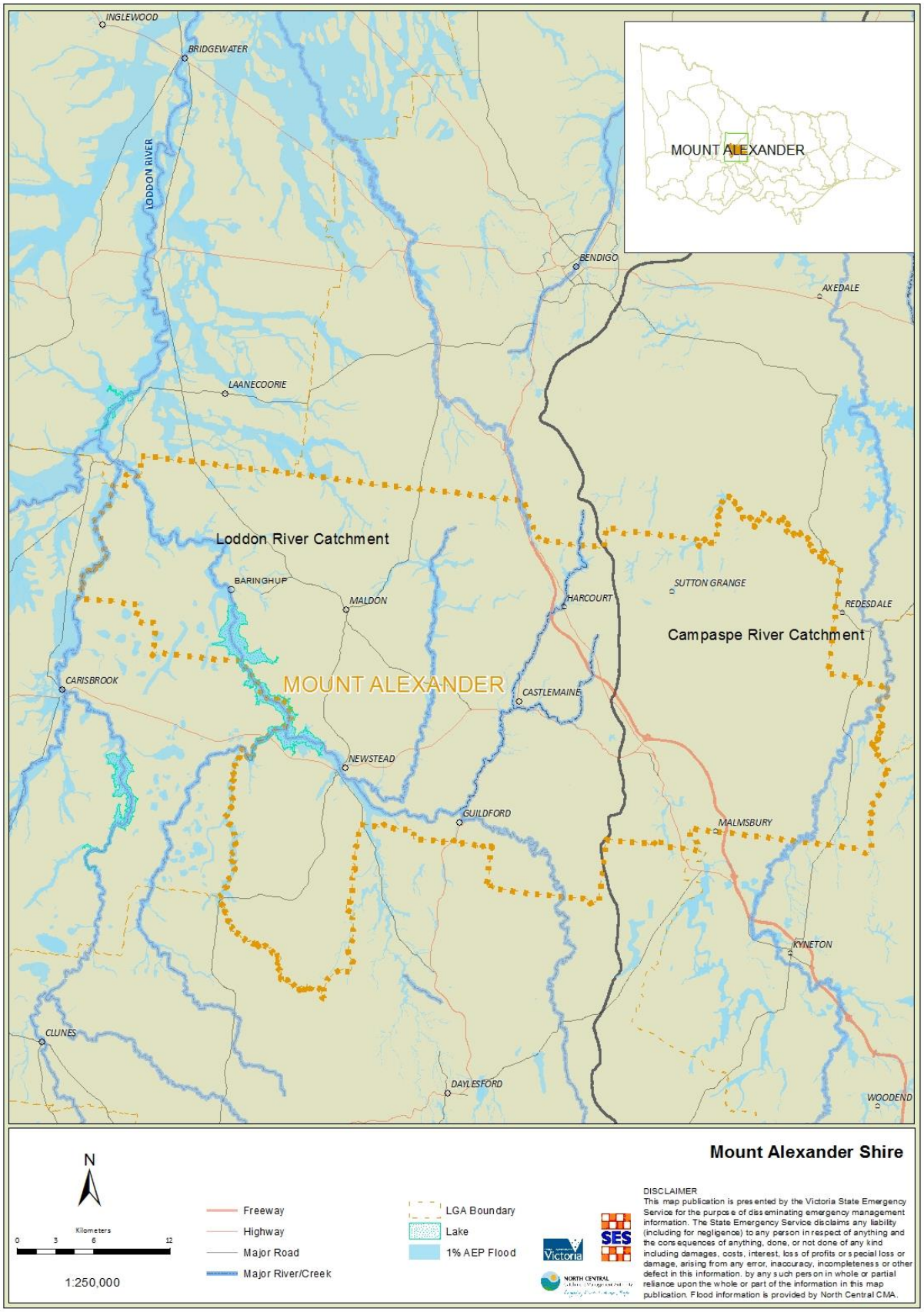
http://files.em.vic.gov.au/IMT-Toolbox/PubInf/InfoWarningsTools/BusinessRules/Infographic-FlashFlood.pdf

http://files.em.vic.gov.au/IMT-Toolbox/PubInf/InfoWarningsTools/BusinessRules/Infographic-Riverine%20Flood.pdf

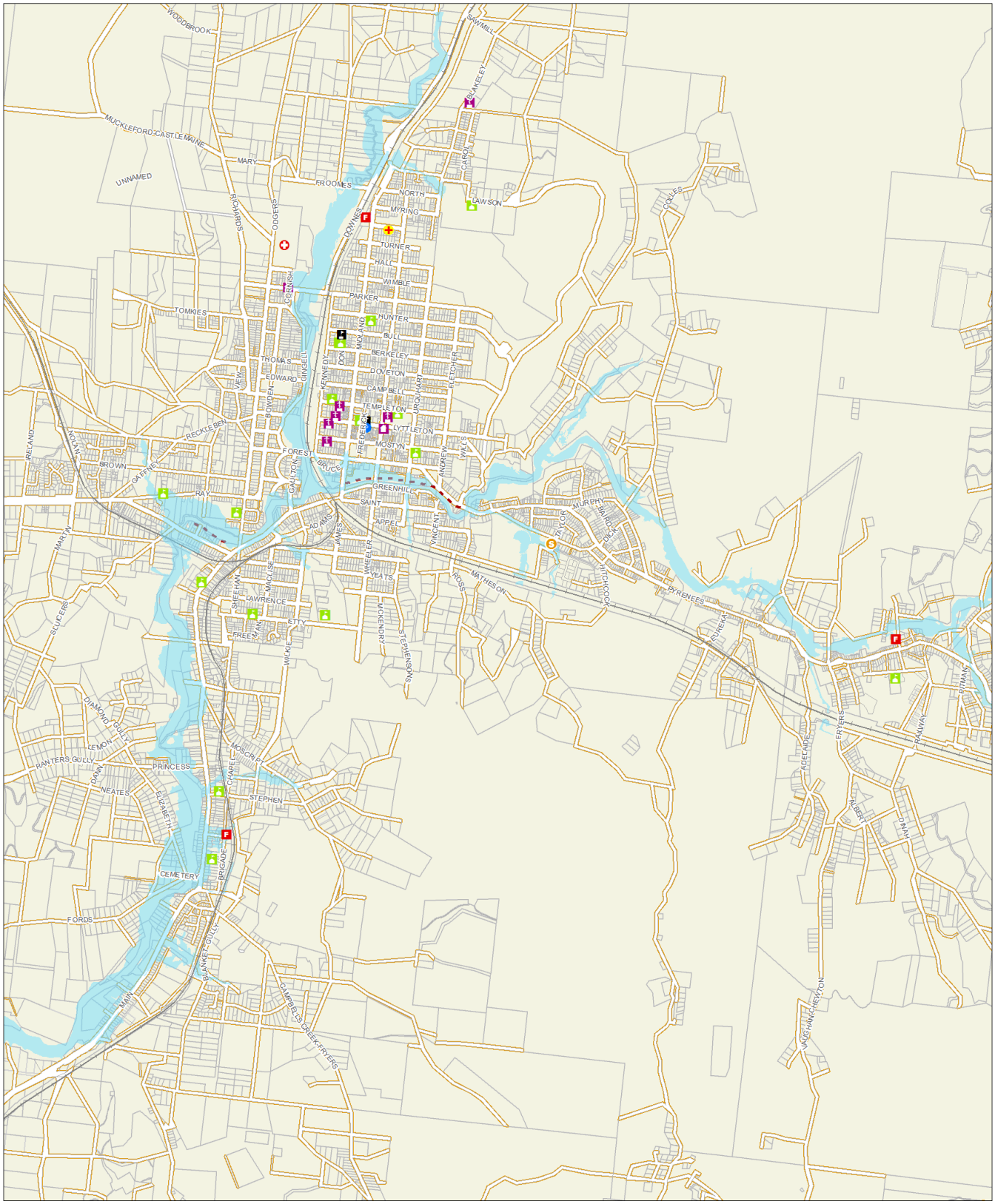
Instructions:

- Log in to EM-COP
- Click on the Library tab at the top of the page
- On the left hand collumn navigate to IMT Toolbox
- Expand IMT Toolbox and scroll down to IMTT-B-Public Information
- Click on Information and Warnings Tools
- Flash Flood and and Riverine Flood Infographics can be found under business rules

Appendix F: Maps and Schematics



MOUNT ALEXANDER SHIRE **CASTLEMAINE**



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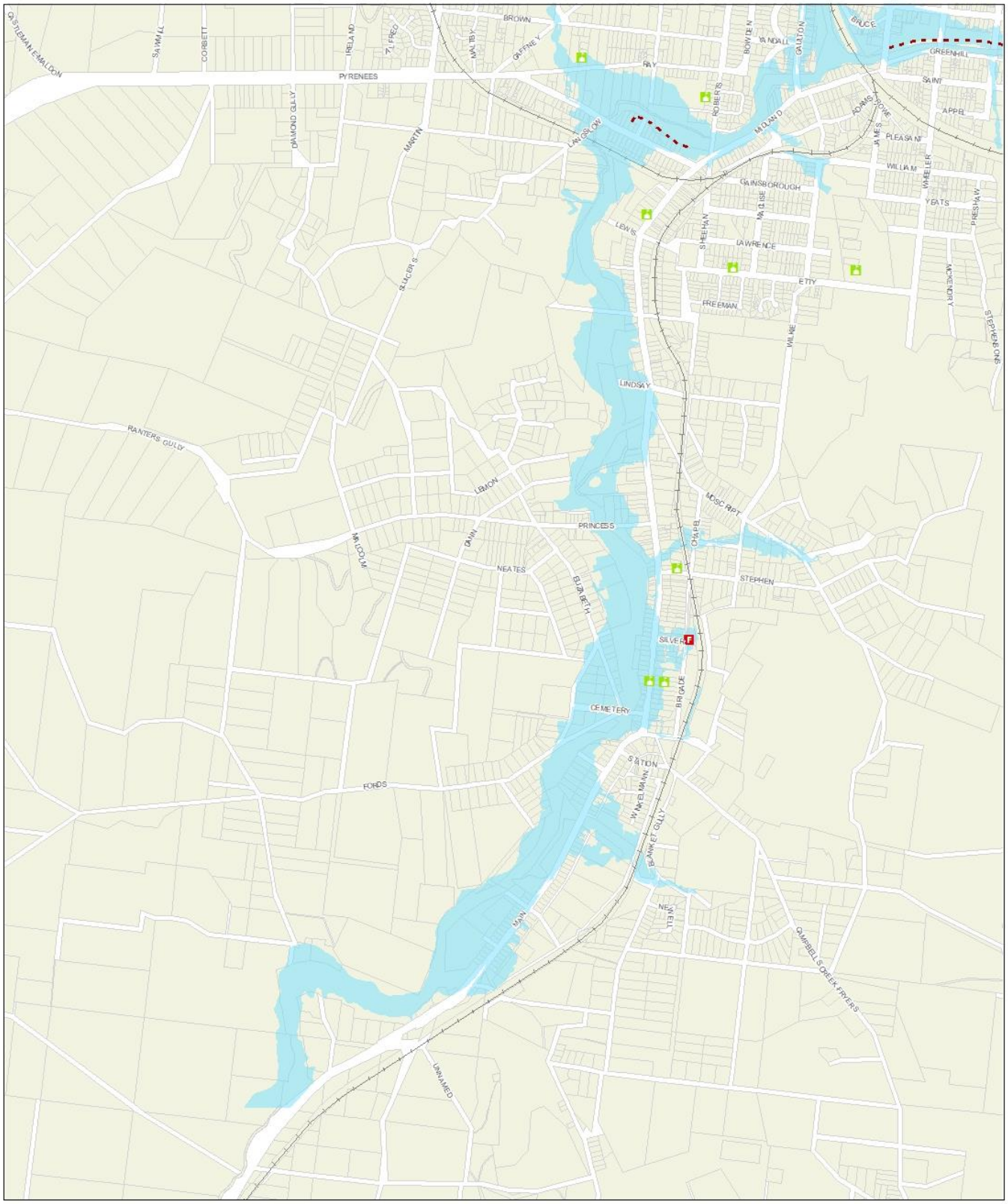
Map Produced: 23 June 2015

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 0.5% AEP Flood Extent
Campbells Creek



N

Scale at A4

0 0.175 0.35 Kilometers

1:15,000

- Ambulance Station
- Depot/Municipal Office
- Church
- Camp Ground
- Retirement/Aged Care
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- Police Station
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- SES Unit
- Road
- Rail Trail
- River/Creek
- Creek/Stream
- Levee
- Extent of Flood Data
- Township boundaries
- Cadastre
- 0.5% AEP Flood

SES

MOUNT ALEXANDER SHIRE COUNCIL

NORTH CENTRAL Catchment Management Authority

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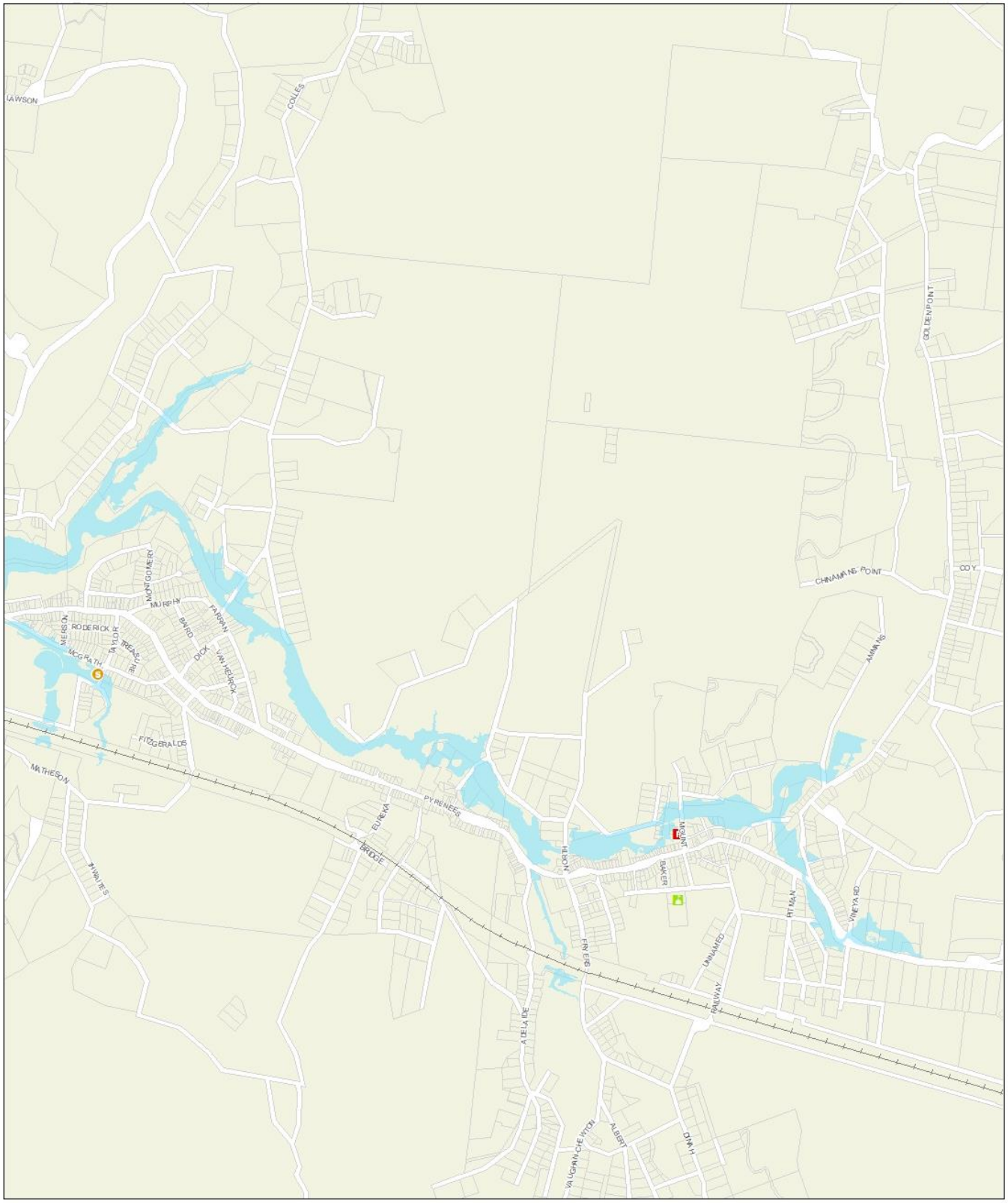
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 0.5% AEP Flood Extent
Forest Creek



