

Date: 16 September 2022



**MOYNE PLANNING SCHEME AMENDMENT**  
**C69moyn**  
**PORT FAIRY COASTAL AND**  
**STRUCTURE PLAN**

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SUBMISSION - 

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## Introduction

1. This submission is made on behalf of [REDACTED] (Submitter No. 63) (**Client**), the landowners of 196 Griffiths Street, Port Fairy (**Subject Site**), in relation to Amendment C69moyn (**Amendment**) to the Moyne Planning Scheme (**Scheme**).
2. This Subject Site is vacant and has an area of around 1,000 square metres. The Subject Site has around 20 metres frontage to Griffiths Street.
3. Amendment C69moyn, as exhibited, proposes to apply the following controls to the Subject Site:
  - Neighbourhood Residential Zone (currently General Residential Zone),
  - Design and Development Overlay (Schedule 6) (currently DDO21), and
  - Flood Overlay (currently Flood Overlay and Land Subject to Inundation Overlay).
4. The Amendment also proposes to introduce the Port Fairy Local Floodplain Development Plan as an incorporated document within the Scheme.
5. Our Client's primary submission is the Port Fairy Local Floodplain Development Plan should provide clear guidance on accessway requirements and should provide flexibility for landowners to provide innovative responses that effectively adapt to flood issues within the existing township areas, as envisaged by the Paris Climate Accord<sup>1</sup> which equally considered both mitigation and adaptation as appropriate approaches in responding to the future demands of client change.

## Our client

6. Our Client has owned the Subject Site since [REDACTED]. They purchased the land to build a home that is intended to be a family home and their principal place of residence upon retirement (see **Attachment 1** for map of the Subject Site).
7. Our Client does not object to the proposed rezoning of the land to the Neighbourhood Residential Zone nor the application of the new schedule to the Design and Development Overlay (DDO6).

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<sup>1</sup> [Key aspects of the Paris Agreement](#)

8. With regards to the proposed flood controls, our Client supports the need to plan for increased risks associated with a changing climate, including increased flood risks associated with increasing sea levels.

9. [REDACTED]  
[REDACTED] which informed the preparation of the Moyne 2040 Community Vision<sup>2</sup>, which includes the following vision for environment:

Our natural environment is our biggest asset. We are lifelong learners working together to care for the coast and country. We embrace sustainable practices and development, and proactively address climate change.<sup>3</sup> *Emphasis added*

10. It is also noted that the Moyne Futures Community Panel identified and highlighted the urgent need for more affordable housing as a future community priority. Thus responding to climate change through an adaptive approach, provides a framework whereby both future community concerns can be most effectively addressed to ensure Moyne Shire continues to grow more prosperous, connected, inclusive and resilient.

## Background

11. The Subject Site is one of around 290 residential sites in the vicinity of the Griffiths Street East Beach precinct. Of these sites, there are around nine (9) vacant sites, including the Subject Site (see **Attachment 2**).

12. There are several properties within this precinct which are impacted by flooding (including the Subject Site).

13. In early 2020, our Client embarked on a design process for a new dwelling on the Subject Site. A single storey detached dwelling is proposed which responds to the existing DDO21 (and proposed DDO6) provisions. [REDACTED]

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<sup>2</sup> [Moyne 2040 Community Vision](#)

<sup>3</sup> Ibid, page 14

<sup>4</sup> [REDACTED], Moyne Shire Council issued a Notice to Decision to Grant a Permit. The decision is subject to review by the Tribunal (Glenelg Hopkins Catchment Management Authority vs Moyne Shire Council)

14. A key driver for the design brief was to design a quality, yet affordable, family home which embraced sustainable practices and proactively adapts to future demands imposed by climate change tailored to risks at the local level (as sought by the Moyne 2040 Community Vision) in accordance with the adaptation approach envisaged by the Paris Climate Accord. The design incorporated pier footings and open sided garaging which allows flood waters to move through the site, while providing a floor level above the nominal flood protection level.
15. While the design of the proposed dwelling can respond to flood risks (including an allowance for sea level rise), it is noted that Griffiths Street is subject to flooding of depths greater than 300mm, with two notable low points - one low point near the Gardens Caravan Park and another low point to the north, near the Port Fairy Golf Course (see **Attachment 3**).
16. The Port Fairy Flood Emergency Plan (**Attachment 4**) identifies that access north along Griffiths Street is impacted in a 1-in-5-year flood event, and that access at the Gipps Street Bridge is impacted in a 1-in-200-year event<sup>5</sup>.
17. We understand this is the scenario Mr Swan referred to in his expert witness statement. We note at page 17 of Mr Swan's statement, Mr Swan expresses the following concern<sup>6</sup>:

I do have concerns regarding the application of an aspect of the LFDP in the existing townships areas under Sections 6.3 of the plan. Specifically, this relates to the access criteria which may be along existing council owned roads that are not in the control of the applicant. For example, there are a number of properties along Griffiths Street which are partially impacted by flooding, but would have no access that meets the requirements of Section 6.3. This provision would effectively remove the ability of those properties to replace the existing building and could effectively increase the potential flood damage and flood risk to occupants at these locations.

Emphasis added

18. At page 19 of his evidence, Mr Swan notes:

I note that the provision includes the use of the words "not less than 0.8m" in its wording. As described above in section 9.1 of my evidence, the adoption of a 0.8m sea level rise provision, with an allowance for freeboard, provides an identical practical outcome for the nominal flood protection level. However, it is considered that site access provisions will be shown as more constrained under 1.2m sea level rise conditions than 0.8 sea level rise conditions. In my view, site access provisions should have further considerations in the LFDP, such that they do not unreasonably sterilise land, especially where the access is along a council road.

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<sup>5</sup> [Moyne Shire Flood Emergency Plan 2021](#), Figure 32, Appendix C1: Port Fairy Flood Emergency Plan (page 53).

<sup>6</sup> Expert Witness Statement of Rob Swan of HARC, 15 August 2022 (page 17)



19. Our Client shares Mr Swan's concerns.

### **Port Fairy Local Floodplain Development Plan (December 2021)**

20. The Port Fairy Local Floodplain Development Plan is proposed to be an incorporated document within the Scheme.

21. The Port Fairy Floodplain Development Plan seeks to establish minimum performance criteria for development applications for land that is affected by the Floodway Overlay (FO) and the Land Subject to Inundation Overlay (LSIO) in Port Fairy and surrounding areas.

22. The exhibited Port Fairy Floodplain Development Plan (December 2021) (**Document 1**) provides mandatory and discretionary performance criteria for new or replacement buildings (Clause 6.3). These include:

#### **6.3 New or replacement buildings**

**New or replacement buildings (excluding outbuildings and sheds) must have a floor level finished at or above the NFPL**, which is the estimated 1% AEP flood level for the 1.2m mean sea level rise scenario. *Emphasis added*

**New or replacement buildings (excluding outbuildings and sheds) should:** *Emphasis added*

- **be sited on the highest available natural ground**, unless it can be demonstrated to the satisfaction of the responsible authority and the Floodplain Management Authority that this is not viable;
- **have an accessway to the building envelope that:**
  - **does not traverse land where the flood depth is estimated to exceed 300mm during a 1% AEP flood event under the 1.2m sea level rise scenario; and**
  - **is not subject to flooding where the product of depth and velocity (VxD) exceeds 0.4 metres squared per second during the 1% AEP flood event;**

23. The above performance criteria are generally supported by our Client subject to a qualification on how 'accessway' is defined in the Port Fairy Local Floodplain Development Plan.

24. We note, the Port Fairy Local Floodplain Development Plan uses three interchanging undefined terms to describe access ('access', 'accessway', and 'access pathway').

25. Our Client submits the inclusion of a definition within Port Fairy Local Floodplain Development Plan for 'accessway' would be beneficial.

26. The Department of Transport provides a useful definition for 'accessway':

Accessway or driveway: **An accessway relates to the path used to approach the road from within a property. It refers to what is happening within the site only, not on the road reserve. An accessway is also referred to as a driveway.**<sup>7</sup>

27. Our Client submits the above definition should be adopted and submits that the Panel recommends the inclusion of the above definition (or similar definition) within the Port Fairy Local Floodplain Development Plan (see **Attachment 5** for track change Part A version).
28. The Panel is also requested to recommend the Port Fairy Local Floodplain Development Plan be reviewed to ensure consistency in the use of terms relating to access (see **Attachment 5** for track change Part A version).
29. The above requests will ensure that land is not unreasonably sterilised, especially where the access is along a council road (such as Griffiths Street).

### **Port Fairy Local Floodplain Development Plan (September 2022)**

30. The Part A version of the Port Fairy Local Floodplain Development Plan (September 2022) (**Document 88, Appendix 6**) includes a new section which relates to New Buildings (New Section 6.3). Aside from duplicating requirements within the renumbered Section 6.4, the Part A version proposes to remove the flexibility for landowners to provide innovative responses to flood issues.
31. The Part A version has removed the use of the word 'should' in favour of the word 'must'. The Part A version also introduces new requirements regarding the siting of new buildings as follows.

#### **6.3**

#### **New buildings**

New buildings **must** be sited on land where the flood depth does not exceed 500 millimetres and/or the product of velocity and depth (VxD) does not exceed 0.4 metres squared per second; and

- **must** have an accessway to the building envelope that:
  - does not traverse land where the flood depth is estimated to exceed 300mm during the planned for 1% AEP flood event; and
  - is not subject to flooding where the product of depth and velocity (VxD) exceeds 0.4 metres squared per second during the planned for 1% AEP flood event.

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<sup>7</sup> [DOT Planning process glossary](#)

32. Our Client is concerned about the removal of discretion relating to siting and site access.

33. At page 17 of his witness statement, Mr Swan notes:

With the exception noted above, the LFDP appears to provide reasonable flexibility for applicants to provide innovative responses to flood related issues. I note that although the LFDP nominates the NFPL, it allows for the GHCMA to vary that level in response to the specific application, if necessary. The NFPL adopted is effectively equivalent to that that would be calculated using the approach adopted by Melbourne Water, noting that this nominally uses a 0.8m sea level rise.

34. Our Client is concerned the Part A version of the Port Fairy Local Floodplain Development Plan seeks to remove the very flexibility Mr Swan supported.

35. The Panel is requested to adopt the wording used in the exhibited (December 2021) version of the Port Fairy Local Floodplain Development Plan (see **Attachment 5** for track change Part A version).

36. The above request will provide flexibility for landowners to provide innovative responses to flood issues within existing township areas.

### **Conclusion**

37. Our Client thanks the Panel for the opportunity to explain their concerns.

\_\_\_\_\_  
[Redacted]  
[Redacted]  
[Redacted]

16 September 2022

**ATTACHMENT 1 - SUBJECT SITE**





revision	description	date

project:  
C69 Submission - 196 Griffiths Street, Port Fairy

drawing title:  
Site Plan

date:  
16/09/2022

scale:  
NTS **A4**

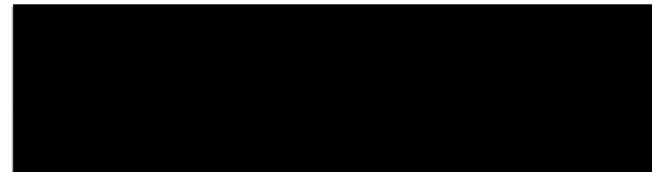
drawn by:  
SM

project no.:  
20-089



**ATTACHMENT 2 - VACANT SITES, GRIFFITHS STREET**





revision	description	date

project:  
 C69 Submission - 196 Griffiths Street, Port Fairy

drawing title:  
 Vacant Sites

date:  
 16/09/2022

scale:  
 NTS **A4**

drawn by:  
 SM

project no.:  
 20-089



**ATTACHMENT 3 - FLOOD AFFECTED ACCESS, GRIFFITHS STREET**





revision	description	date
-	-	-

project:  
C69 Submission - 196 Griffiths Street, Port Fairy

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drawing title:  
Griffiths Street - Access

date:  
16/09/2022

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scale:  
NTS **A4**

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drawn by:  
SM

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project no.:  
20-089



**ATTACHMENT 4 - PORT FAIRY FLOOD EMERGENCY PLAN**

## Appendix C1: Port Fairy Flood Emergency Plan

Port Fairy is impacted by riverine, stormwater and storm surge flooding. Port Fairy has experienced frequent riverine flooding from the Moyne River. The upper reaches of the Moyne River begins 7 km south of Mount Rouse, near Penshurst. The Moyne River flows through Willatook, Toolong, the Belfast Lough where it receives inflows from Murray Brook, then flows through Port Fairy. The catchment area of Moyne River is approximately 758 km<sup>2</sup>.

There are several tributaries of Moyne River that provides inflow, these include Murray Brook, Nardoo Creek, Back Creek, Reedy Creek and the Holcombe Drain. Murray Brook begins north of Kirkstall, flowing through Kirkstall, Crossley, Rosebrook and Killarney before it enters the Belfast Lough, where it joins the Moyne River. Hydrologic modelling (Water Technology 2008) indicates that while Murray Brook contributes to 23% of the peak Port Fairy flood flow during a 1 in 100 year AEP flood event. However this contribution is highly variable due to the spatial variation of rainfall intensity. An example of this occurred during the October 2020 flood event. Heavy localised rainfall in the upper reaches of Murray Brook increased the contribution of Murray Brook flood flows to flooding in Port Fairy.

The October 2020 flood event was the largest recent flood event recorded in Port Fairy, a 1 in 20 year flood. This event caused considerable damages to buildings, roads, bridges and other infrastructure not only in Port Fairy, but also in Kirkstall, Koroit, Crossley, Rosebrook and Killarney. Deep flooding impacted over 63 buildings, including 47 buildings at the Port Fairy Gardens Caravan Park, which was evacuated. More than 12 buildings were impacted by flooding north of Port Fairy in Kirkstall, Koroit, Crossley, Rosebrook and Killarney. An additional four buildings were flooded above floor in Port Fairy. Minor and major roads are impacted by flooding within and surrounding Port Fairy, these include Griffiths Street, Deepwell Road, Bonnets Road, Penshurst-Port Fairy Road, Koroit-Port Fairy Road, Ritchie Street, Manifold Street, Skenes Road, Korongah Road, Korongah North Road and Daltons Road. Deep flooding cut access to Skenes Road, Daltons Road, Manifold Street, Korongah Road and Korongah North Road.

There are four gauges along the Moyne River that provide flood warning for Port Fairy, these include Gerrigerrup, Willatook, Toolong and Port Fairy. The estimated travel time between heavy rainfall in the upper Moyne River catchment to steep rise in streamflow at Port Fairy can varied between 18 to 28 hours. The flood peak travel time between heavy rainfall in the upper catchment and the flood peak arriving in Port Fairy can vary between 1 to 1.5 days.



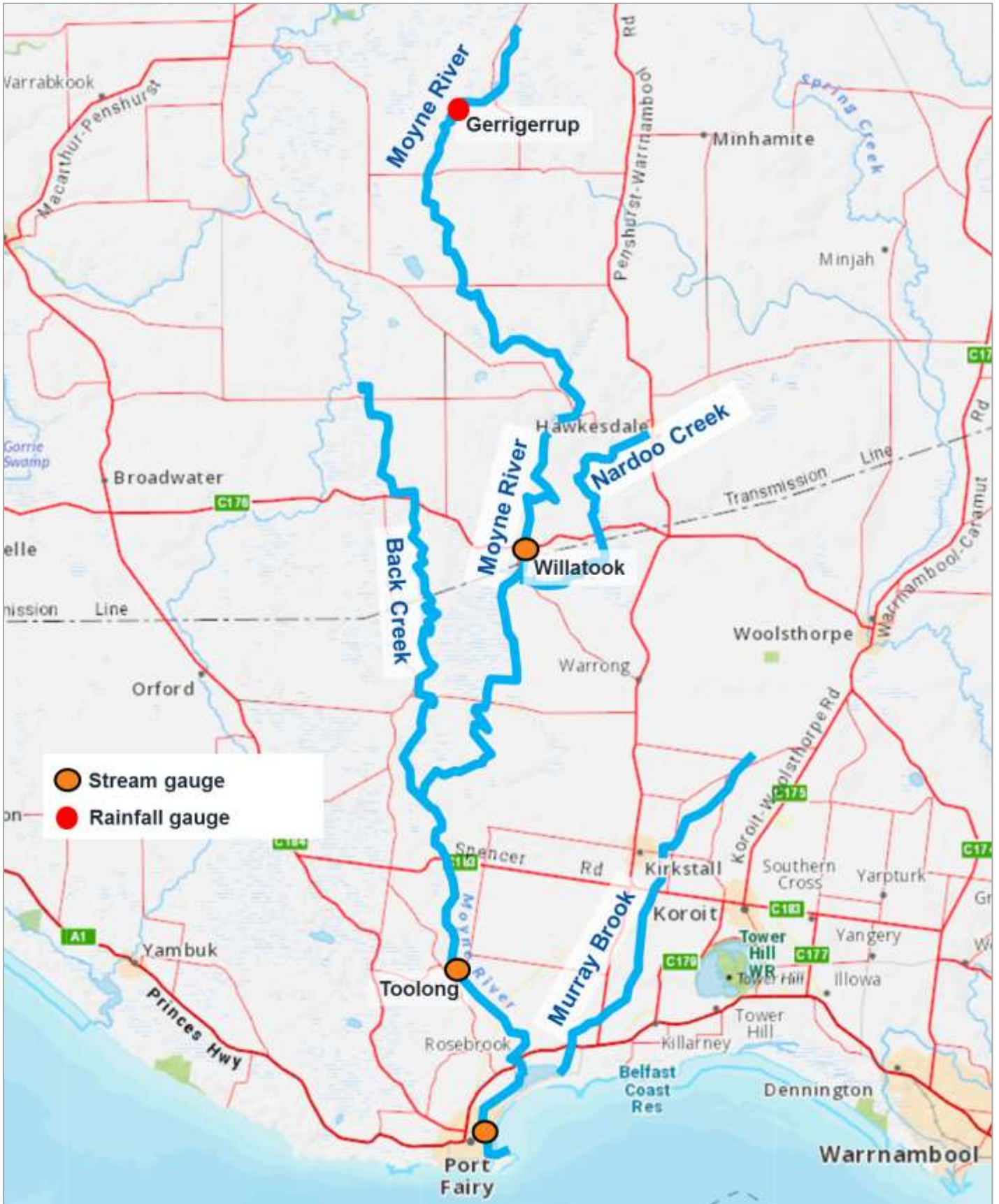


Figure 4. Port Fairy waterways and stream gauges.