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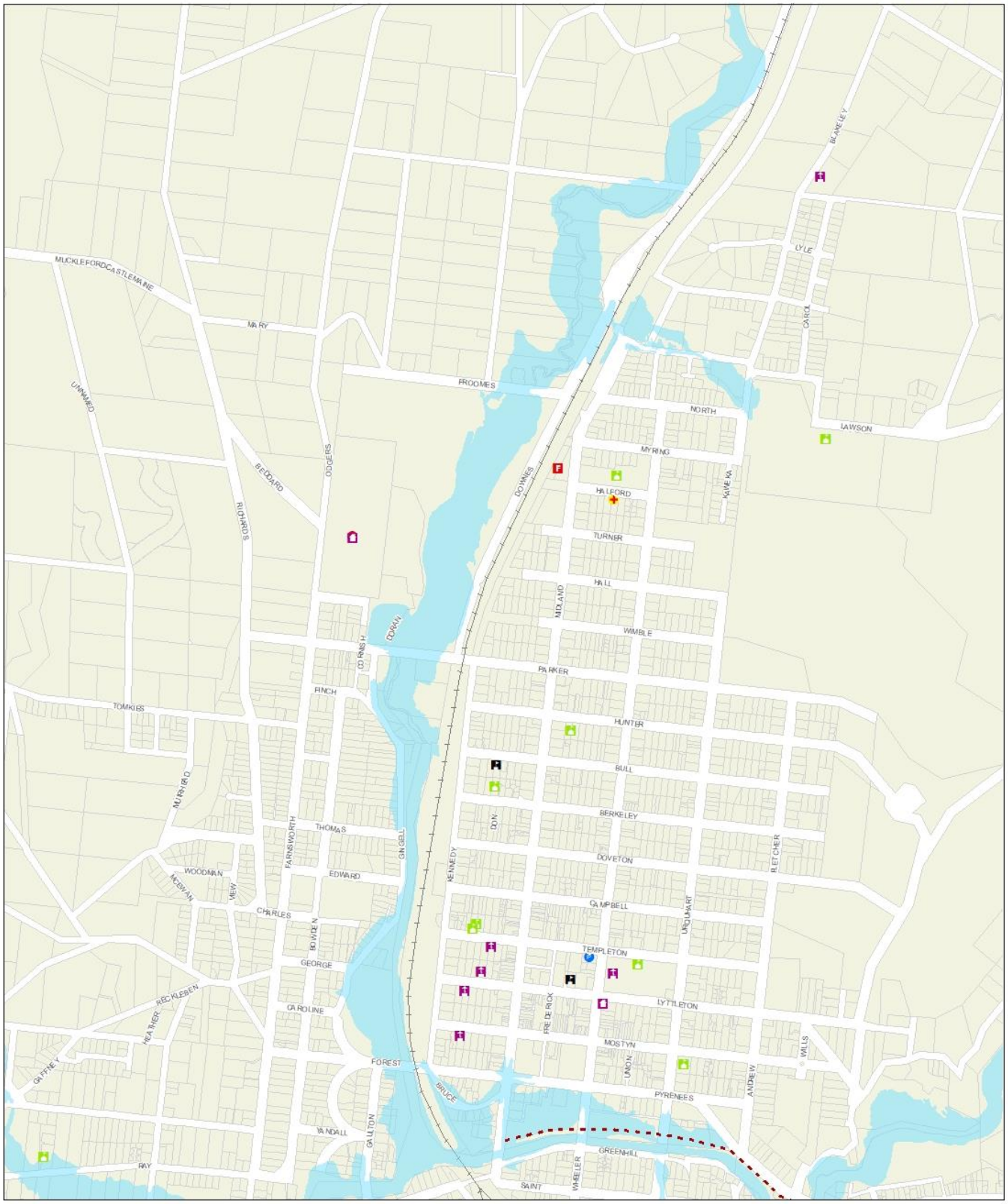
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 1% AEP Flood Extent
Barkers Creek



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Scale at A4

0 0.125 0.25 Kilometers

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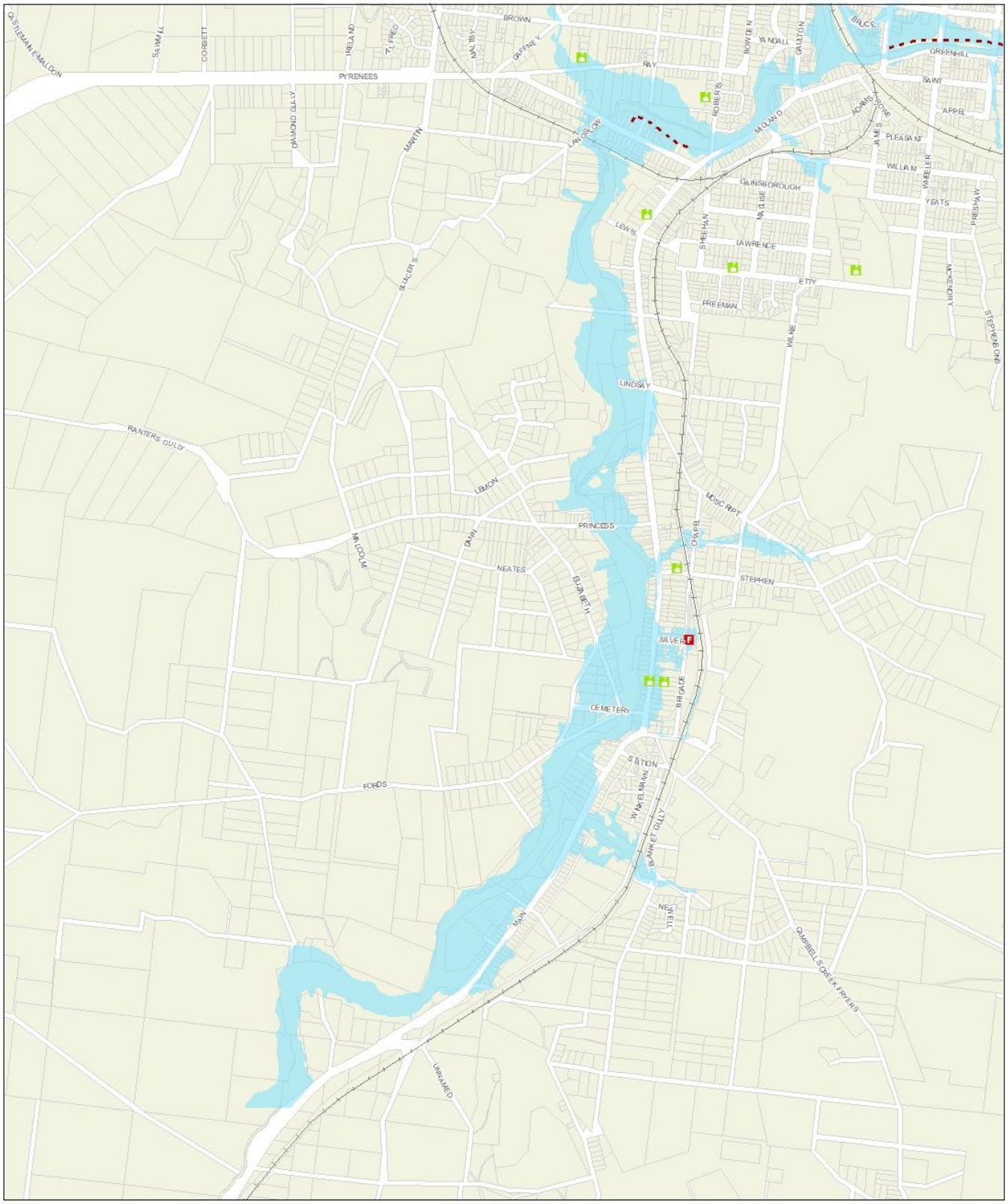
MOUNT ALEXANDER SHIRE

CASTLEMAINE - 1% AEP Flood Extent
Campbells Creek



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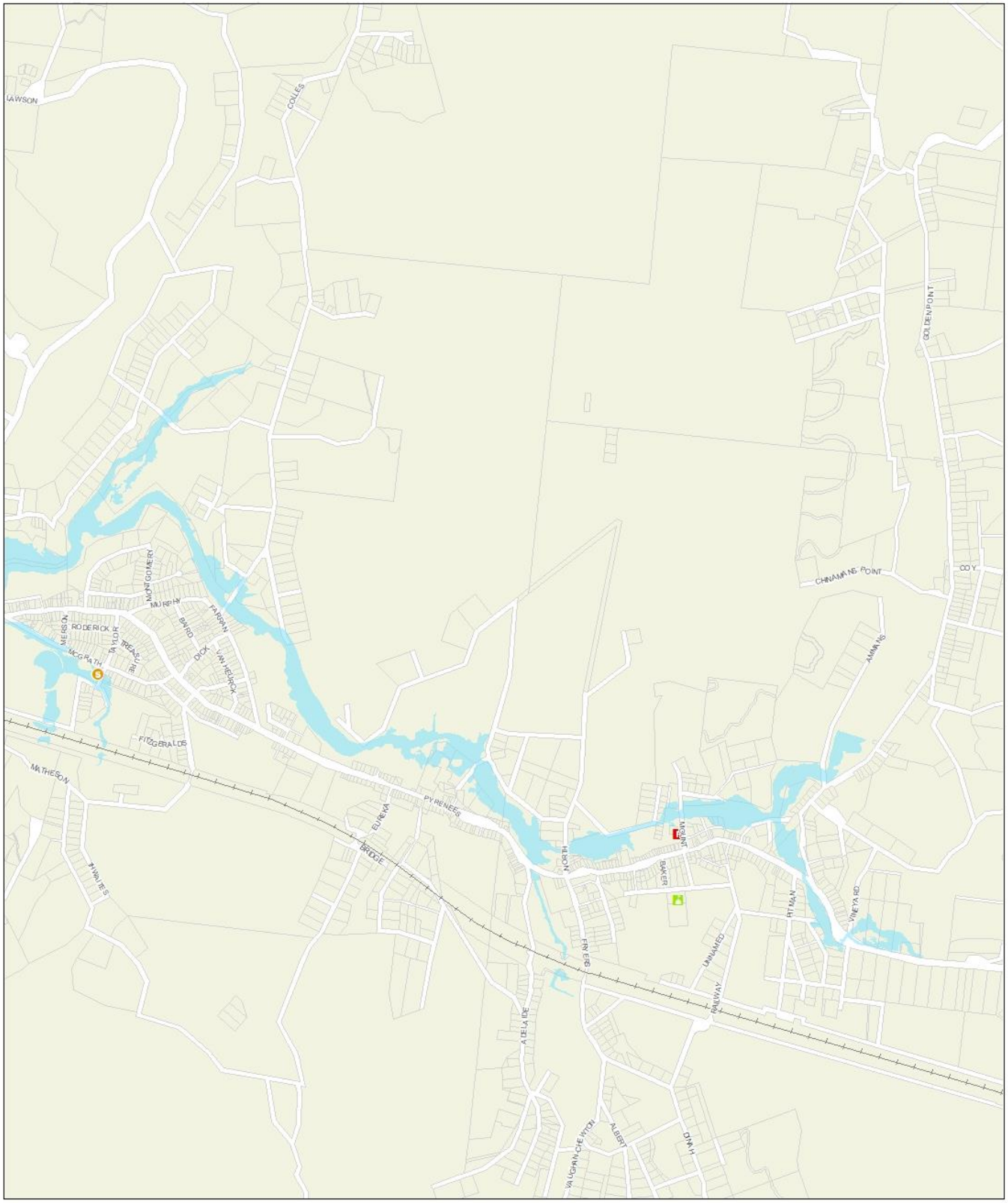
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 1% AEP Flood Extent
Forest Creek



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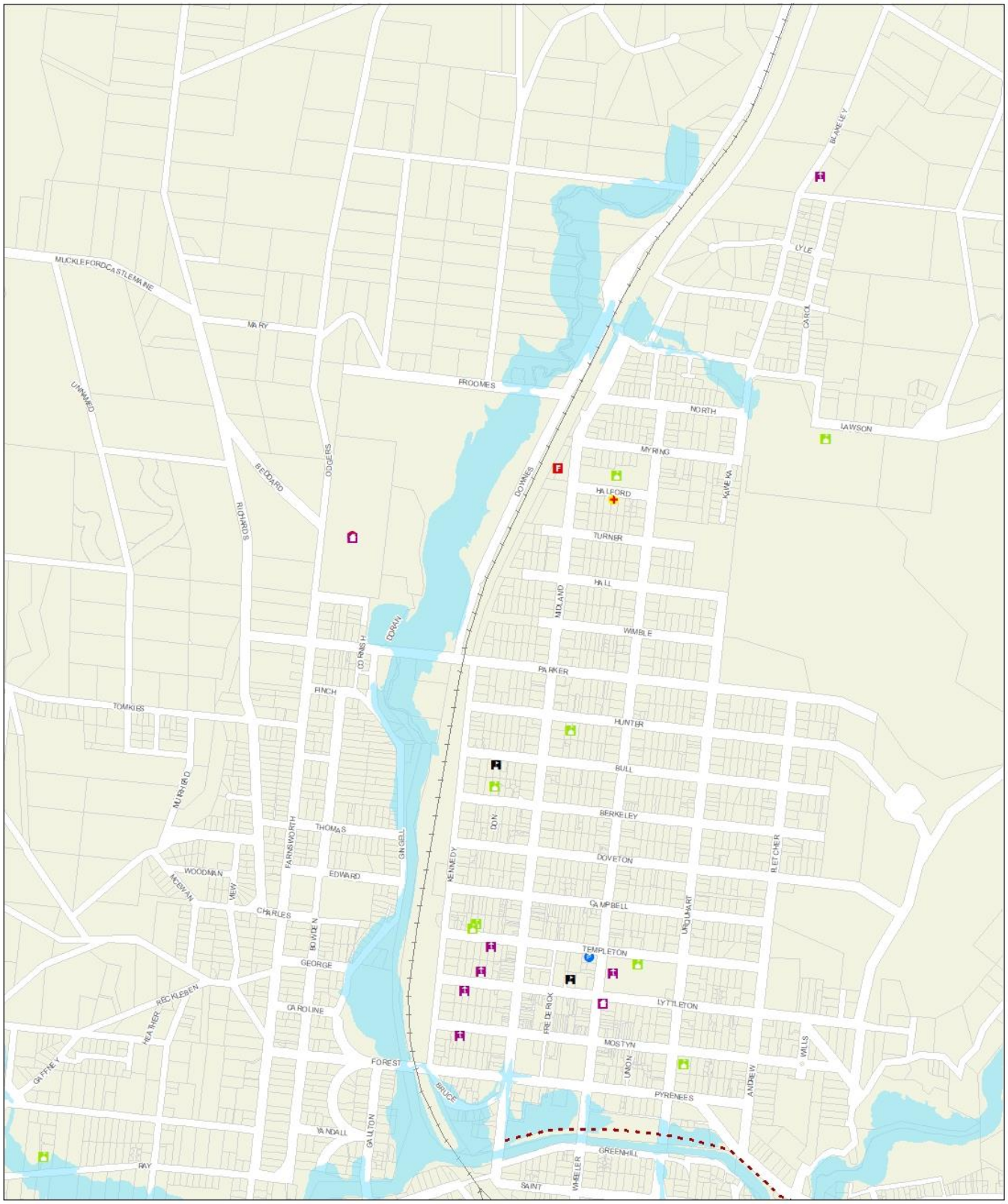
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 2% AEP Flood Extent
Barkers Creek