Figure 5. Port Fairy waterways and stream gauges.

## Historic Riverine Floods

Stream records show that Port Fairy has experienced frequent flood events since the early 1970's, refer to graph below. The largest flood event on record was in 1946, refer to flood photos below. More recently Port Fairy has experienced floods in 1975, 1976, 1978, 1983, 1984, 1996, 2001, 2010, 2016 and 2020. The October 2020 flood event was the largest recent flood event on record.

The Moyne River stream gauge at Toolong was used to indicate historic flood events that have occurred in Port Fairy.

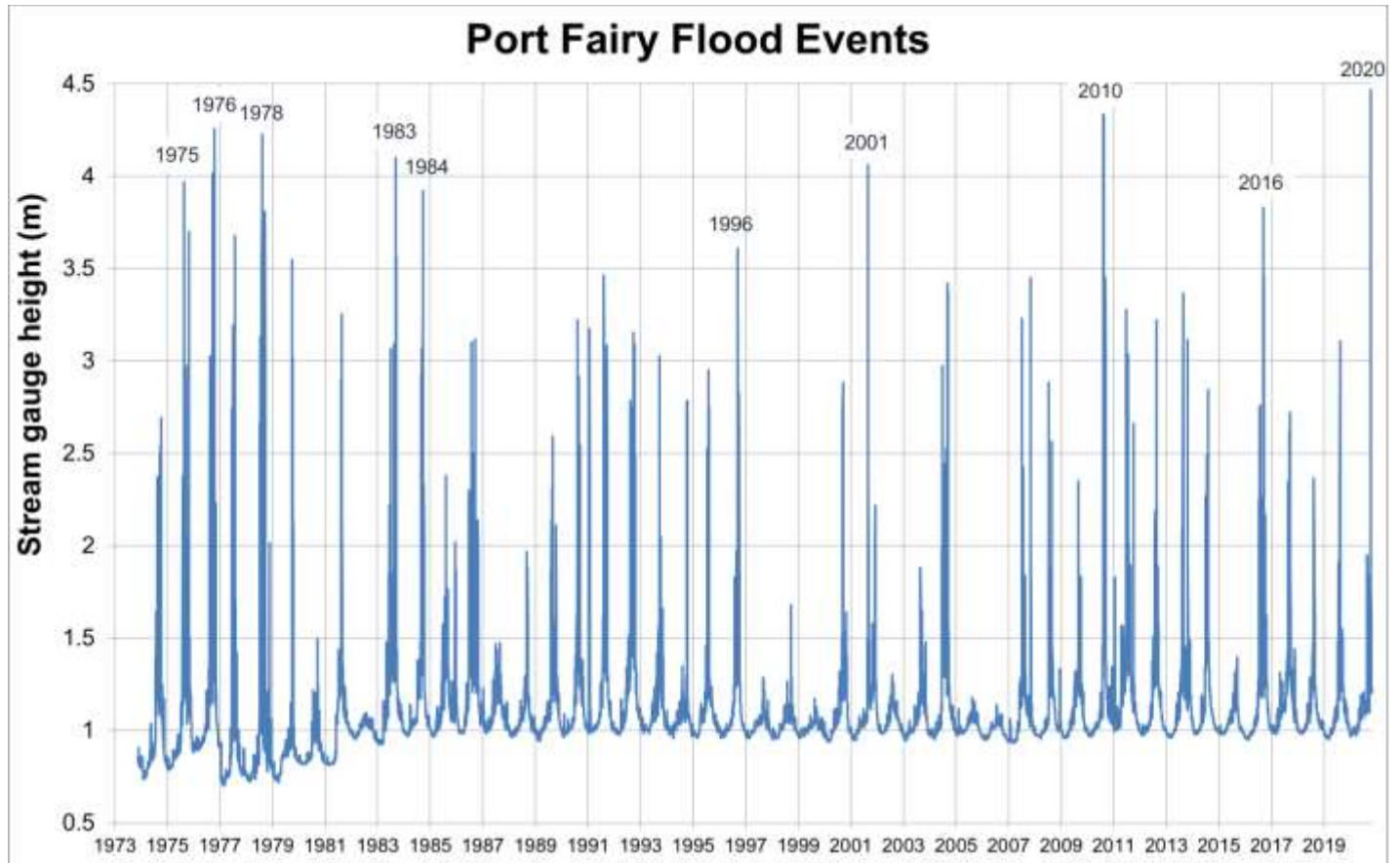


Figure 6. Port Fairy historic flood events.



Figure 7. The Rosebrook Bridge along the Princes Highway washed away in the 1946 flood.





Figure 8. Flooding at the Port Fairy Gardens Caravan Park in 1946.



Figure 9. Flooding of the Caledonian Inn in Bank Street, Port Fairy in 1946, the largest flood on record.

## October 2020 flood event

The October 2020 flood was Port Fairy's largest recent flood event on record, estimated to be approximately a 1 in 20 year AEP event. Penshurst (the upper Moyne River catchment area) recorded 79.4 mm of rainfall over 5 days, with 38mm on the 8<sup>th</sup> of October. This highest daily rainfall was recorded on the 8<sup>th</sup> with 80 mm falling at Warrnambool. Significant flooding occurred in Port Fairy, Kirkstall, Koroit, Crossley, Rosebrook and Killarney between the 8th and 11th of October 2020.

The October 2020 flood event was the largest recent flood event recorded in Port Fairy, a 1 in 20 year flood. Refer to the flood photos below. This event caused considerable damages to buildings, roads, bridges and other infrastructure. This event caused considerable damages to buildings, roads, bridges and other infrastructure not only in Port Fairy, but also in Kirkstall, Crossley, Koroit, Rosebrook and Killarney. Deep flooding impacted over 63 buildings, including 47 buildings at the Port Fairy. The Gardens Caravan Park was evacuated for 3 days. More than 12 buildings were impacted by flooding north of Port Fairy in Kirkstall, Koroit, Crossley, Rosebrook and Killarney. More than four buildings were flooded above floor in Port Fairy. Refer to maps below showing buildings impacted.

Minor and major roads were impacted by flooding within and surrounding Port Fairy, these include Griffiths Street, Deepwell Road, Bonnets Road, Penshurst-Port Fairy Road, Koroit-Port Fairy Road, Ritchie Street, Manifold Street, Skenes Road, Korongah Road, Korongah North Road and Daltons Road. Deep flooding cut access to Skenes Road, Daltons Road, Manifold Street, Korongah Road and Korongah North Road. For more details regarding flood impacts refer to the Port Fairy Flood Intelligence Card below.



Figure 10. Flooding impacting a house in Griffiths Street, Port Fairy during the October 2020 flood event.





Figure 11. Flooding impacting houses in Ritchie Street, Port Fairy during the October 2020 event.



Figure 12. Flooding impacted a house in Deepwell Road, Crossley during the October 2020 event.



Figure 13. Flooding impacting Port Fairy, north of Manifold Street during the October 2020 event.



Figure 14. Deep flooding along Skenes Road cut access to the Port Fairy Golf Club during the October 2020 event.





Figure 15. Flooding impacting the Port Fairy Gardens Caravan Park during the October 2020 event.



Figure 16. A cabin impacted by flooding at the Port Fairy Gardens Caravan Park during the October 2020 event.

Anecdotal information collected during historic flood events was also used to determine assets at risk of flooding. Flood damages recorded in the VICSES Request of Assistance Database during the October 2020 flood event show there were a significant number of buildings impacted by flooding in Killarney, Koroit, Crossley, Kirkstall and Rosebrook. Currently there is little flood risk mapping available, and no building damages information for these areas. Refer to the maps below for areas where there are considerable gaps in flood risk mapping.

Given there are significant gaps in flood risk mapping and a high number of buildings at risk of flooding, it is a high priority to revise the Port Fairy 2008 Flood Study to develop flood risk information for the whole Moyne River catchment area.

This anecdotal information collected during the October 2020 flood can be used as a guide to indicate buildings that may be at risk of flooding during future flood events. This anecdotal building damage information only indicates buildings that may be at risk of above floor flooding, some of these buildings may have been impacted by localised runoff (not riverine flooding). It's important to note this anecdotal information has a low level of accuracy and should be used as a guide only. For maps and tables that indicate buildings impacted by flooding during the October 2020 event, refer to table 4 and figures 17 to 18 below.