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Scale at A4

0 0.125 0.25 Kilometers

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SES

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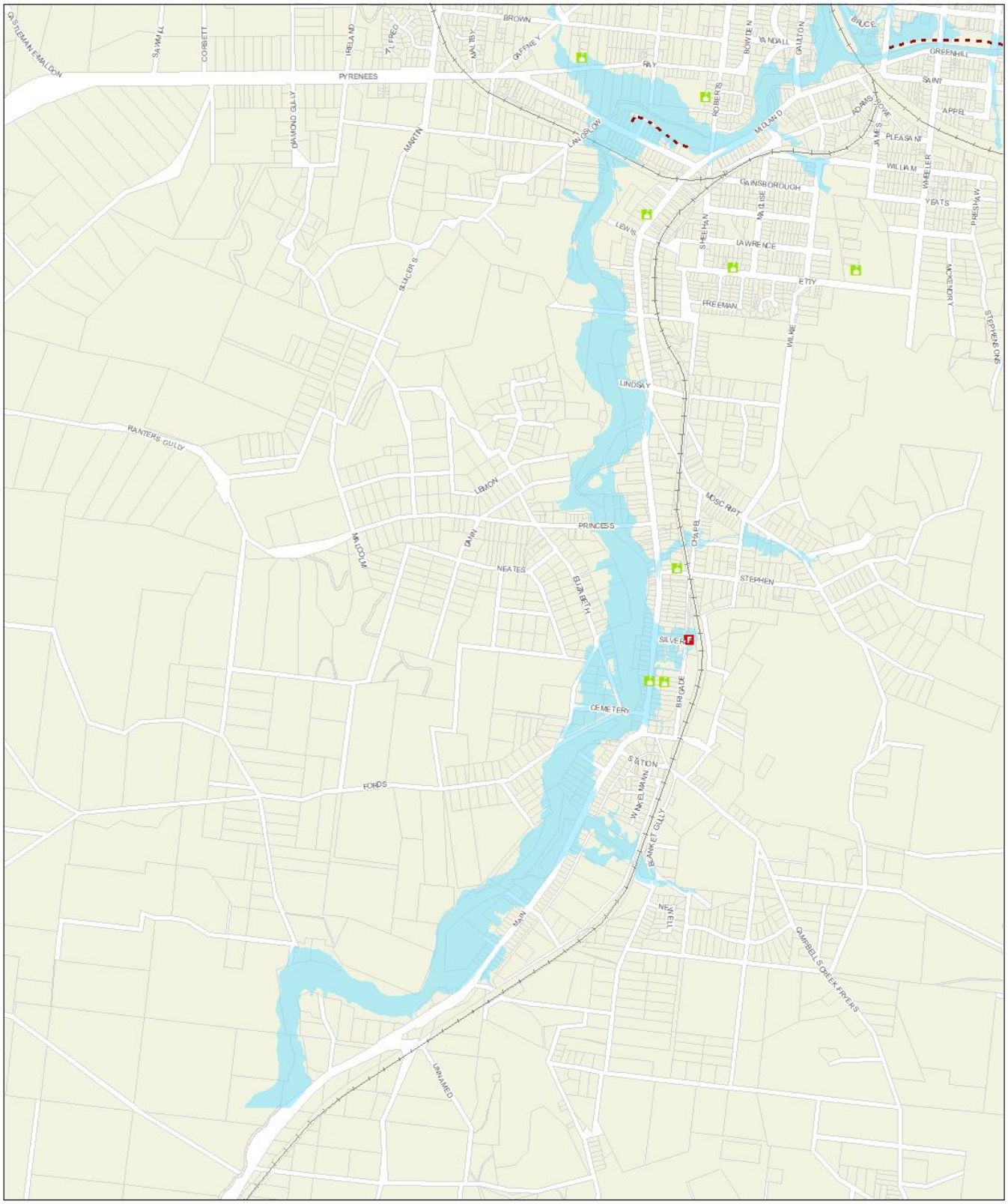
MOUNT ALEXANDER SHIRE

CASTLEMAINE - 2% AEP Flood Extent
Campbells Creek



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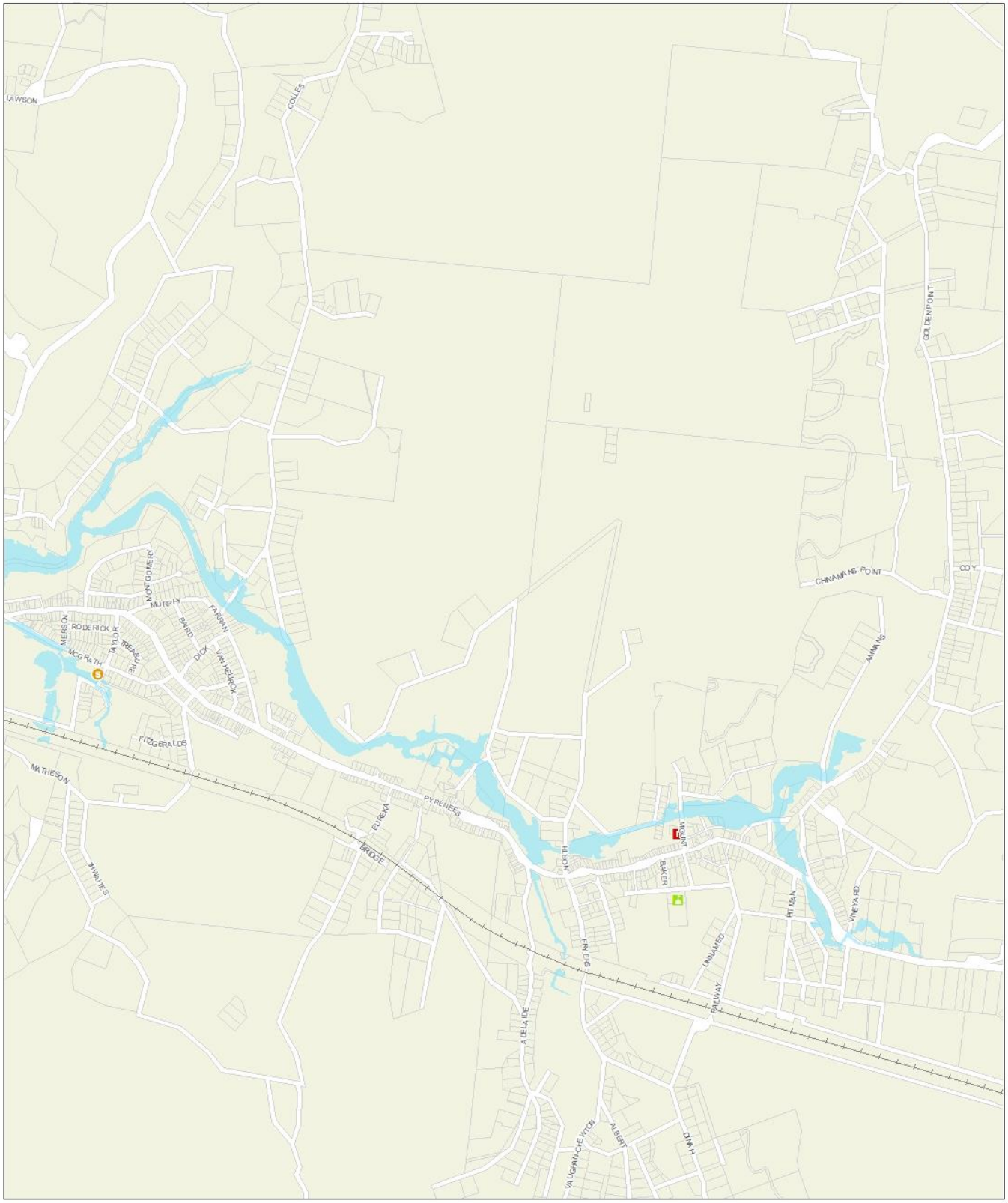
CASTLEMAINE - 2% AEP Flood Extent
Forest Creek



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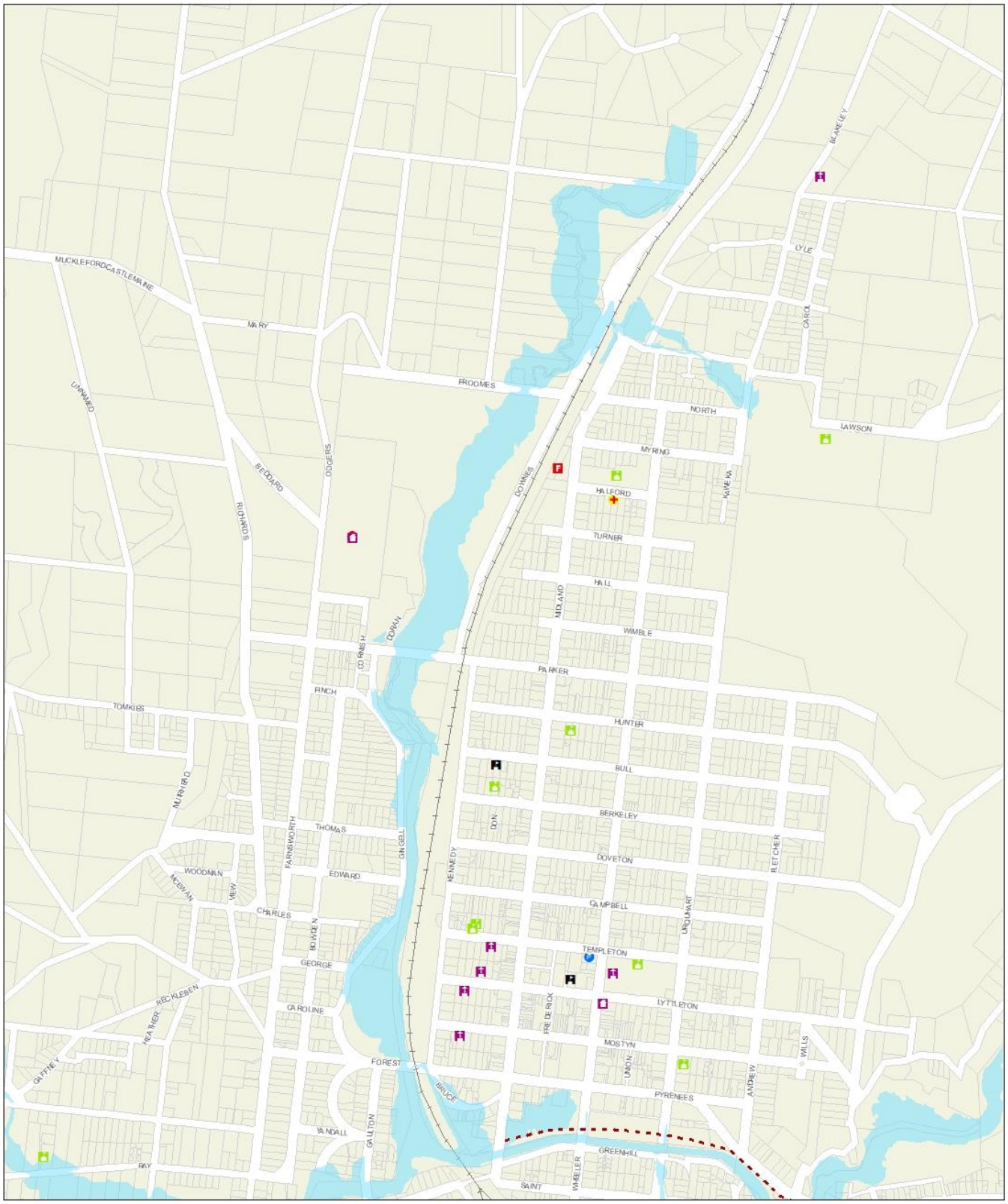
MOUNT ALEXANDER SHIRE

CASTLEMAINE - 5% AEP Flood Extent
Barkers Creek



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Scale at A4

0 0.125 0.25 Kilometers

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- 5% AEP Flood

SES

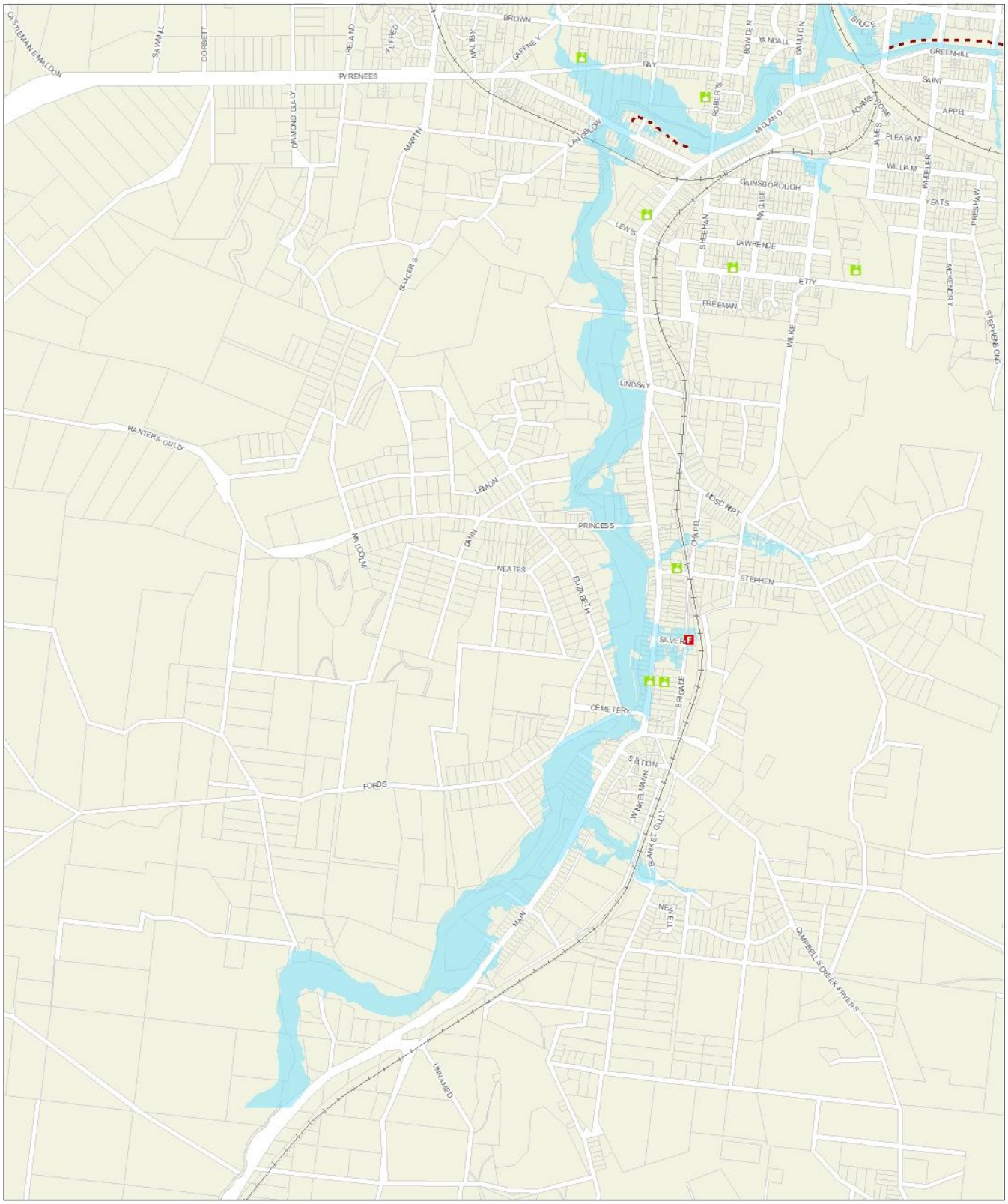
MOUNT ALEXANDER SHIRE COUNCIL

NORTH CENTRAL Catchment Management Authority

Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 5% AEP Flood Extent
Campbells Creek



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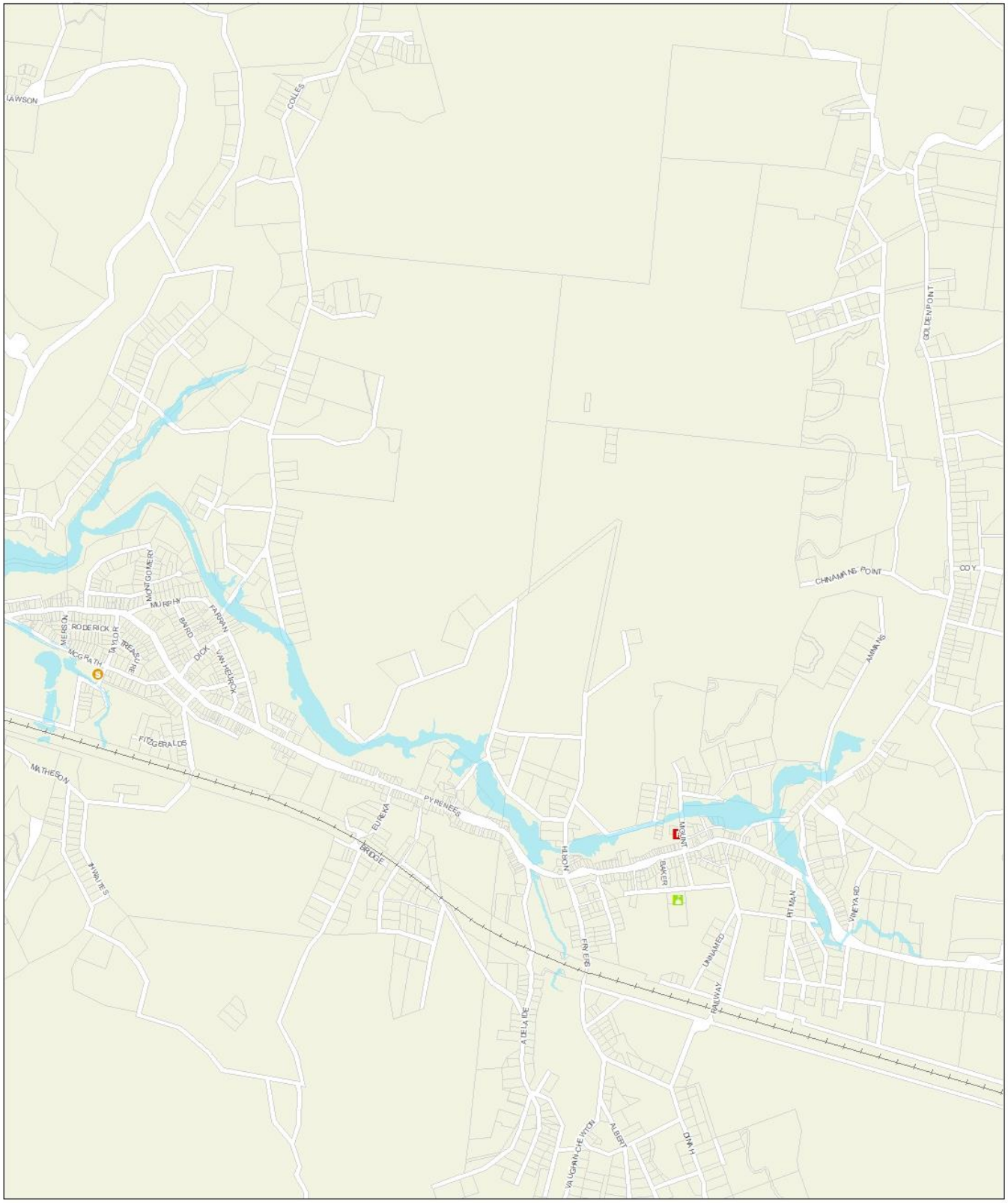
CASTLEMAINE - 5% AEP Flood Extent
Forest Creek



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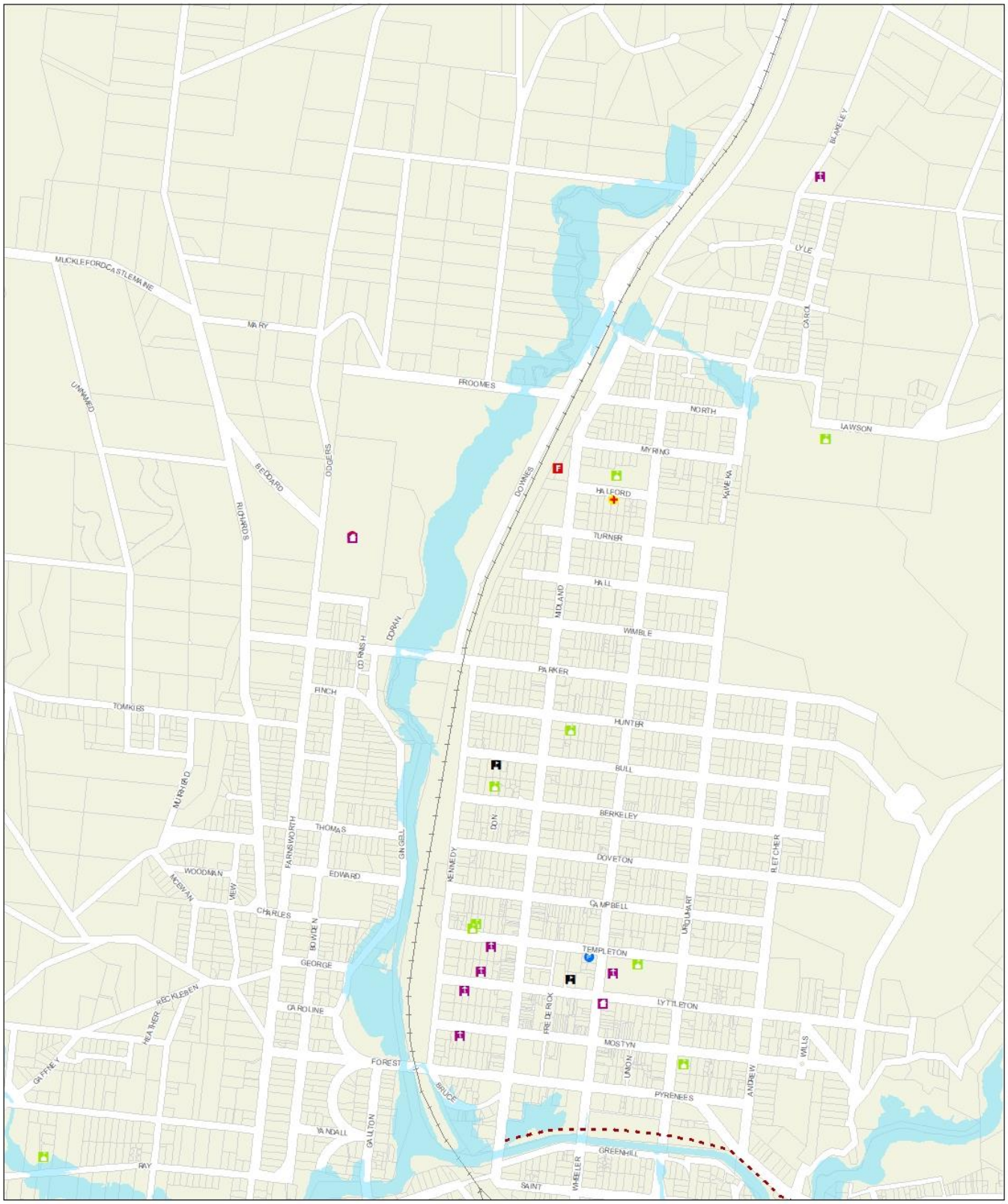
MOUNT ALEXANDER SHIRE

CASTLEMAINE - 10% AEP Flood Extent
Barkers Creek



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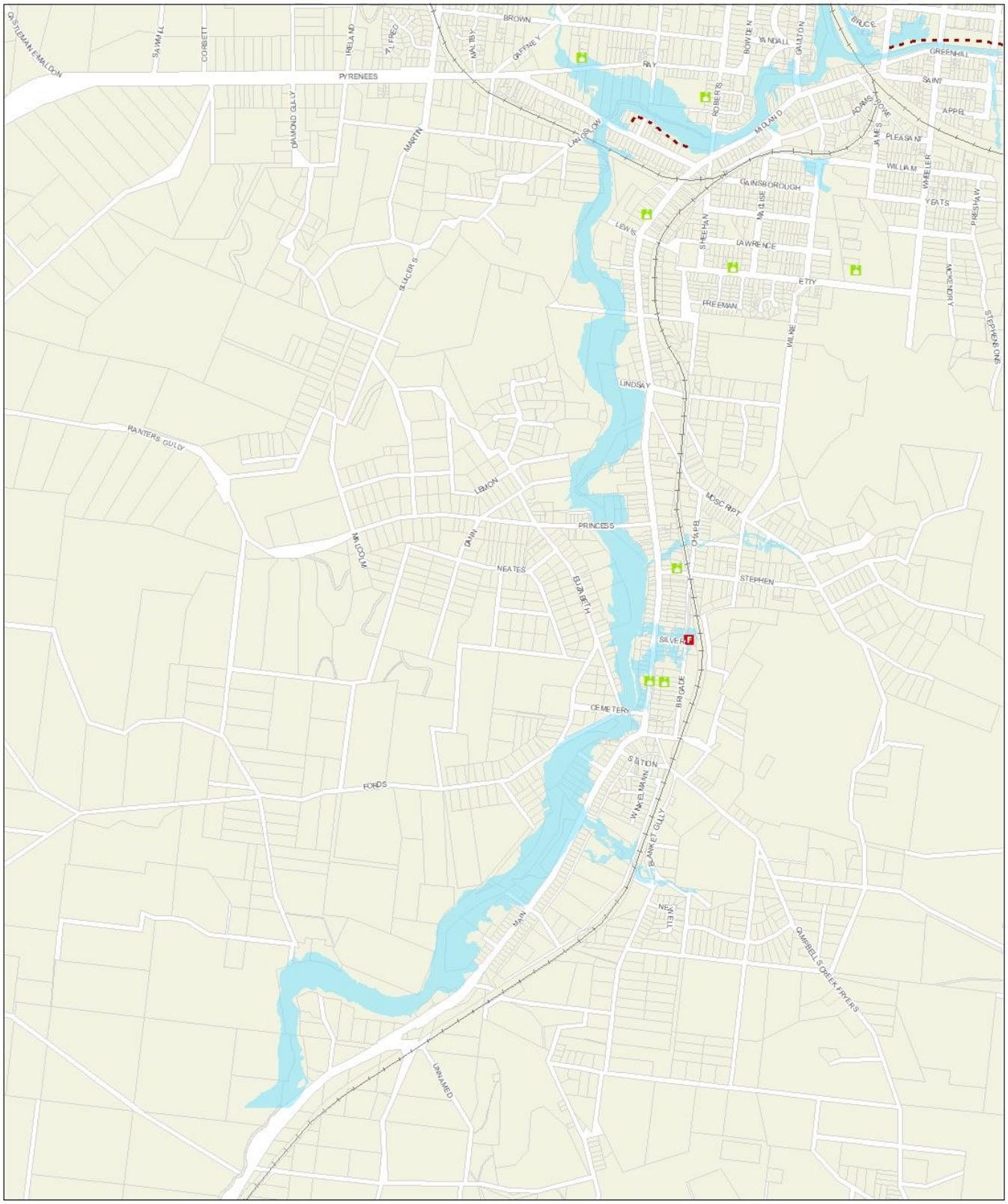
CASTLEMAINE - 10% AEP Flood Extent
Campbells Creek



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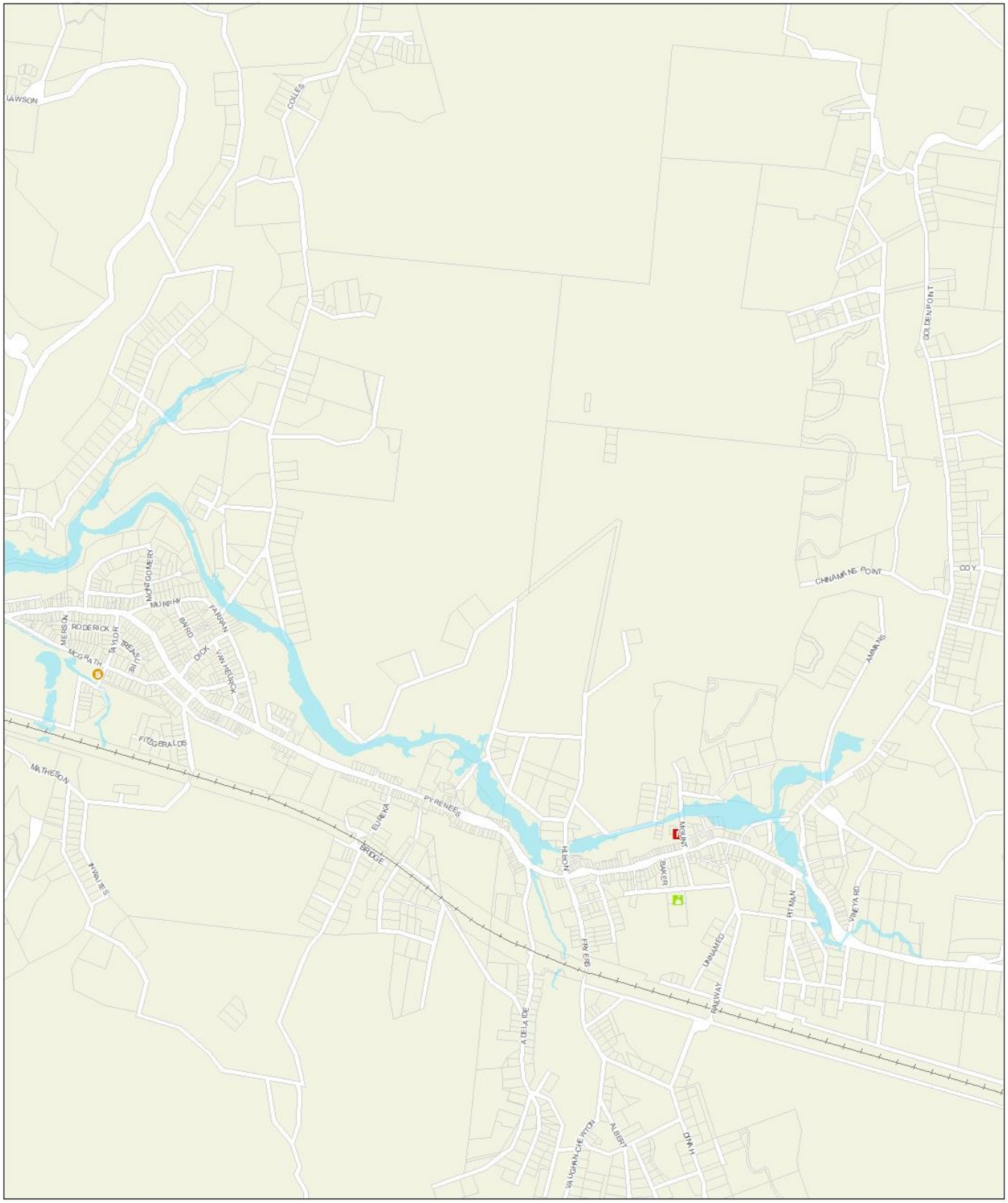
CASTLEMAINE - 10% AEP Flood Extent
Forest Creek