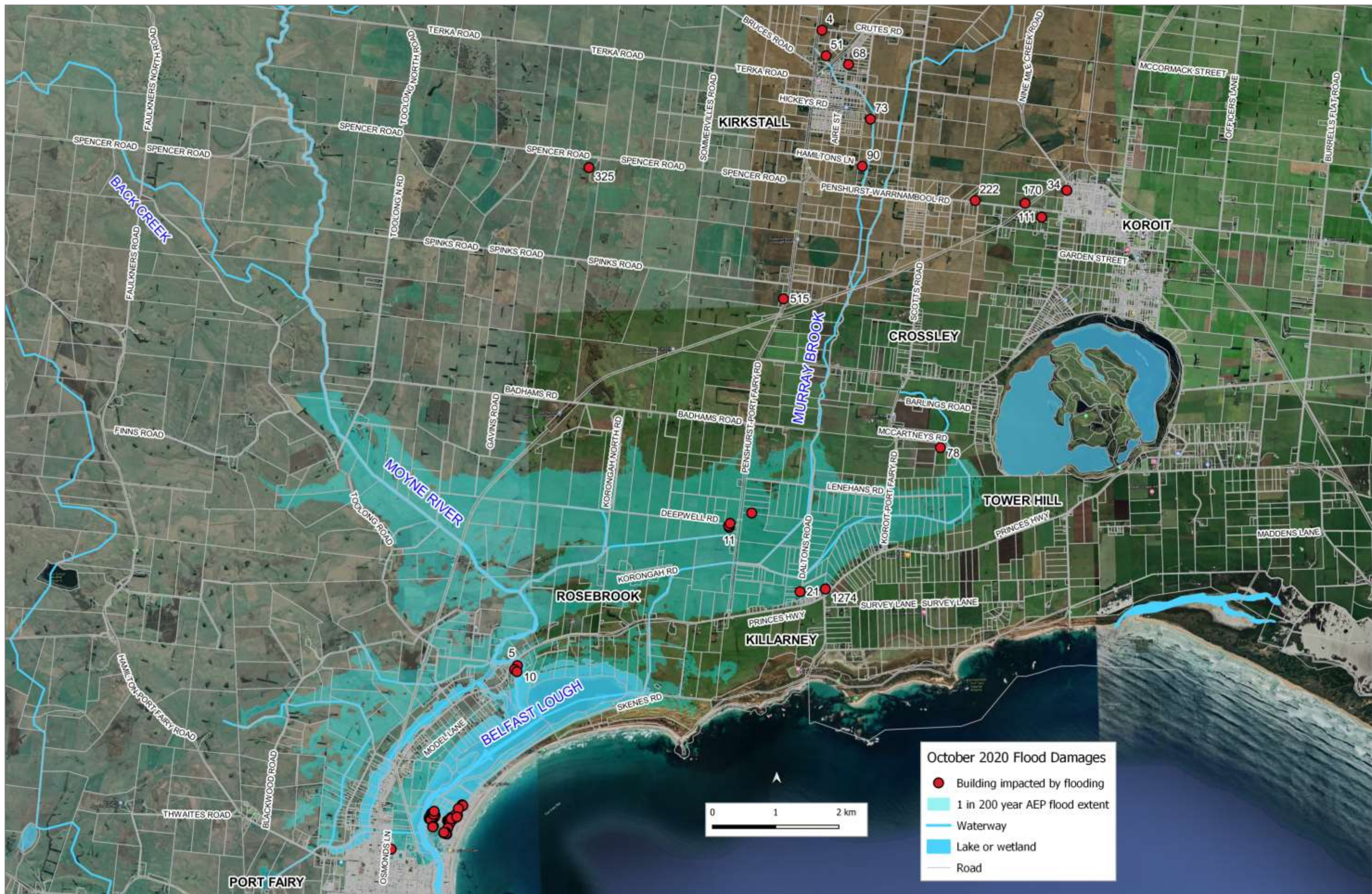


Figure 17. Buildings impacted by flooding during the October 2020 event within the Moyne River catchment (VICSES Request for Assistance Database, VICSES Port Fairy Unit and other anecdotal information).



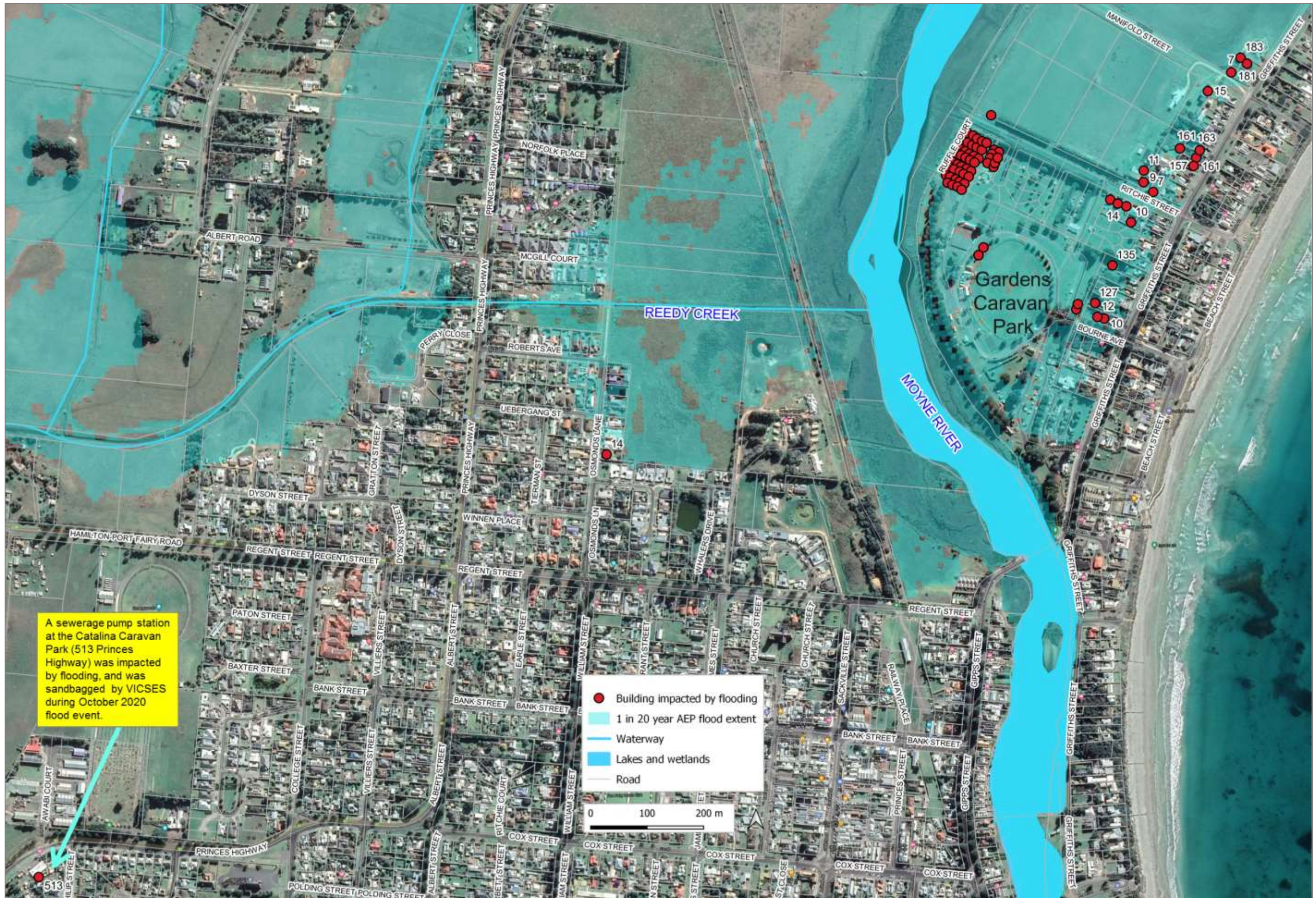


Figure 18. Buildings impacted by flooding during the October 2020 event within the Moyne River catchment (VICSES Request for Assistance Database, VICSES Port Fairy Unit and other anecdotal information).



**Table 4. Buildings impacted by flooding, October 2020 event.**

Anecdotal information collected during the October 2020 flood event was used to indicate buildings at risk of flooding given no floor level survey has been undertaken within the Moyne River catchment to indicate buildings at risk of flooding. Below is a list of buildings impacted by flooding, recorded in the VICSES Request for Assistance Database and other anecdotal sources during the October 2020 flood event. It's important to note the building damage information below only indicates buildings that may be at risk of above floor flooding and should be used as a guide only.