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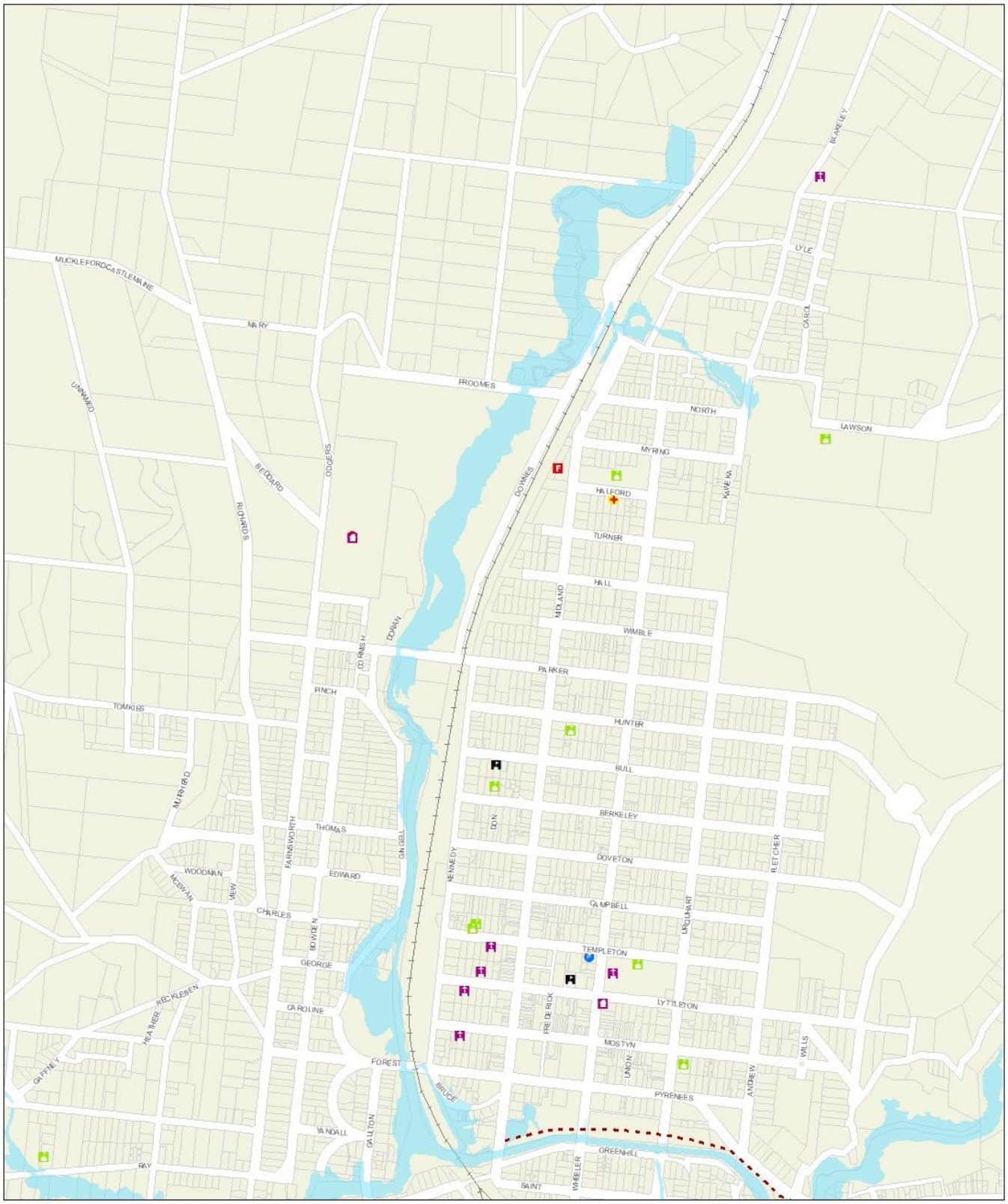
MOUNT ALEXANDER SHIRE

CASTLEMAINE - 20% AEP Flood Extent
Barkers Creek



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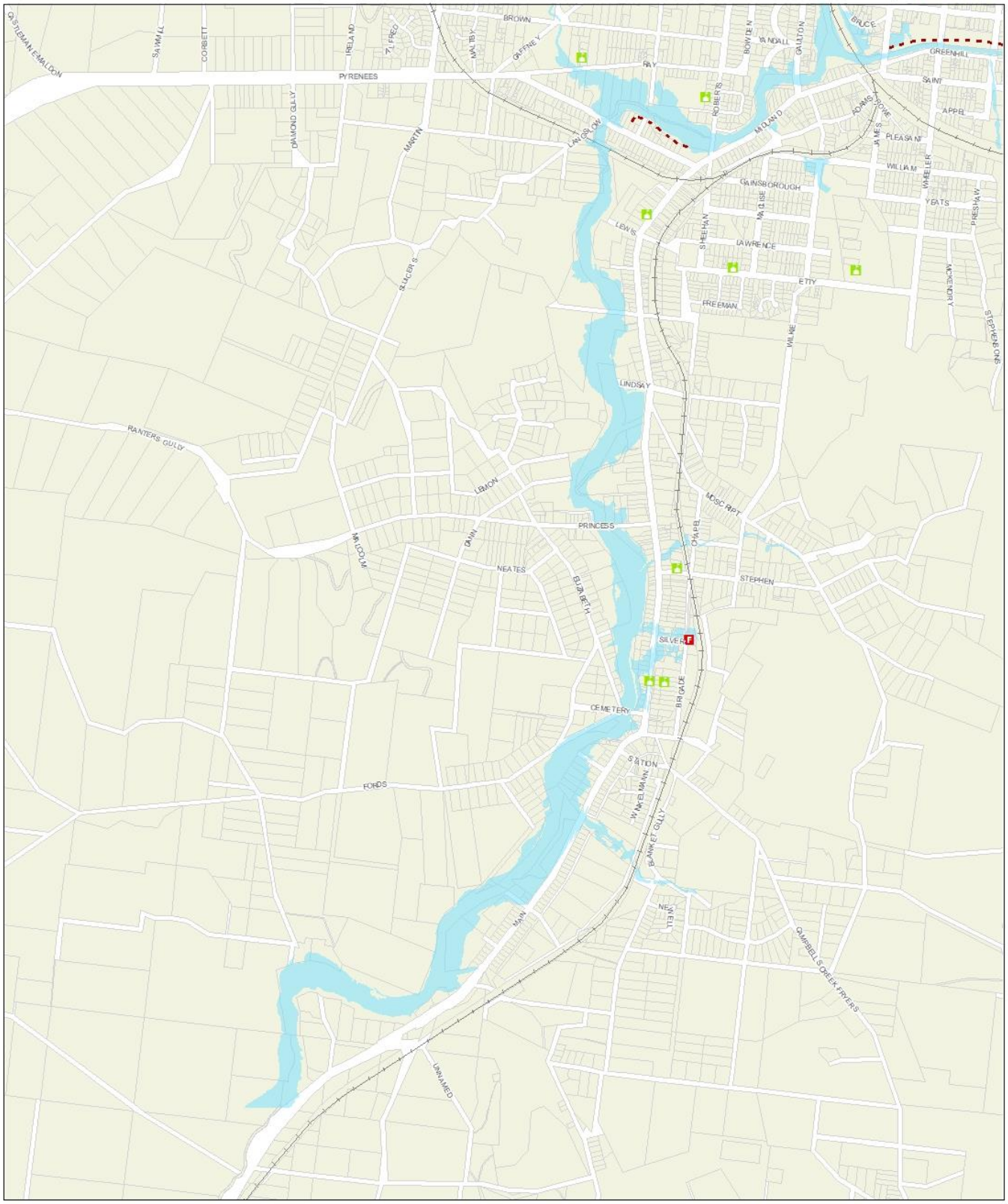
MOUNT ALEXANDER SHIRE

CASTLEMAINE - 20% AEP Flood Extent
Campbells Creek



N

Scale at A4

0 0.175 0.35 Kilometers

1:15,000

- Ambulance Station
- Depot/Municipal Office
- Church
- Camp Ground
- Retirement/Aged Care
- Hospital
- Fire Station
- Police Station
- School/Child Care
- SES Unit
- Road
- Rail Trail
- River/Creek
- Creek/Stream
- Levee
- Extent of Flood Data
- Township boundaries
- Cadastre
- 20% AEP Flood

SES

MOUNT ALEXANDER SHIRE COUNCIL

NORTH CENTRAL Catchment Management Authority

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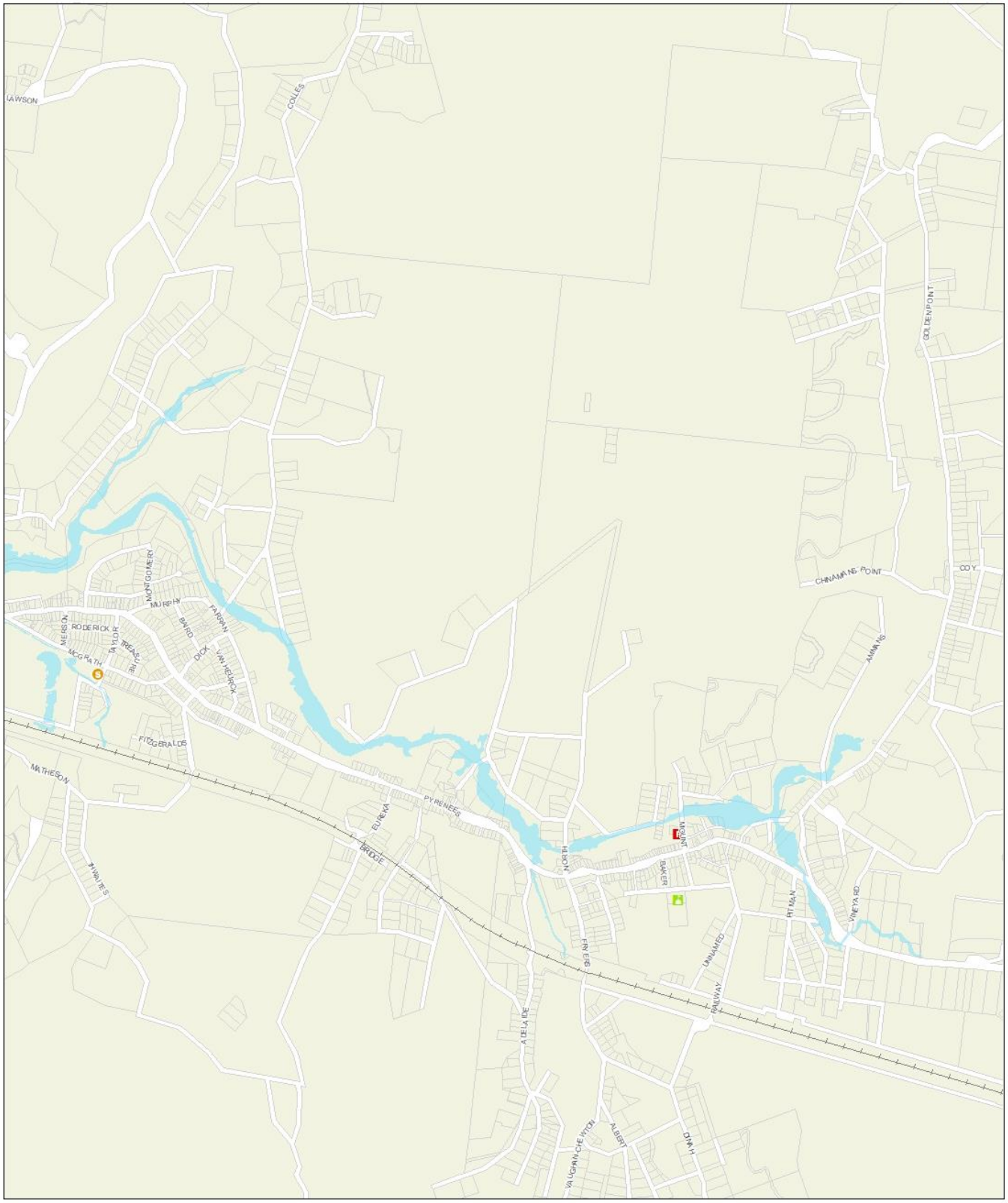
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CASTLEMAINE - 20% AEP Flood Extent
Forest Creek