No	Address	Date	Time	Comments
1	5 Lydiard Street, Rosebrook	08/10/2020	-	Sandbagging prevented over floor flooding.
2	10 Lydiard Street, Rosebrook		-	Flooding threatening the house, sandbags provided
3	1274 Princes Highway, Killamey	08/10/2020	18:28	Flooding below floor threatening the house.
4	21 Daltons Rd, Killamey	09/10/2020	7:31	Flooding below floor threatening the house. House sandbagged. Access was cut to the house.
5	11 Deepwell Road, Crossley	08/10/2020	18:24	The house was flooded above floor.
6	170 Peshurst-Port Fairy Road, Crossley	09/10/2020	10:17	Flooding threatening the house, requested sandbags.
7	78 McCartney's Road, Crossley	08/10/2020	12:52	Flooding threatening the house, requested sandbags.
8	4 Cruites Road Kirkstall, near Peshurst -Warrnambool Rd	08/10/2020	3:26	House impacted by above floor flooding.
9	50 Spencer Street, Kirkstall	08/10/2020		House was threatened by above floor flooding. Owners sandbagged the house to prevent above floor flooding.
10	45 Aire Street, Kirkstall	08/10/2020		Water flowing under house. Sandbags provided to protect the house.
11	325 Spencer Rd Kirkstall, near Toolong North Rd.	08/10/2020	10:35	Flooding threatening the house, requested sandbags.
12	73 Hickeys Road, Kirkstall	08/10/2020	7:45	Flooding threatening the house, sandbags provided
13	51 Atkinson Street, Kirkstall	08/10/2020	6:26	Flooding threatening the house, sandbags provided
14	90 Hamiltons Lane Kirkstall	08/10/2020	9:08	Flooding threatening the house, requested sandbags.
15	515 Peshurst-Port Fairy Road, Kirkstall	08/10/2020	17:50	Flooding threatening the house, requested sandbags.
16	68 Aire St, Kirkstall	08/10/2020	20:24	Flooding entering the house.
17	1085 Tower Hill Rd, Koroit	08/10/2020	8:30	Flooding entering the house.
18	34 Nine Mile Creek Road Koroit	08/10/2020	19:39	Flooding below floor threatening the house. House sandbagged.
19	222 Peshurst -Warrnambool Road, Koroit Pet Resort, Koroit	08/10/2020	4:58	Flooding entering the Koroit Pet Resort buildings. Buildings were impacted by deep above floor flooding.
20	111 Peshurst-Warrnambool Road, Koroit	08/10/2020		Flooding threatening the house due to ground water coming into the house. House was sandbagged to prevent above floor flooding.
21	170 Peshurst-Warrnambool Road, Koroit	09/10/2020	10:17	Flooding threatening the house and shed. House front door and shed sandbagged.
22	34 Nine Mile Creek Road, Koroit	08/10/2020	19:39	Flooding below floor threatening the house. House sandbagged.
23	14 Osmonds Lane, Port Fairy	9/10/2020	11:09	Flooding threatening the house, requested sandbags.
24	161 Griffiths Street, Port Fairy	10/10/2021	-	Flooding above floor of the house and shed. Sewerage rising in toilets, sandbags provided to prevent impacts.
25	163 Griffiths Street, Port Fairy	10/10/2021	-	Flooding above floor of the house and garage.
26	111 Griffiths Street, Gardens Caravan Park Cabins, Port Fairy	10/10/2021	-	More than 60 cabins were impacted by flooding (some above floor)
27	111 Griffiths Street, Gardens Caravan Park buildings, Port Fairy	10/10/2021	-	More than 4 buildings were impacted by flooding (some above floor)
28	10 Bourne Ave, Port Fairy	10/10/2021	-	House impacted by flooding below floor.
29	10 Ritchie Street, Port Fairy	10/10/2021	-	Shed impacted by flooding above floor.
30	11 Ritchie Street, Port Fairy	10/10/2021	-	Shed impacted by flooding above floor.
31	12 Bourne Ave, Port Fairy.	10/10/2021	-	House impacted by flooding below floor.
32	12 Ritchie Street, Port Fairy.	10/10/2021	-	House impacted by flooding below floor.
33	127 Griffiths Street, Port Fairy	10/10/2021	-	House impacted by flooding below floor. Shed impacted above floor.
34	135 Griffiths Street, Port Fairy	10/10/2021	-	Shed impacted by flooding above floor.
35	157 Griffiths Street, Port Fairy	10/10/2021	-	House impacted by flooding below floor.
36	14 Ritchie Street, Port Fairy	10/10/2021	-	House impacted by flooding below floor.

37	15 Manifold Street, Port Fairy	10/10/2021	-	House impacted by flooding below floor.
38	16 Ritchie Street, Port Fairy	10/10/2021	-	House impacted by flooding below floor.
39	181 Griffiths Street, Port Fairy	10/10/2021	-	Shed impacted by flooding above floor.
40	183 Griffiths Street, Port Fairy	10/10/2021	-	Shed impacted by flooding above floor.
41	7 Manifold Street, Port Fairy	10/10/2021	-	Pump station was sandbagged
42	2/7 Ritchie Street, Port Fairy	10/10/2021	-	Flooding threatening the shed, requested sandbags. The cellar was impacted by flooding.
43	9 Ritchie Street, Port Fairy	10/10/2021	-	House flooded above floor, pumping was undertaken to get floodwater out of the house.
44	513 Princes Highway, Catalina Caravan Park, Port Fairy	10/10/2021		Pump station was sandbagged.



## Riverine flood behaviour

During flood events, waterways that contribute flows to Port Fairy include the Moyne River, Murray Brook, Holcombe's Drain and Reedy Creek. Modelling shows that the majority of flows are contributed by the Moyne River, refer to the image below. However during the October 2020 flood event anecdotal information suggests there was a higher percentage of floodwater contribution from the Murray Brook waterway compared to the design model contribution. This was due to heavy localised rainfall in the upper reaches of Murray Brook during this flood event. Given the contribution of Murray Brook flows to flooding in Port Fairy, a temporary PALS stream gauge has been installed at Lenehans Road to monitor the Murray Brook flows. This gauge is only installed temporarily during periods of high flood risk.

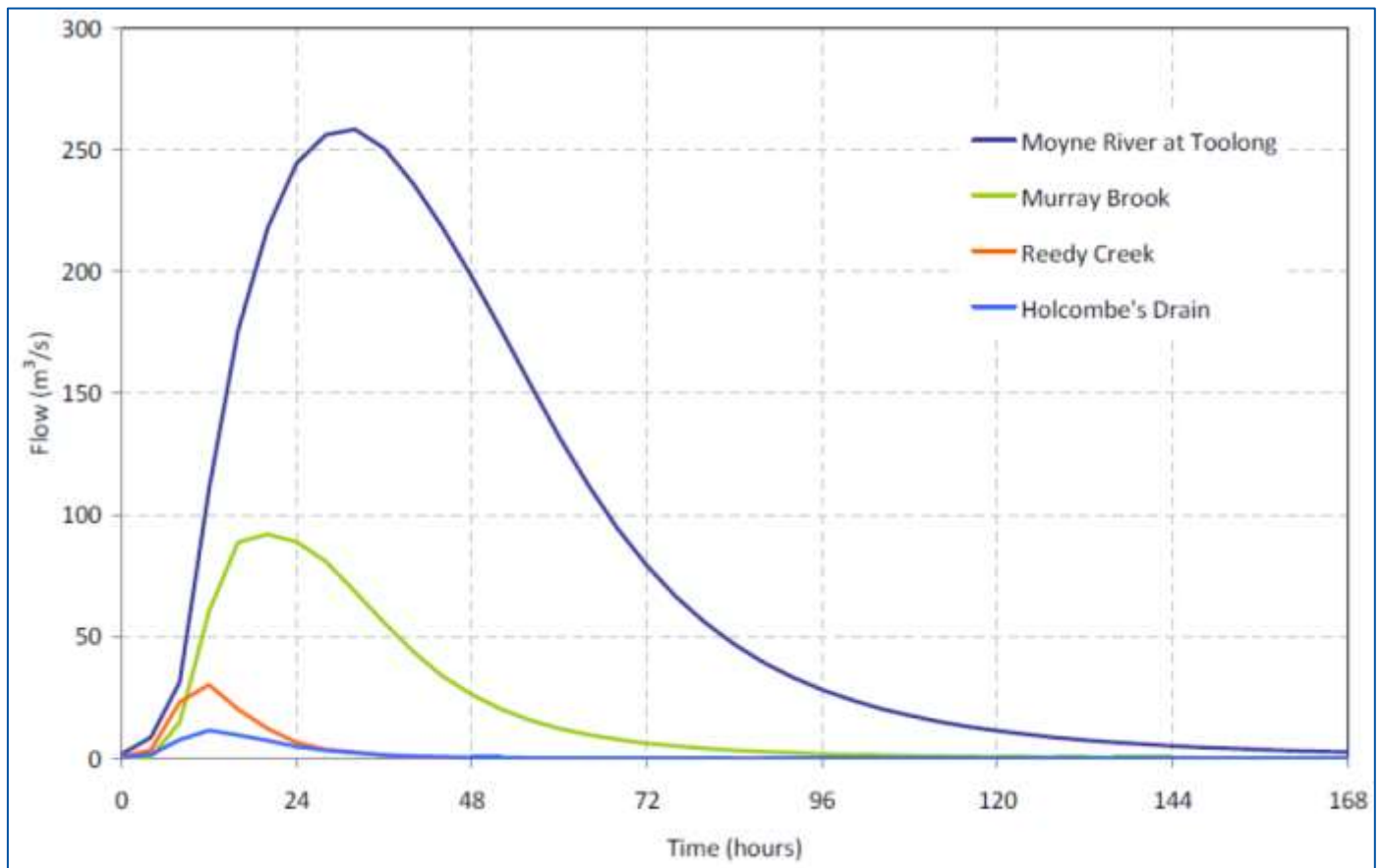


Figure 19. Contribution of flows to Port Fairy during a 100 year ARI flood event (Water Technology 2008)

A section of the Moyne River between Toolong and Rosebrook is an artificial channel that was excavated through the floodplain to improve drainage of the surrounding areas and to reduce nuisance flooding. Spoil from the excavation was deposited on the banks of the channel forming a small levee along part of its length. The Moyne River channel capacity is limited and high flows leave the Moyne River south of Toolong and flow east towards the Korongah Flats. Localised breakouts begin to occur from a flow of about 2,600 – 3,000 ML/d at Toolong. These breakout flows are stored on the Flats. This acts to attenuate flows into Belfast Lough and reduces the impact of flooding in Port Fairy. The Belfast Lough also provides significant flood storage and mitigates peak flood flows through the Moyne River Estuary.