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Scale at A4

0 0.175 0.35 Kilometers

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- Ambulance Station
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- Camp Ground
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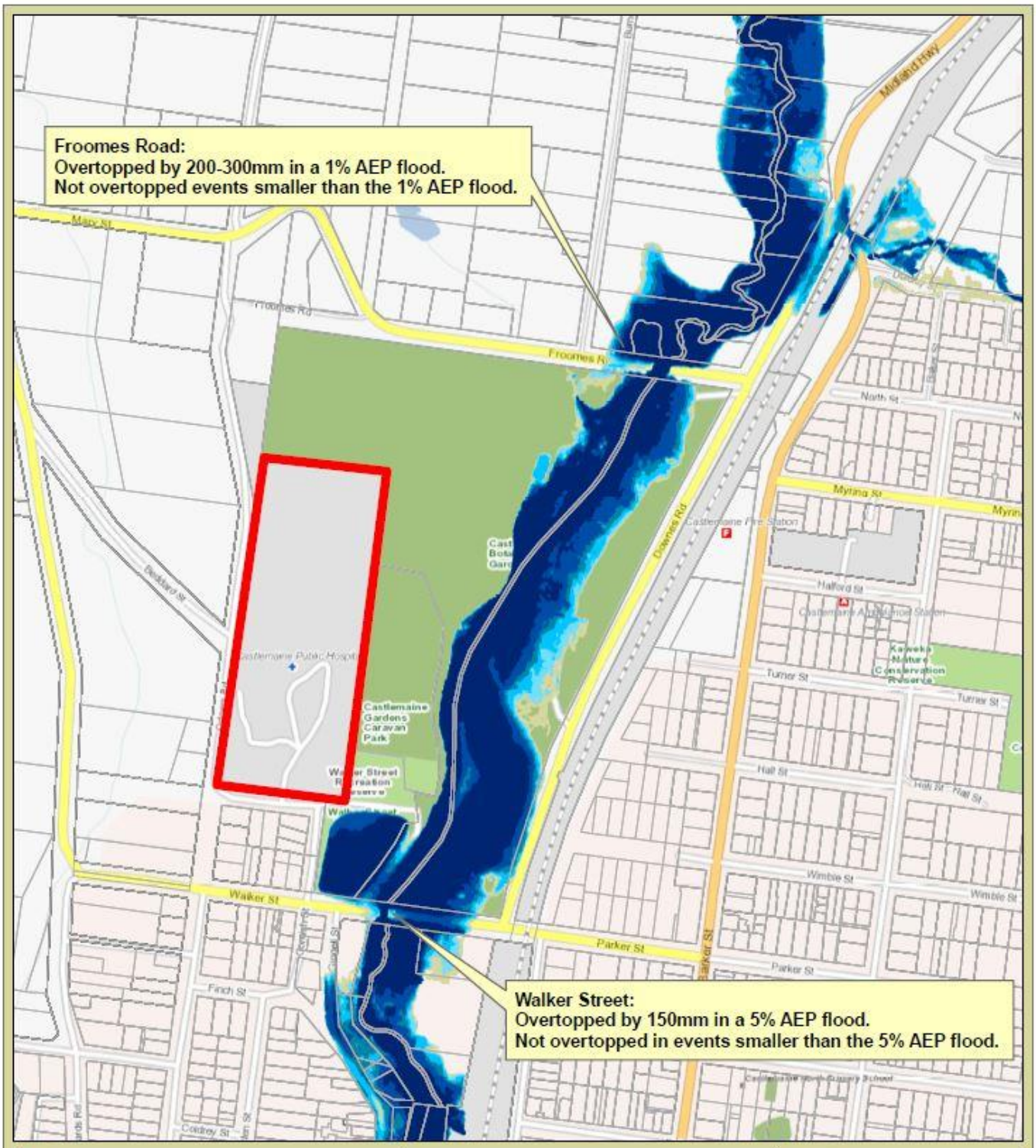
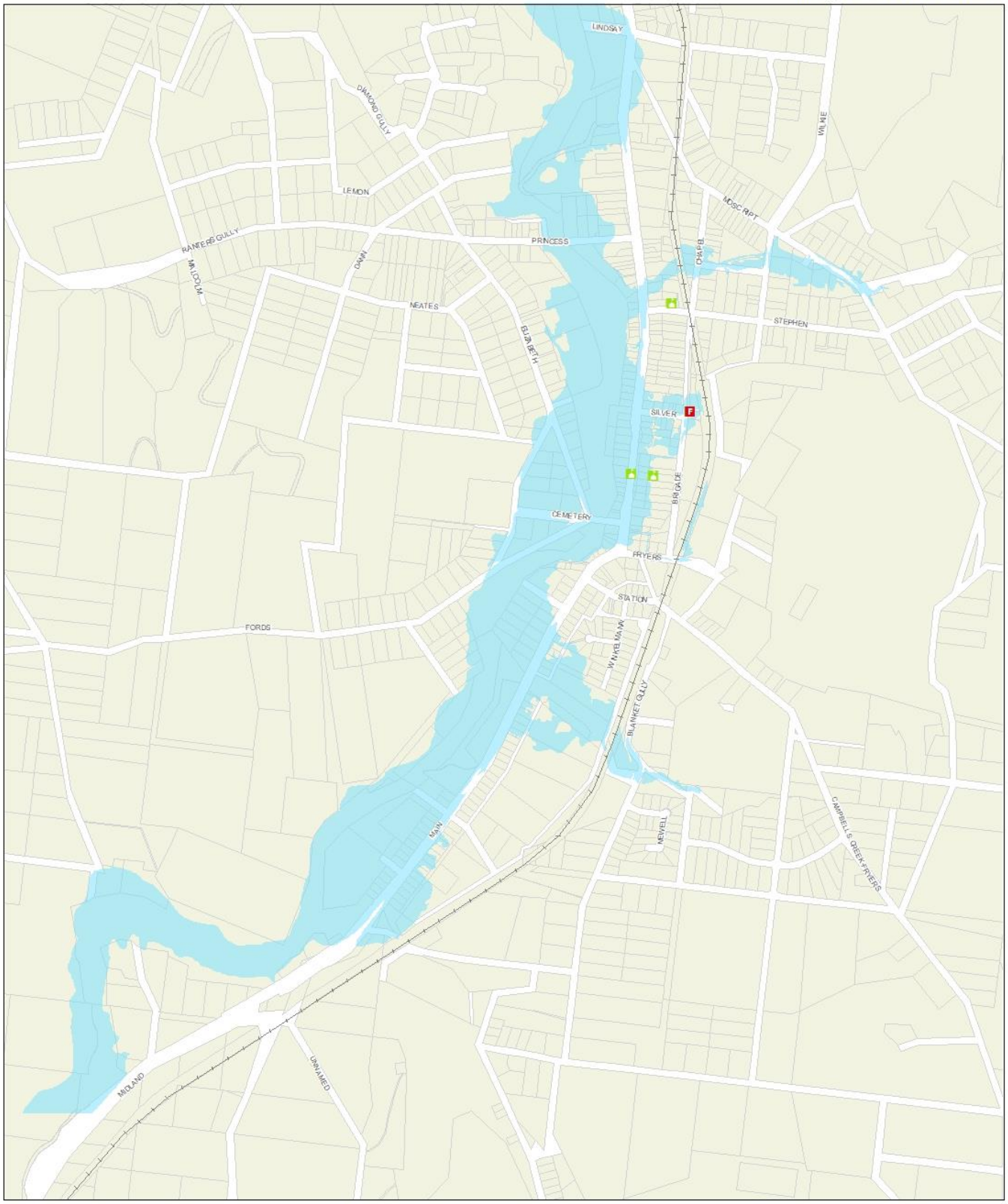

Froomes Road:
Overtopped by 200-300mm in a 1% AEP flood.
Not overtopped events smaller than the 1% AEP flood.
Walker Street:
Overtopped by 150mm in a 5% AEP flood.
Not overtopped in events smaller than the 5% AEP flood.
Midland Hwy
Main St
Froomes Rd
North St
Myrtna St
Downes Rd
Castlemaine Fire Station
Halford St
Castlemaine Ambulance Station
Kalweka Nature Conservation Reserve
Turner St
Hall St
Wimble St
Walker St
Parker St
Finch St
Castlemaine Gardens Caravan Park
Castlemaine Public Hospital
Walker Street Recreation Reserve
Coldrey St
PROJECT:
Extent of Flood Inundation
1% AEP Peak Flood Event
TITLE:
Castlemaine Health - Access
MAP #:
N
W
E
S
1:7,000
0 50 100 200
Meters
LEGEND
Flooding
< 0.1
0.1 - 0.35
0.35 - 0.5
0.5 - 0.8
>0.8
The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
VICTORIA
NORTH CENTRAL
Date: 7/06/2019
Q:\lpawsData2.2\GIS\FLOODPLAIN_GIS_PROJECT.mxd

MOUNT ALEXANDER SHIRE

CAMPBELLS CREEK
0.5% AEP Flood Extent



N

Scale at A4

0 0.125 0.25 Kilometers

1:10,000

- Ambulance Station
- Depot/Municipal Office
- Church
- Camp Ground
- Retirement/Aged Care
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- Fire Station
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- School/Child Care
- SES Unit
- Road
- Rail Trail
- River/Creek
- Creek/Stream
- Levee
- Extent of Flood Data
- Township boundaries
- Cadastre
- 0.5% AEP Flood

SES

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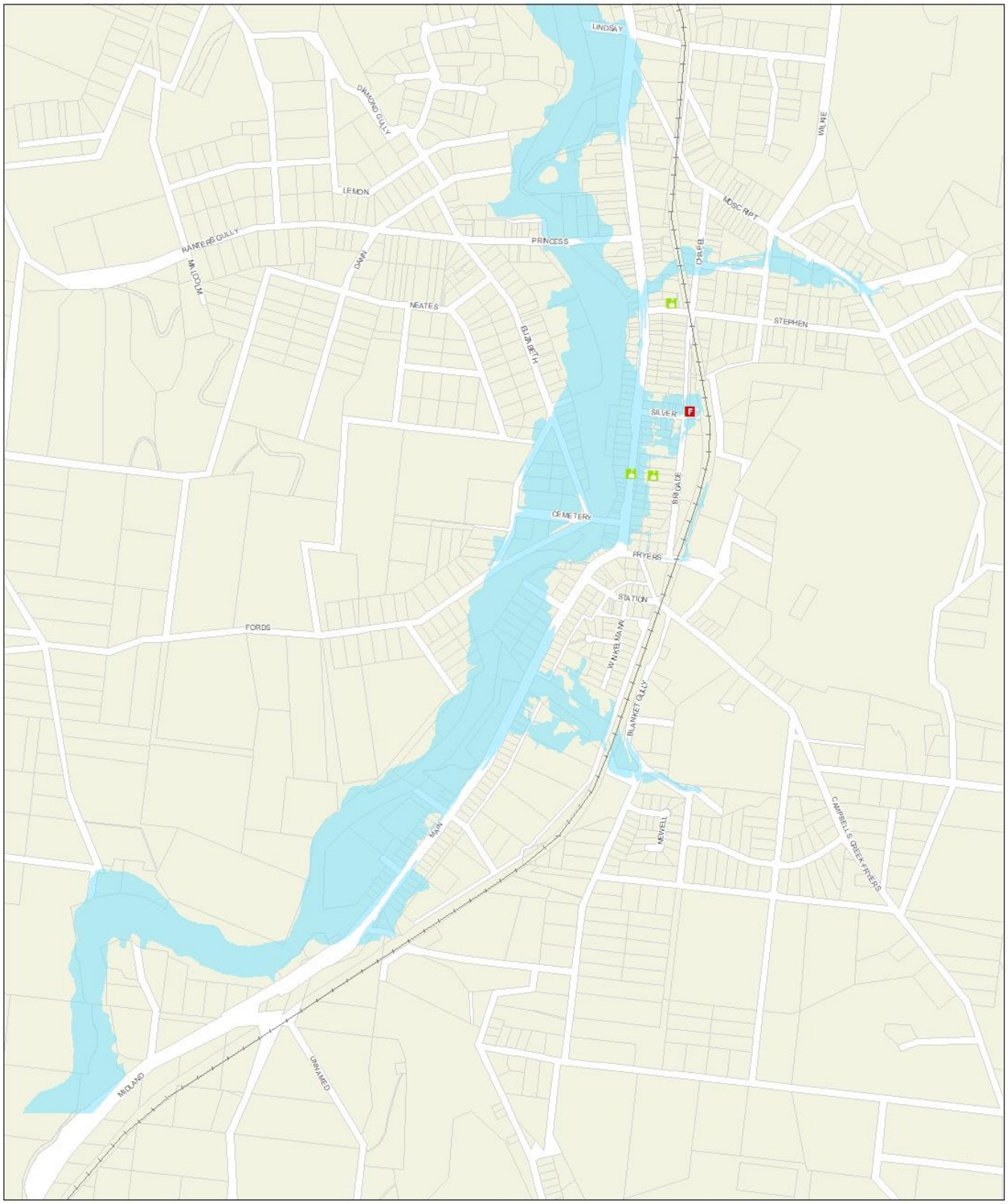
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CAMPBELLS CREEK
1% AEP Flood Extent



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Scale at A4

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- 1% AEP Flood

SES

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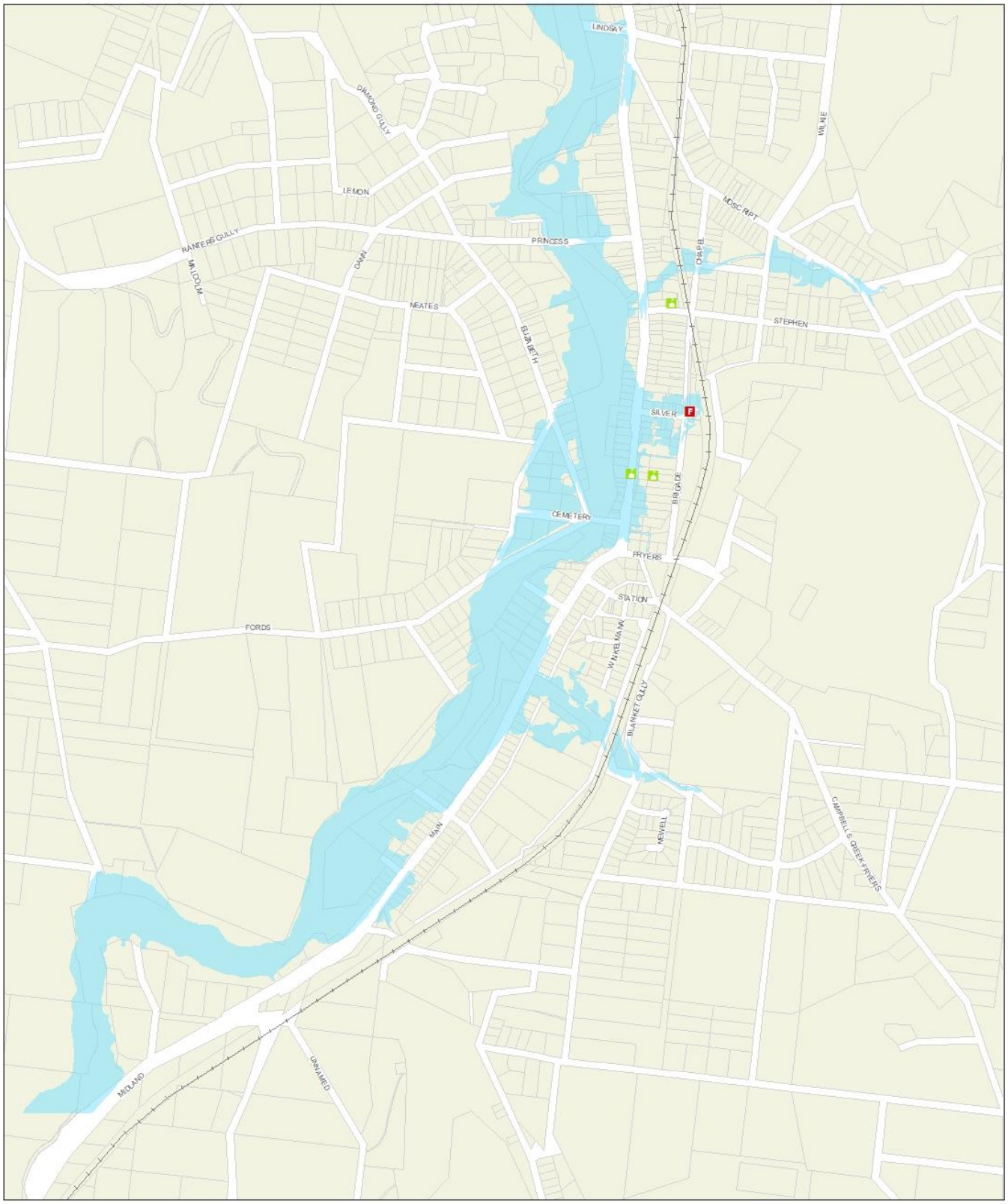
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CAMPBELLS CREEK
2% AEP Flood Extent