## Tide Influence

Modelling undertaken as part of the Port Fairy Flood Study (Water Technology 2008) showed that the influence of high tides or king tides can back up the Moyne River to the Gipps Street Bridge during large flood events, 1 in 100 year AEP events (Water Technology 2008). However the influence of tides can now be tested during flood events using the newly installed stream gauge in Port Fairy, adjacent to the Gardens Caravan Park.

During flood events high tides reduce the rate that floodwater flows out of the Moyne River into ocean. High tides may extend the duration of flooding in Port Fairy. However, low tides increase the rate of floodwater flow into the ocean. It's important to monitor the tides during flood events to assess the likely influence on the duration of flooding in Port Fairy.

## Gipps Street Bridge

Anecdotal information from historic flood events indicate that debris, such as large hay bales build up on the upstream side of the Gipps Street Bridge. This is likely to occur during flood events larger than a 1 in 10 year flood event. Build-up of debris is likely to compromise the integrity of the Bridge. When there is a build-up of debris a long arm excavator is needed to remove the debris. Given the likelihood of this occurring and consequence of damage to the Bridge cutting access, VICSES will ensure a long arm excavator is on standby during flood events greater than a 1 in 10 flood event.

During small flood events, 1 in 10 year AEP floodwater cuts access to Skenes Road. Flood modelling indicates that access to the Gipps Street Bridge may be cut during a 1 in 200 flood event (Glenelg Hopkins CMA). While flooding may not overtop the Gipps Street Bridge, flooding may overtop the abutments to the Gipps Street Bridge, the adjacent section of road. Refer to the map below showing where the abutments may be overtopped by floodwater during a 1 in 200 year flood event.

It is important to note that if flooding cuts access to the Gipps Street Bridge, this will isolate more than 150 buildings for more than 12 hours. Refer to map below showing the buildings that may be isolated. It is recommended that when there is an indication that flooding will reach a 1 in 200 year AEP flood event, the Victoria Police evacuation team may need to coordinate door knocking of residents at risk of being isolated. This will allow residents to decide to leave before the flood peak arrives, cutting access. Key messages to communicate to residents when undertaking door knocking include;

- Access to the Gipps Street Bridge will be cut, you may be isolated for 12 to 24 hours
- Your sewerage system may be impacted by flooding and may not work.
- You must leave now if you choose to do so. Emergency Services do not have the capacity to assist everyone when access is cut.



Figure 20. Flooding impacting the Gipps Street Bridge during a 1 in 200 year AEP flood event.





Figure 21. Griffiths Street residents isolated by flooding during a 1 in 200 year flood event.



## Albert Road Buildings Isolated

Flood modelling indicates that access to Albert Road may start to be impacted during a 1 in 50 flood event (Glenelg Hopkins CMA). Deep flooding is likely to cut access during a 1 in 100 year flood event. If flooding cuts access to Albert Road, this will isolate more than 30 buildings for more than 12 hours. Refer to map below showing the buildings that may be isolated.

It is recommended that when there is an indication that flooding will reach a 1 in 100 year AEP flood event, the Victoria Police evacuation team may need to coordinate door knocking of residents that may be isolated. Refer to key messages listed above that can be provided to residents when undertaking door knocking.

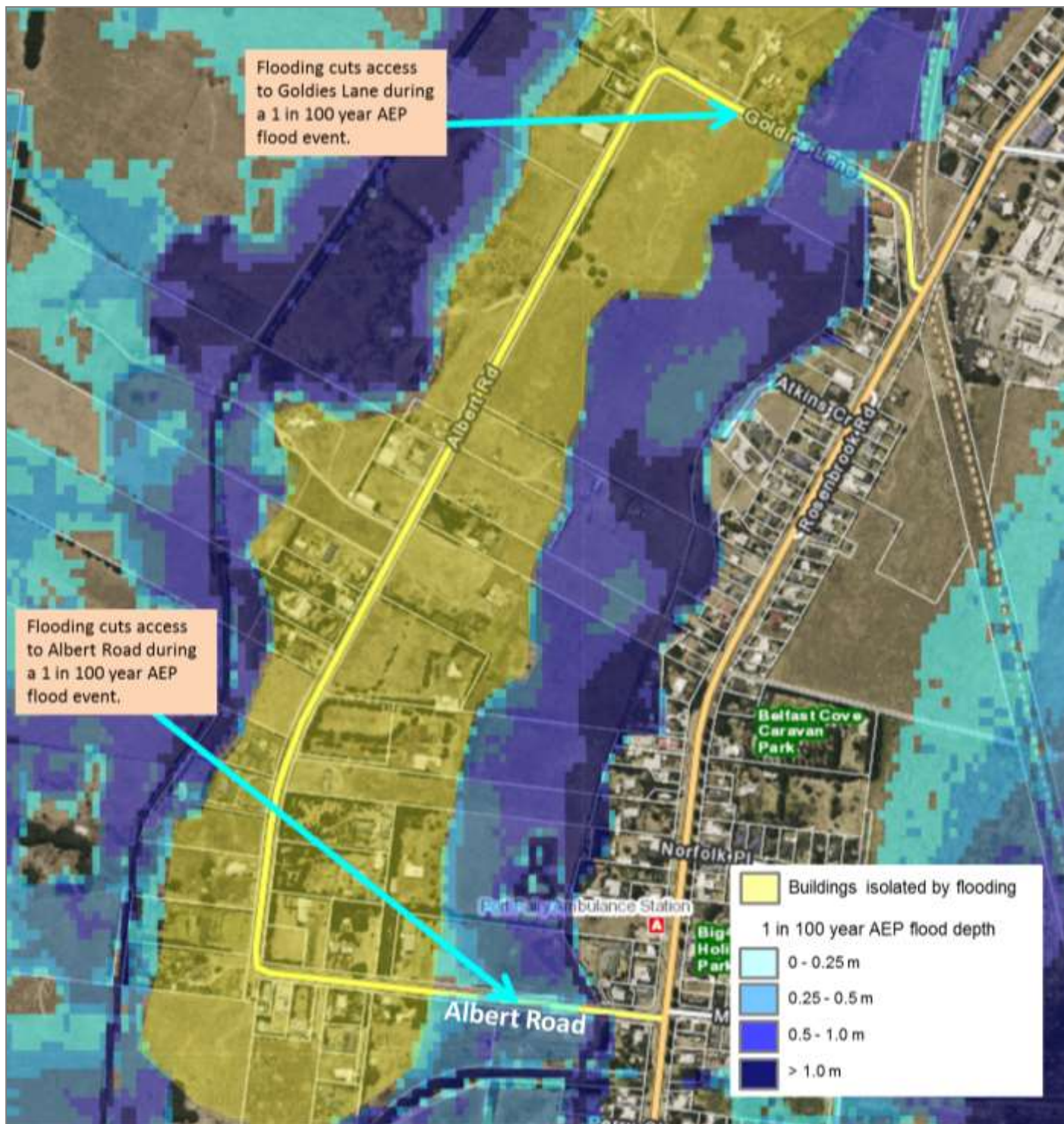


Figure 22. Albert Road residents isolated by flooding during a 1 in 100 year flood event.

## Warning time

Currently there are four stream and rainfall gauge locations along the Moyne River, these include Gerrigerrup (south of Mt Rouse), Willatook, Toolong and Port Fairy. Refer to the maps in figures 4 and 5 above for the gauge locations.

Recently DELWP have installed a temporary stream gauge along Murray Brook at Lenehans Road. This stream gauge is described as a Portable Automated Logger Systems (PALS) and has been temporarily installed during times of high flood risk, during October 2020 to January 2021.

The estimated travel time between heavy rainfall in the upper Moyne River catchment to steep rise in streamflow at Port Fairy can vary between 18 to 28 hours. The flood peak travel time between heavy rainfall in the upper catchment and the flood peak arriving in Port Fairy can vary between 1 to 1.5 days. These estimates are based in informaiotn from the Port Fariy 2008 Flood Study and anecdotal informaiton collected during the October 2020 flood event.

During the October 2020 flood event the flood peak was maintained at Port Fairy for more than one day, refer to the table and hydrograph below.

Table 5. Travel time of flood peaks within the Moyne River Catchment.