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Scale at A4

0 0.125 0.25 Kilometers

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- 2% AEP Flood

SES

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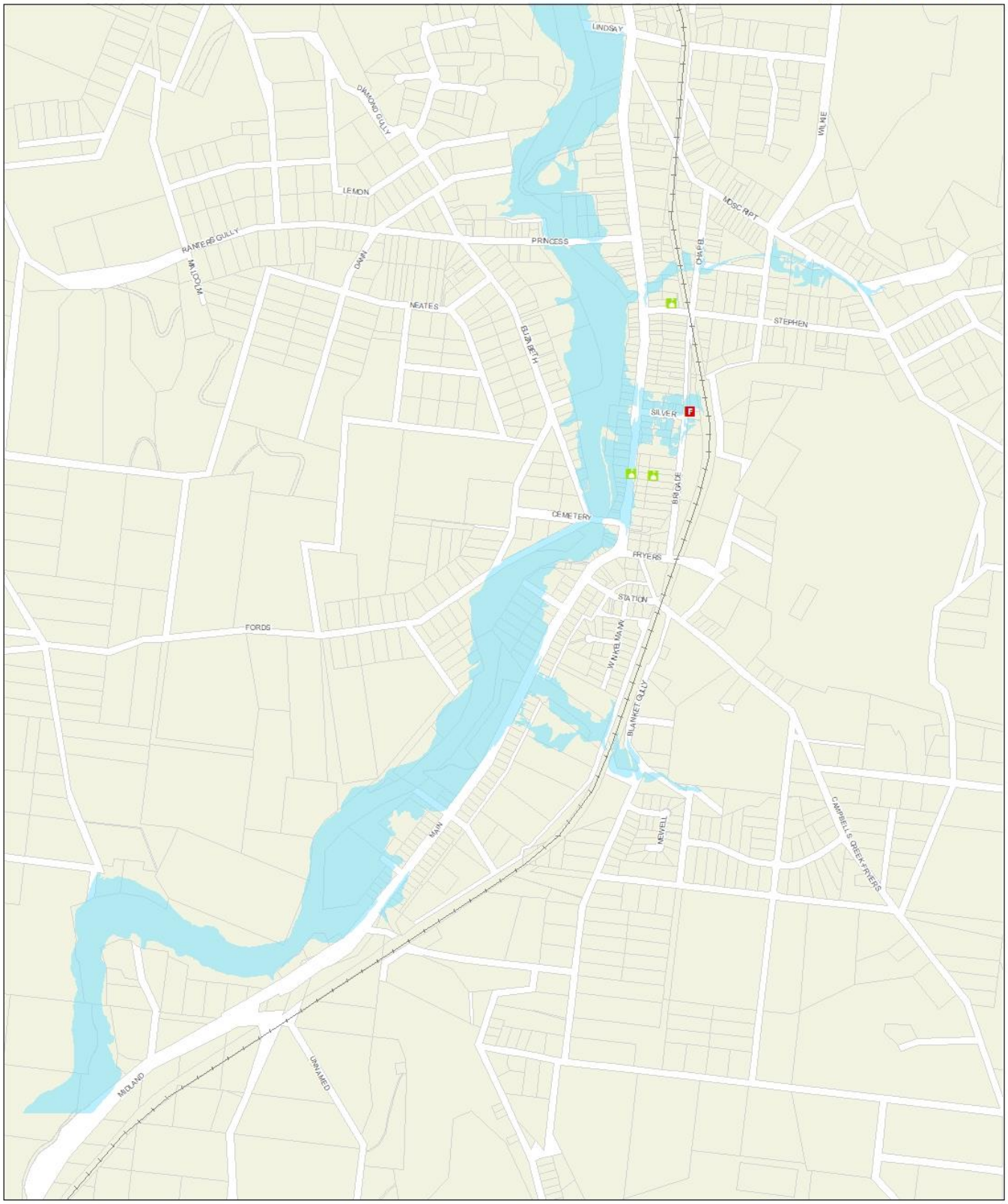
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CAMPBELLS CREEK
5% AEP Flood Extent



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Scale at A4

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- 5% AEP Flood

SES

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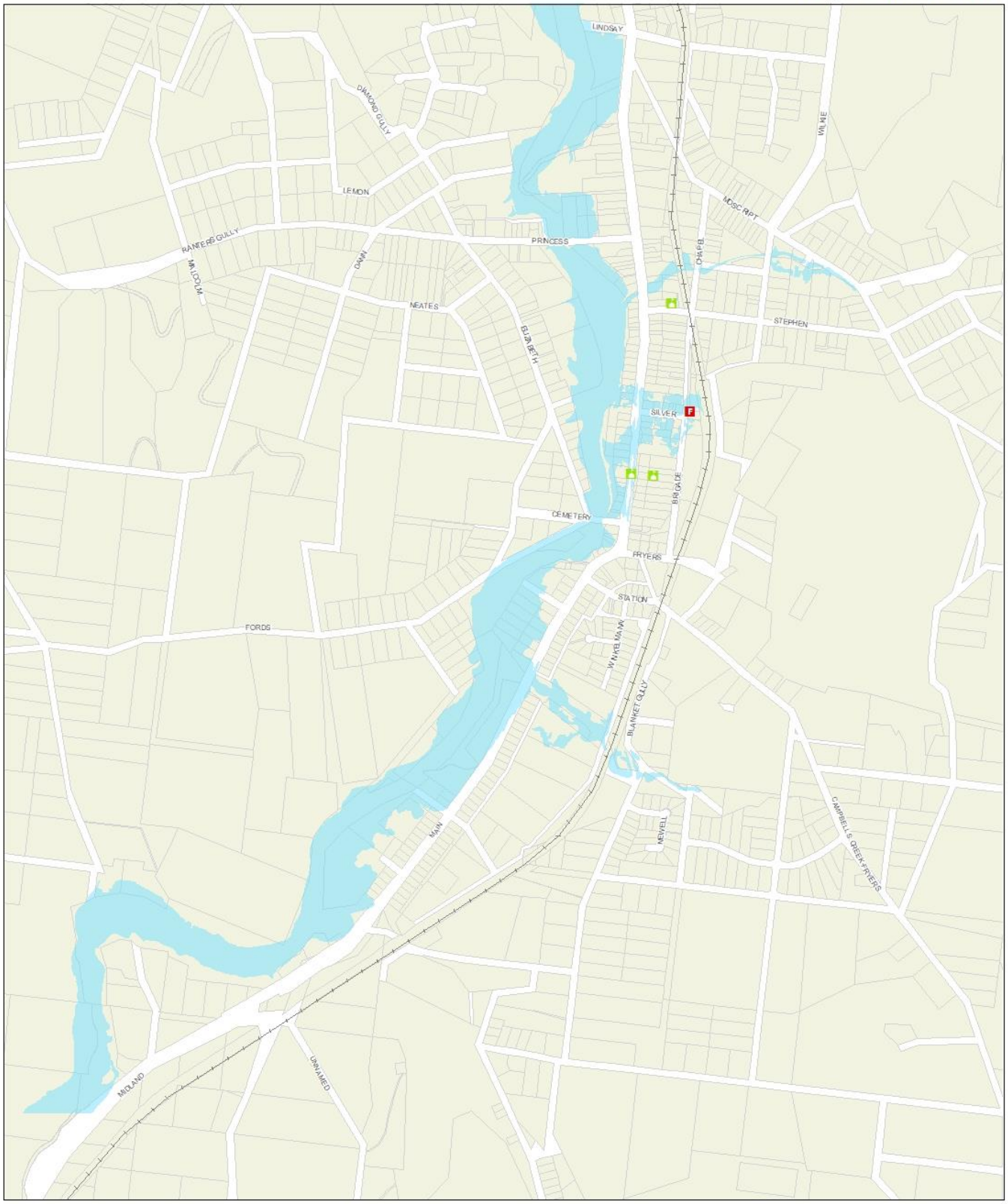
MOUNT ALEXANDER SHIRE

CAMPBELLS CREEK
10% AEP Flood Extent



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Scale at A4

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- Cadastre
- 10% AEP Flood

SES

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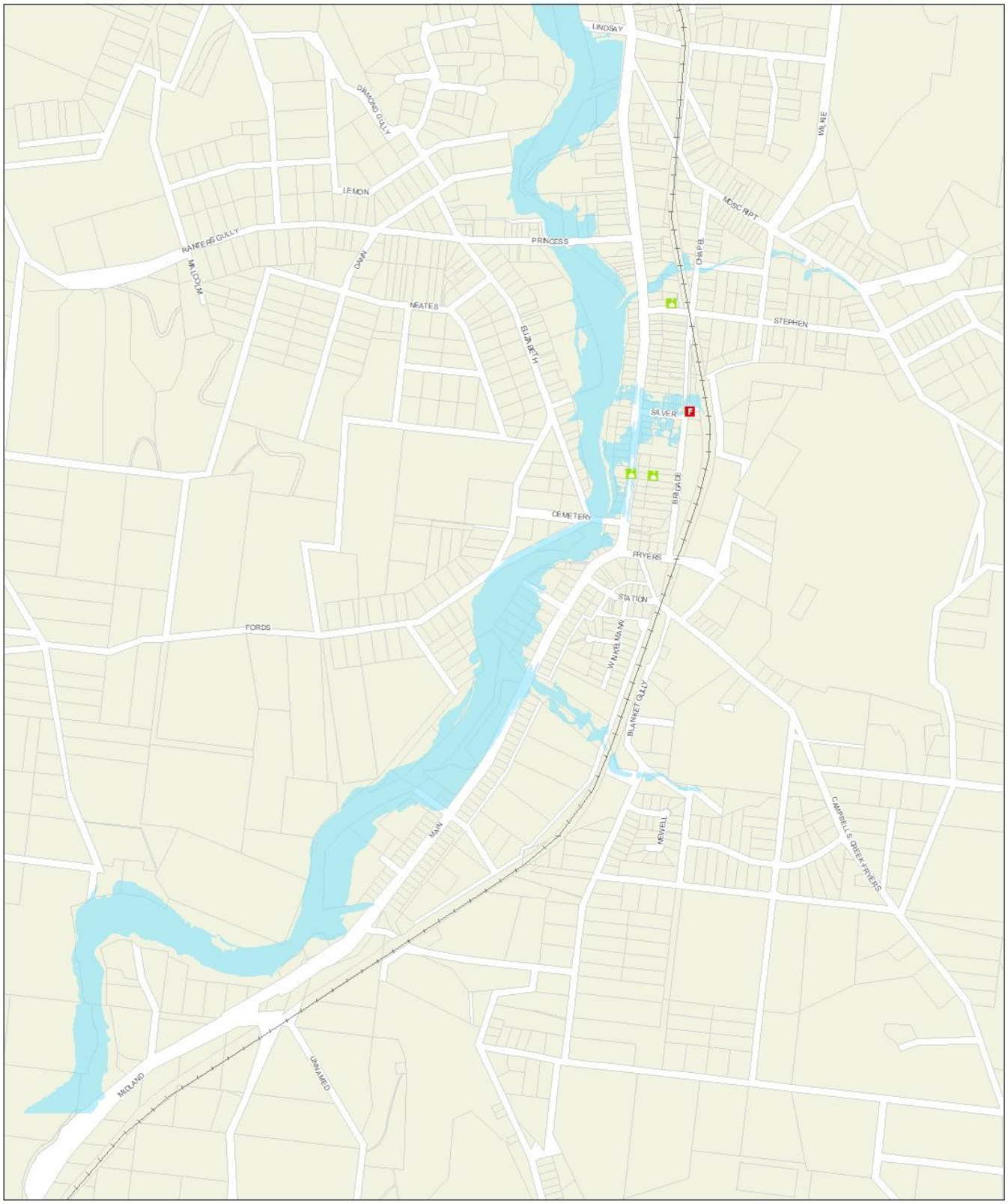
Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE

CAMPBELLS CREEK
20% AEP Flood Extent



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Scale at A4

0 0.125 0.25 Kilometers

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- Ambulance Station
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- 5% AEP Flood

SES

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Map Produced: 23 October 2018

MOUNT ALEXANDER SHIRE **NEWSTEAD**

N

Scale at A4

0 0.125 0.25 Kilometers

1:10,000

- Ambulance Station
- Depot/Municipal Office
- Church
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- Creek/Stream
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- Extent of Flood Data
- Township boundaries
- Cadastre
- 1% AEP Flood

SES

NORTH CENTRAL Catchment Management Authority
Connecting Rivers, Landscapes, People

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Map Produced: 23 June 2015

MOUNT ALEXANDER SHIRE **BARINGHUP**

N

Scale at A4

0 0.125 0.25 Kilometers

1:10,000

- Ambulance Station
- Depot/Municipal Office
- Church
- Camp Ground
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- Fire Station
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SES

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Connecting Rivers, Landscapes, People

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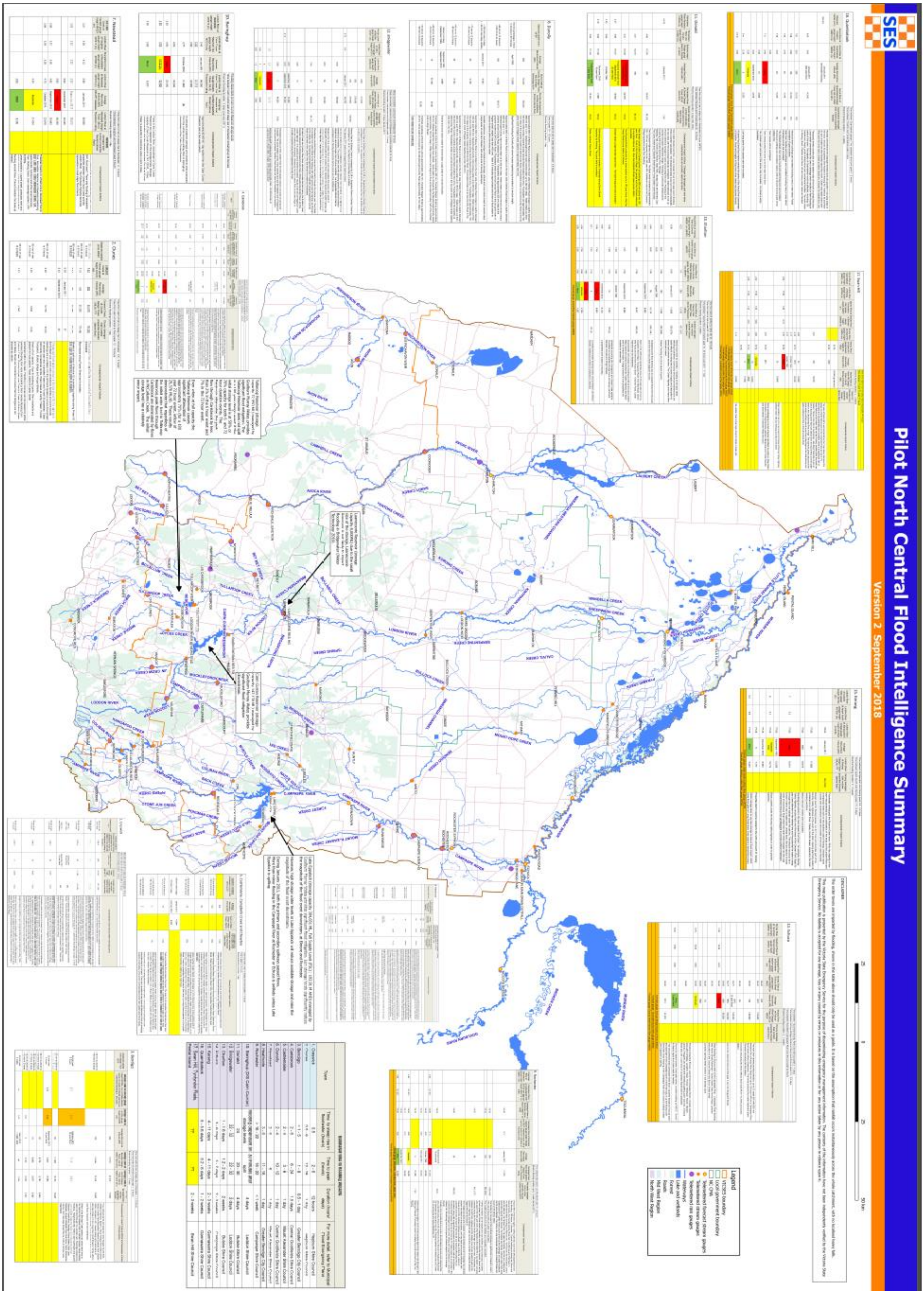
Map Produced: 23 June 2015



SES
Pilot North Central Flood Intelligence Summary
Version 2 September 2018

Appendix G: Local knowledge arrangements

As control agency for flood in Victoria, VICSES is committed to ensuring the incorporation of local knowledge in decision making before, during and after incidents.

Information from community sources including but not limited to observations, historical information and information about current and possible consequences of an incident may be utilised to help inform the process of incorporating local knowledge into decision making during an incident. Community observers, Local Information Officers (LIOs) and other agency networks identified in this plan will help support this process.

LIOs provide a key communication interface to community observers and other sources of local knowledge.

For the Mount Alexander Shire Council, community observers identified are:

Community Observer Name	Community Observer contact details	LIO Contact	Key areas of local knowledge expertise
Trent Gibson	0428 595 898		Harcourt, Castlemaine
Geoff Park	0418 138 632		Newstead
Dick Green	0458 382 082		Campbells Creek

For the Castlemaine VICSES Unit, the Local Information Officer identified is:

LIO Name	LIO contact details	Community Observer contacts
Paul Fitzpatrick – or delegate	0411 989 750	Unit Controller

For the Mount Alexander Shire Council other agency networks identified are:

- CFA, Vicpol, AV, Municipality Representatives, Water Authorities, Local community leaders.

Important Notes:

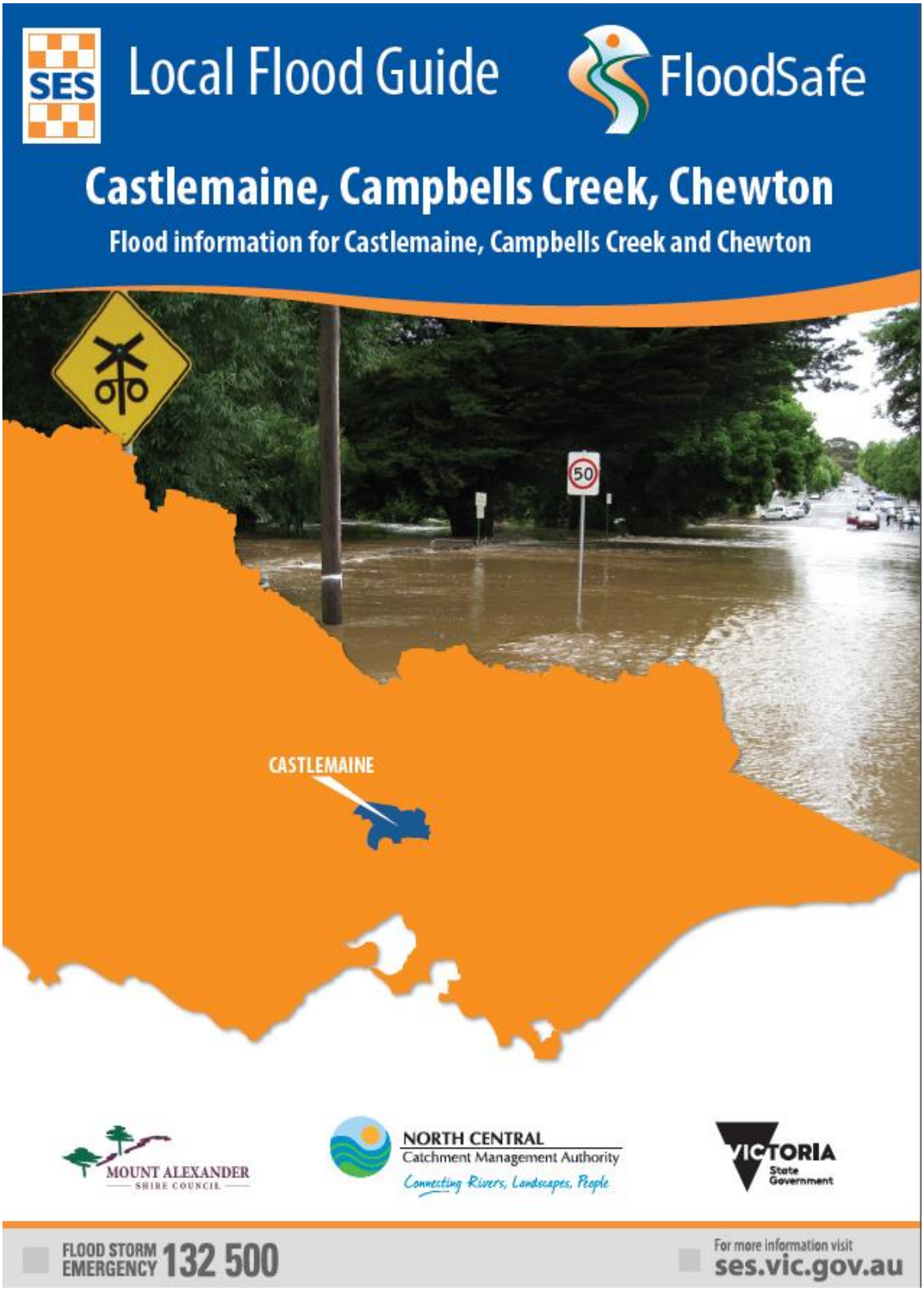
These arrangements do not permit community observers and existing agency networks any responsibility for operational decisions and do not permit community observers and existing agency networks to direct operational activity, including the management of flood levees.

Information provided from sources of local knowledge must be processed and validated before it can become intelligence to inform decision making.

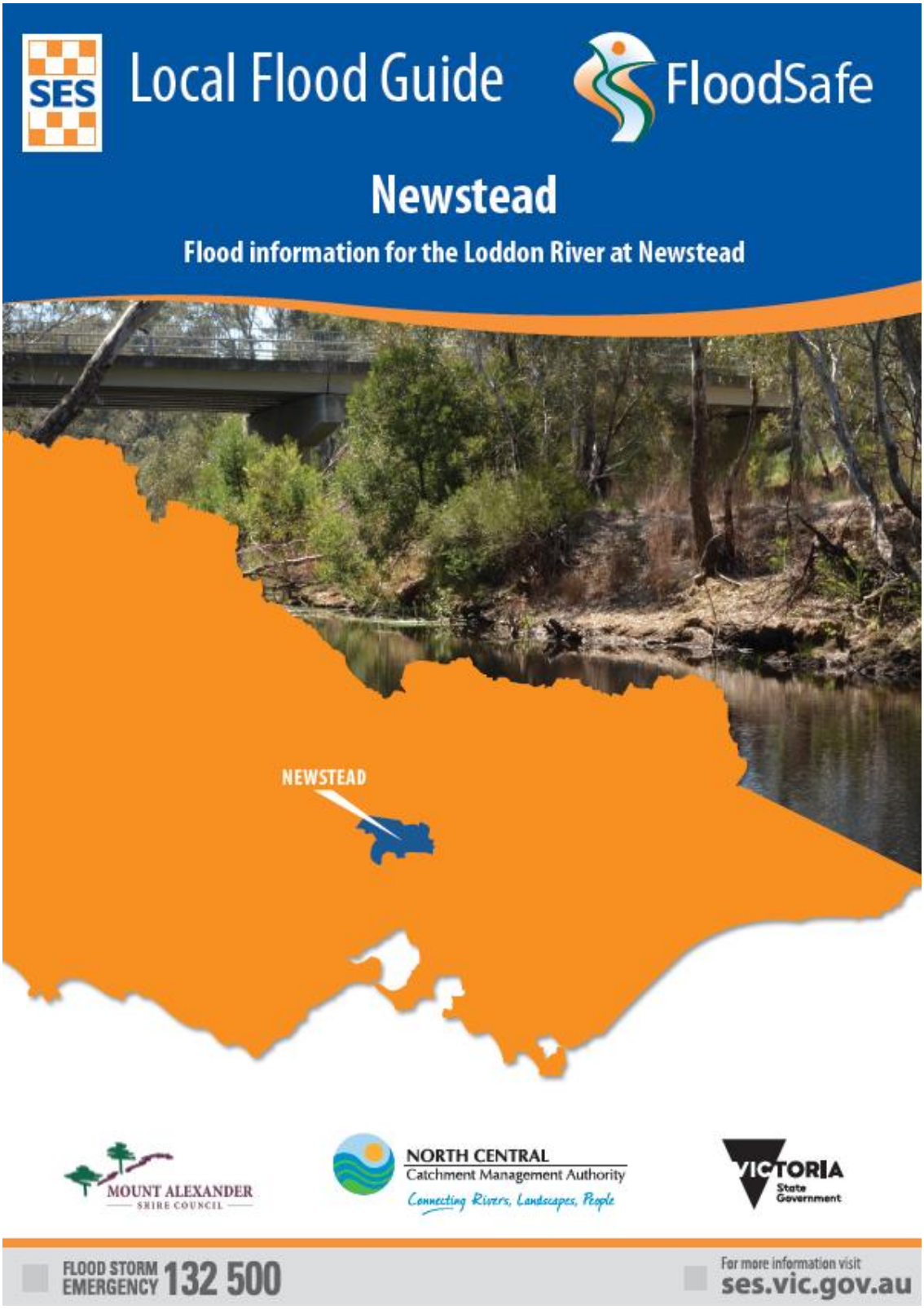
This information will continue to be developed with additional detail

Appendix H: Local flood information

- Refer to the link below for the Castlemaine, Campbells Creek, Chewton Local Flood Guide
  https://www.ses.vic.gov.au/documents/112015/2504320/Castlemaine%2C+Castle+Creek+and+Chewton+Local+Flood+Guide.pdf/59f91acb-530d-17b1-89c1-af8b91f74839



- Refer to the link below for the Newstead Local Flood Guide
  https://www.ses.vic.gov.au/documents/112015/2504320/Newstead+Local+Flood+Guide.pdf/1ecdb69e-c26e-838d-23ff-80842e7a6b1b



APPENDIX I – SANDBAGS

This applies to the procurement, storage, distribution, use and disposal of sandbags during flood emergencies, primarily Riverine flood events. Flash Flood events, due to their quick nature, will be directed by the local VICSES Unit.

1. Use of sandbags

Sandbags can be used to block doorways, drains and other openings into properties as well as to weigh-down manhole covers, garden furniture and to block sinks, toilets and bath drains to prevent water backing up. They have proven to be successful in keeping water out for short periods of time.

Sandbagging is not always the most effective option and should be considered in the context of this Flood Emergency Plan which includes alternatives for managing flood risk. Other alternatives include moving possessions to higher places, securing objects so they do not float away and placing valuables in water tight containers. During a flood event he Incident Controller and operational staff in the flood affected community will assess the overall risk to communities and allocate sandbag resources based on risk.

2. Responsibilities

VICSES responsibilities include:

- The management of the state-wide procurement and storage of sandbags for flood emergencies
- Providing sandbags to local areas for distribution based on requirements identified in the MFEP
- Identifying distribution arrangements in the MFEP
- Community education and awareness on sandbag management and safe use
- Identifying Critical Infrastructure and Community Critical Facilities in the MFEP
- Providing a support role in flood recovery.

Council responsibilities include:

- Supporting VICSES in developing the MFEP
- Providing a support role during flood response
- Identifying Community Critical Facilities at a municipal level
- Procuring sandbags to protect council owned facilities including Community Critical Facilities managed by council
- Providing locations, plant and equipment, where available and capable, to support sandbagging operations as agreed in the MFEP
- Coordinating the clean-up and community recovery arrangements

Community Critical Facility owners' responsibilities include:

- Working with VICSES to develop an effective flood mitigation plan for their property as part of the MFEP with a priority for permanent structures.

Other 'Response' agencies responsibilities include:

- Supporting VICSES in their response role.

Residential and commercial property owners' responsibilities include:

- Understanding their own flood risk
- Preparing an emergency plan for their home or business
- Procurement and storage of sandbags to protect their own property
- Filling and movement of sandbags to protect their property
- Seek advice from their local council regarding the removal of sandbags from their property, as part of the community recovery

3. Community and business education

VICSES has an established community education program to support community and business in responding to flood emergencies (see www.ses.vic.gov.au/prepare/floodsafe).

VICSES will use the existing community education tools and programs (such as the Local Flood Guides and the FloodSafe program) to promote:

Practical information on:

- The purpose, use and disposal of sandbags (see
- Obtaining sandbags
- Safety considerations e.g. OHS, manual handling, safe use and disposal
- Alternative flood mitigation strategies to sandbagging
- Where to get information – Phone 1300 842 737 for the VICSES Information Line
- The responsibilities of critical infrastructure owners, businesses and private individuals to understand their flood risk and develop a flood plan

Key messages:

- Emergency response agencies will not always have the capacity to provide sandbags due to other competing priorities
- Businesses and individuals need to understand the flood risk to their property and, where appropriate, develop a Flood Emergency Plan

Sandbagging is only one way of protecting properties against floodwater and not always the most effective option. Sandbagging should be considered in the context of a Flood Emergency Plan which considers alternatives for managing flood risk.

4. Procurement of sandbags

VICSES
VICSES will maintain a supply of sandbags to support the effective readiness and response to flood emergencies as identified in this MFEP.

The number of sandbags required at a State and regional level will be determined from information provided through the MFEP planning process. There may be occasions where the supply of sandbags is limited and priorities for distribution will need to be determined through local emergency management arrangements.

VICSES will maintain the current cross-border and mutual aid arrangements for flood emergencies. VICSES will also work with local councils to access the resource sharing arrangements established between councils during emergencies.

Council
Council will procure sandbags to protect council owned facilities including Community Critical Facilities managed by council

Residential and commercial property owners'
Sandbags and sand may be obtained (purchased) from local landscape and garden suppliers.

5. Storage of sandbags

VICSES
Sandbags will be stored by VICSES in appropriate locations across the municipality. VICSES will monitor the condition of all its sandbags for deterioration.

VICSES sandbags storage locations and initial quantities are as follows:

Castlemaine VICSES Local Headquarters (LHQ)	2000 bags (minimum)
Newstead CFA Brigade Headquarters	1000 bags (minimum)

Additional sandbag supplies are held at the North West (Loddon Mallee) VICSES Regional Offices, located in Bendigo & Swan Hill. These can be accessed for replenishment or additional requirements. Additional sandbags will be supplied to these locations in the lead up to a flood event.

Council
Sandbags will be stored at appropriate Council locations across the municipality. Council will monitor the condition of all its sandbags for deterioration.

Council sandbags storage locations and quantities are as follows:

Works Depot, (quantity to be confirmed)

6. Distribution of sandbags

Priorities
The Incident Controller may make sandbags and sand available for flood mitigation activities during declared flood emergencies.

Sandbags will be issued consistent with the Strategic Control Priorities within the State Flood Emergency Plan, in the following order of priority to protect:

1. Critical Infrastructure and Community Critical facilities identified:
   (a) in the MFEP or
   (b) by the Incident Management Team

2. Residential properties identified in the potential flood area

3. Commercial properties identified in the potential flood area

4. Environmental and conservation areas identified in the potential flood area.

Properties identified as being outside the potential flood area, will be referred to an alternative source of sandbags (e.g. local hardware store or sandbag supplier) by VICSES.

Distribution Points
In preparation for a significant flood emergency, VICSES will work with local councils and other agencies to identify appropriate locations for sandbag collection points. Location considerations will include access, safety, human resources and machinery requirements.

Suggested sandbag collection points:
*additional/alternate points can be nominated by the Incident Controller

Castlemaine
Camp Reserve, Gingell St.
Farmers Market Site, Hargraves St.

Newstead
Recreation Reserve, Recreation Ave

The Floodsafe Sandbag Quick Reference Guide (see https://www.ses.vic.gov.au/documents/112015/136923/sandbag%20guide.pdf/8fb25a6f-dab1-2ef9-944b-9f5007c66b39) provides details to community members about the indicative number of sandbags required for residential property protection and guidance on the safe use, for the filling and laying of sandbags.

As part of the response arrangements, the Incident Controller will track the distribution of sandbags through the Incident Management Team (IMT). This information will be provided to the recovery team as part of the transition from response to recovery.

Provision of sand

VICSES

VICSES will have plans in place to acquire sand through its own supply arrangements and where necessary through the emergency management arrangements. These arrangements will be identified in the MFEP. Sand suppliers may be identified in the MFEP.

Council

Council will have plans in place to acquire sand through its own supply arrangements

During a localised non declared flood event, sand will be procured by the local responding VICSES Unit. During a declared flood event, sand will be procured via the Incident Control Centre

7. Disposal and relocation of used sandbags

Sandbags may be contaminated after use and local councils should ensure that clean up and disposal is considered as part of recovery. Removal and disposal of sandbags used for flood mitigation shall be dealt with under the clean up and community recovery arrangements as outlined in the Emergency Management Manual Victoria. The disposal of sandbags is a shared responsibility between different agencies.

Incident Controllers will provide information on sandbag locations to councils, to assist with clean-up. VICSES will continue to work with relevant agencies to develop protocols for the safe and environmentally responsible disposal of sandbags.