Location from	Location to	October 2020 flood travel time (hours)
Start of rainfall early morning 8th	Moyne River @ Toolong 9:45pm 9th	6 (to start of rise) 20.75 (to peak)
Moyne River @ Toolong 9:45pm 9th	Moyne River @ Port Fairy 1pm 10th	15.75
Start of rainfall early morning 8th	Moyne River @ Port Fairy 1pm 10th	36.5
Murray Brook @ Kirkstall 3am 8th	Murray Brook @ Crossley 6:30pm 8th	15.5
Murray Brook @ Crossley 6:30pm 8th	Murray Brook @ Killarney 1pm 9th	18.5
Murray Brook @ Killarney 1pm 9th	Murray Brook @ Rosebrook 3am 10th	12
Moyne River @ Rosebrook 3am 10th	Moyne River @ Port Fairy 1pm 10th	10

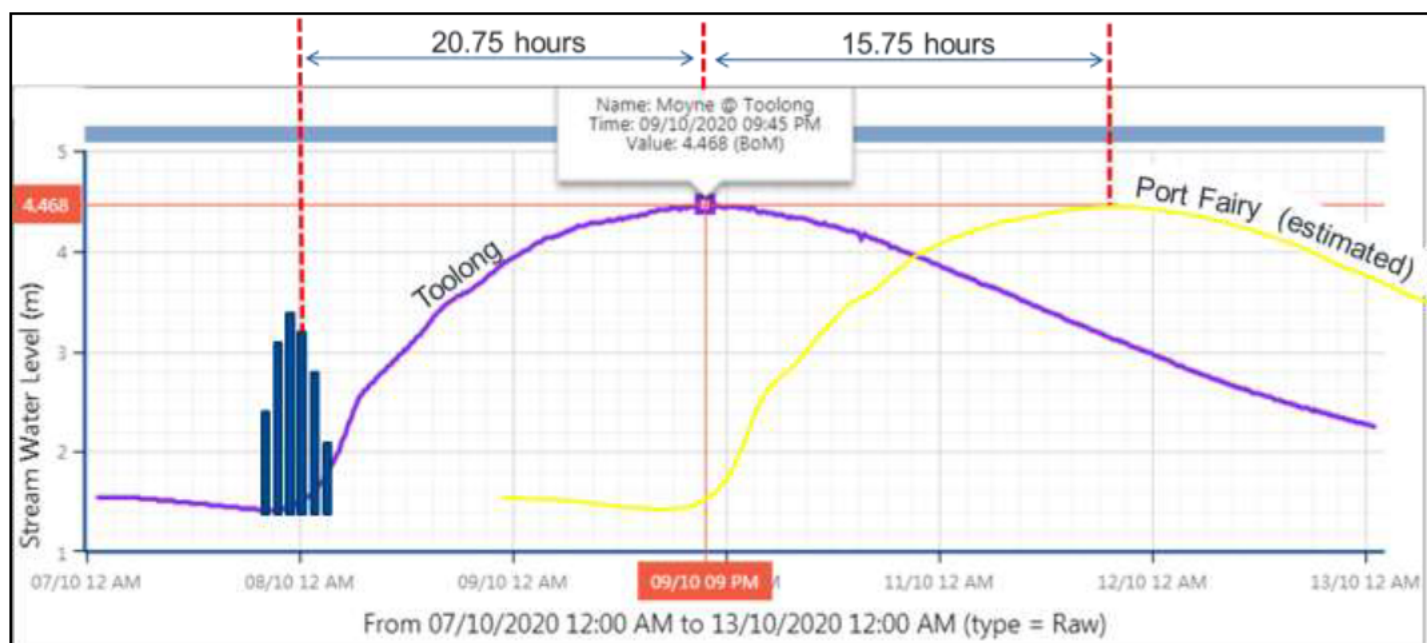


Figure 23. The travel time of the Moyne River flood peak during the October 2020 flood event.



## Stormwater Flooding

While no stormwater mapping is available, anecdotal information indicates the Southcombe Caravan Park (in James Street) is subject to stormwater flooding, refer to photo below. During a heavy rainfall event in August 2010, 205.5mm was recorded over two days. During this event the Caravan Park manager Bob Napier said that flooding was exacerbated because it occurred during high tide. This caused stormwater to build up in the drainage network until low tide eventually allowed stormwater drain out.



Figure 24. Localised flooding at Southcombe Gardens Caravan Park August 2010.

In the absence of stormwater flood mapping, land subject to stormwater flooding has been identified using the land inundated by sea level rise map developed as part of the Port Fairy Flood Study (Water Technology 2008). Refer to the map below showing land inundated by sea level rise (40 cm sea level rise in a 1 in 100 year AEP event). Properties likely to be impacted by stormwater flooding are located adjacent to the Russell Clark Reserve, Southcombe Caravan Park, the Powling Street Reserve and Ocean Drive. This area prone to stormwater flooding has also been verified by Moyne Shire Council staff and member of the VICSES Port Fairy Unit.





Figure 25. Areas in Port Fairy impacted by stormwater and storm surge flooding (Water Technology 2008).



## Estuarine and Storm Surge Flooding

Flooding of an estuary is caused by high river flows not being able to flow into the sea due to high tides or storm surges. Estuarine flooding is known to occur in Port Fairy along the Moyne River. Flooding impacted the Moyne River Estuary on the 24<sup>th</sup> of June 2014 due to a storm surge event. This flood inundated ten properties adjacent to the Port Fairy Wharf, refer to the map below showing the approximate flood event. While there were no buildings recorded to be flooded above floor, the peak flood level was close to flooding a number of floor levels, refer to the flood photos below.



Figure 26. Area impacted by storm surge flooding along the Moyne River Estuary during the June 2014 event.

Storm surge flood events occur when low atmospheric depressions (sea levels can rise significantly above high astronomical tide (HAT)) combine with strong onshore winds. Storm surge flooding infrequently occurs in Port Fairy at the Griffiths Island walkway and impacts properties along Ocean Drive. Refer to photos below.

The area in Port Fairy that is prone to storm surge flooding is shown in the map above. These storm surge impact areas were identified as part of a flood mapping project undertaken by the Moyne Shire Council and the Glenelg Hopkins CMA as part of the Coastal and Structure Planning Project in 2017. The area prone to storm surge flooding has also been verified by Moyne Shire Council staff and member of the VICSES Port Fairy Unit.

Two storm surge flood events have impacted Port Fairy, on the 29<sup>th</sup> of May 2009 and the 24<sup>th</sup> of June 2014. The 2014 event impacted three properties along Ocean Drive (104, 106 and 108). Refer to the map and flood photos below. While there were no buildings recorded to be flooded above floor, the peak flood level was close to flooding these buildings above floor.

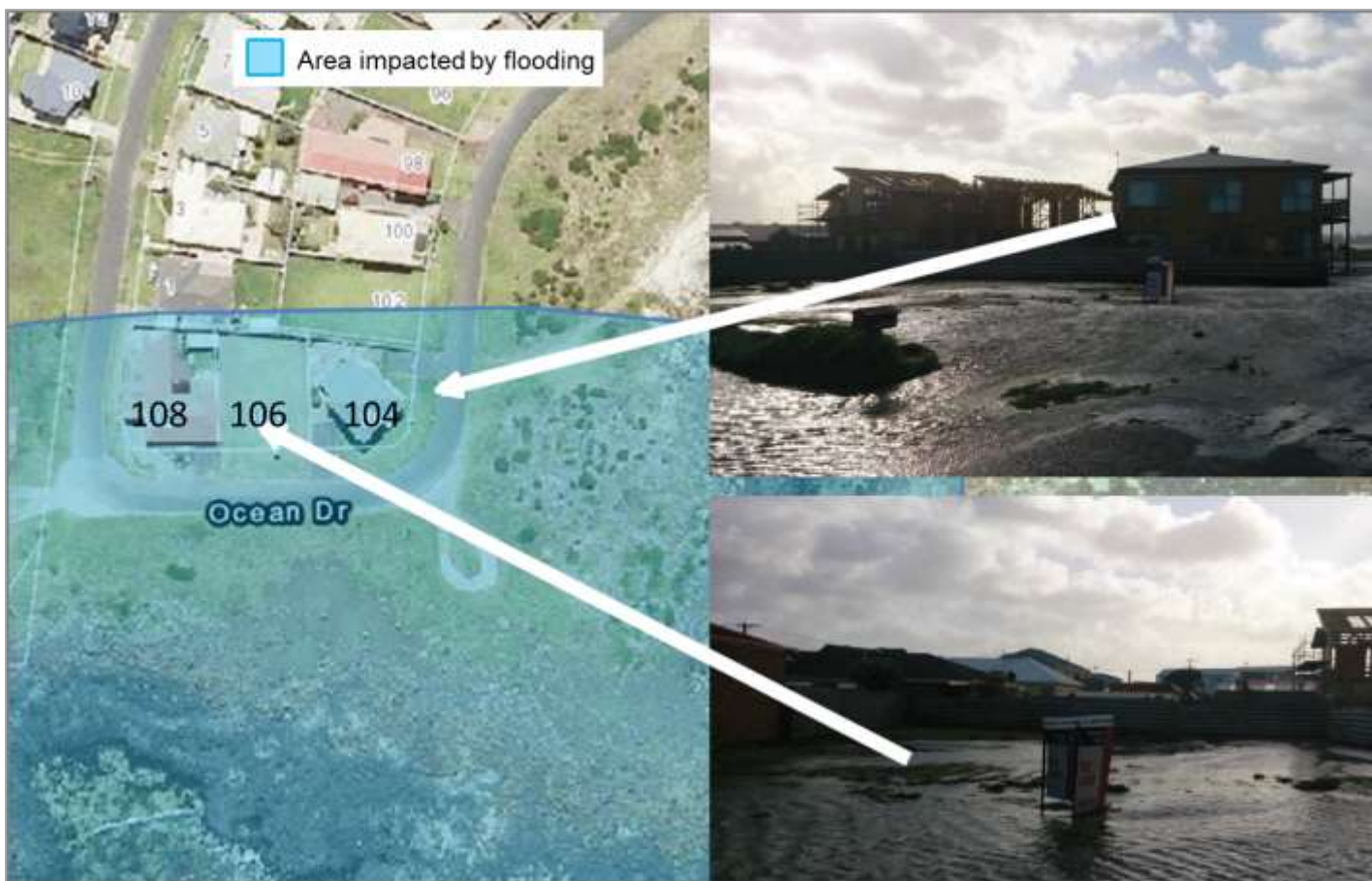


Figure 27. Storm surge flooding impacting properties along Ocean Drive impacted 2014 storm surge flood extent.

The Griffiths Island walkway connects Griffiths Island, located off Ocean Drive, adjacent to Martins Point Playground. Flooding of the Griffiths Island walkway often occurs during storm surge and/or high tide events, causing significant risk to life. An example of the Island walkway flooding is shown in the sequence of photos below, taken during a storm surge event in May 2009. Moments after a group of people crossed the walkway a wave crashed over the causeway. The depth of water can be greater than 1m, and flood velocities can be greater than 1.5 m/s. Also refer to the map and photos below.



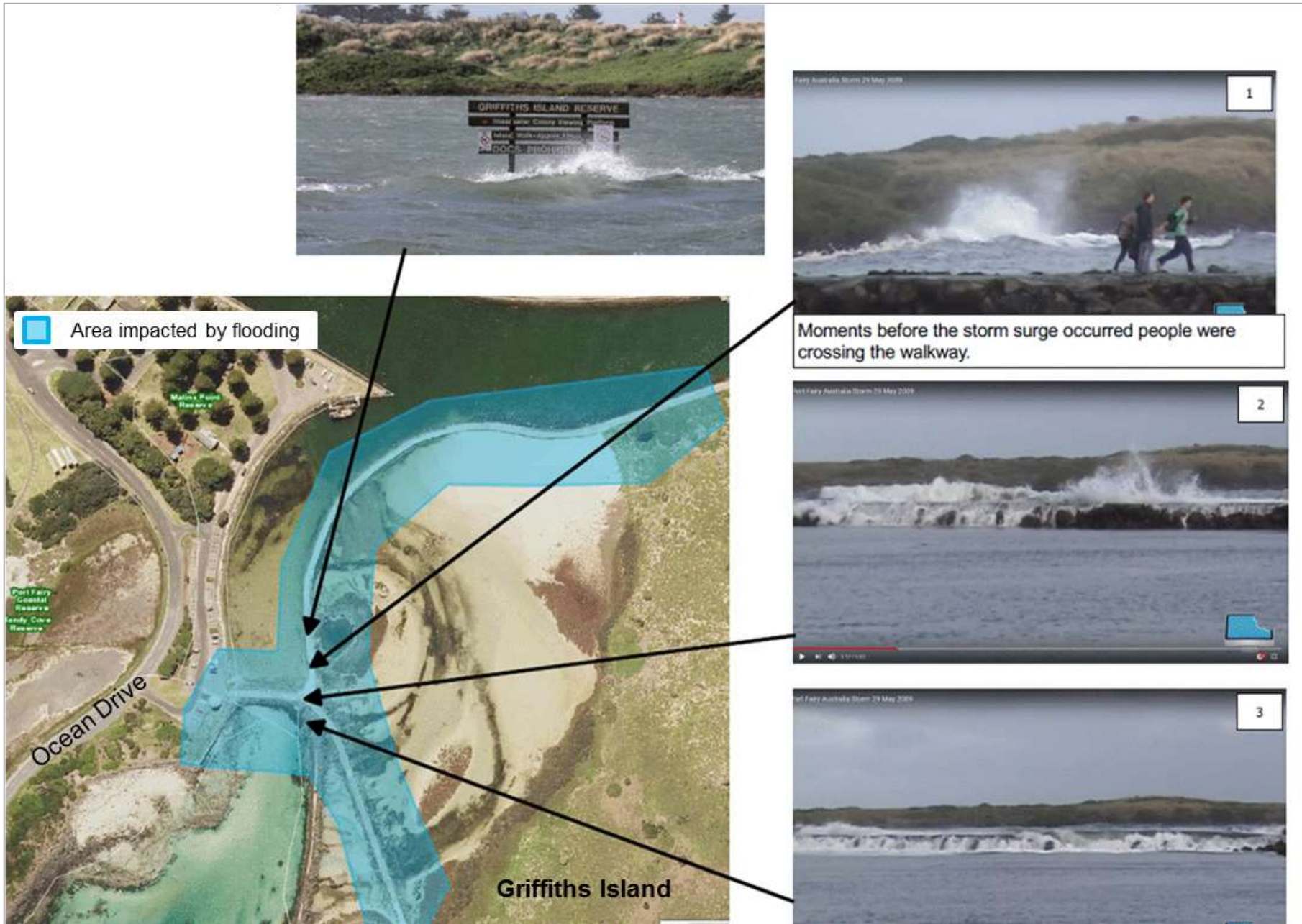


Figure 28. Flooding impacting the Griffiths Island walkway during a 2009 storm surge event.

Storm surge flooding cut access to Ocean Drive on the 24<sup>th</sup> of June 2014. The section of Ocean Drive impacted by localised flooding, between Martins Point Playground and Pea Soup. The force of waves crashing against the road pushed large rocks onto the road cutting access, refer to the photos below.



Figure 29. Storm surge flooding impacting Ocean Drive during the June 2014 event.

## Flood Impacts and Required Actions

Flood mapping from the Port Fairy Flood Study (Water Technology 2008) was used to estimate assets, buildings and roads impacted by flooding.

For additional flood risk information refer to the Port Fairy Flood Intelligence Card, table and maps below.

Key assets at risk of flooding in Port Fairy are listed below.

Table 6. Key assets at risk of flooding.

Asset register				
Asset Name and location	Annual Exceedance Probability (AEP)	Consequence / Impact	Mitigation/ Action	Lead Agency
Manifold Street Wannon Water Sewerage Pumping Station, 7 Manifold Street, Port Fairy.	5 year flood	Flooding starts to impact the Sewerage Pumping Station during a 5 year flood event.	Sandbagging Pumping Station as needed.	VICSES and Wannon Water
Daltons Road, Manifold Street and Deepwell Road, in and north of Port Fairy.	5 year flood	Deep flooding, above 0.3m depth cuts access to Daltons Road, Manifold Street and Deepwell Road during a 5 year flood event.	Deploy road closure signs as needed.	Council
Port Fairy Gardens Caravan Park, 111 Griffiths Street, Port Fairy.	10 year flood	Port Fairy Gardens Caravan Park is impacted by deep flooding during a 10 year flood event.	Evacuate the Caravan Park as needed.	Victoria Police
The first buildings to be flooded above floor include 161 Griffiths Street and buildings at the Gardens Caravan Park.	10 year flood	Several buildings are flooded above floor at 161 Griffiths Street and the Gardens Caravan Park during a 10 year flood event.	Sandbag buildings and undertake evacuations as needed	VICSES and Victoria Police
Gipps Street Bridge, Gipps Street, Port Fairy.	10 year flood	During high flood flows, large hay bales and other debris may build up against the Bridge and may compromise the structural integrity of the Bridge.	Organise a large arm excavator to be on stand-by to remove debris as needed.	VICSES
30 buildings along A bert Road, Port Fairy. Refer to the maps below for the area impacted.	100 year flood	Deep flooding may cut access to Albert Road, isolating over 30 houses.	Evacuate buildings isolated as needed.	Victoria Police
Pelican Waters Holiday Park (34 Regent Street), Port Fairy.	100 year flood	The Pelican Waters Holiday Park may be impacted by flooding during a 100 year flood event.	Evacuate the Caravan Park as needed.	Victoria Police
Sun Pharmaceuticals Processing Plant, 3 Sandpit Road, Port Fairy.	200 year flood	Deep flooding may impact a building at Sun Pharmaceuticals Processing Plant during a 200 year flood event. Chemical Storage	VICSES notify Sun Pharmaceuticals they need to move chemicals to high ground.	VICSES and Sun Pharmaceuticals
150 buildings surrounding Griffiths Street area, Port Fairy. Refer to the maps below for the area impacted.	200 year flood	Deep flooding may cut access to the Gipps Street Bridge. This may isolate over 150 buildings surrounding Griffiths Street.	Evacuate buildings isolated as needed.	Victoria Police
Big 4 Caravan Park (115 Princes Highway) and the Port Fairy Holiday Park (139 Princes Highway), Port Fairy.	200 year flood	The lower sections of the Big 4 Caravan Park and the Port Fairy Holiday Park may be impacted by deep flooding.	Evacuate the lower sections of the caravan parks as needed.	Victoria Police

For more detailed information regarding buildings and roads impacted refer to the Port Fairy Flood Intelligence Card and flood impact maps below. Also refer to the Port Fairy flood depth maps in **Appendix E**, a list of flood observers in **Appendix F** and community sandbag collection point in **Appendix I**.







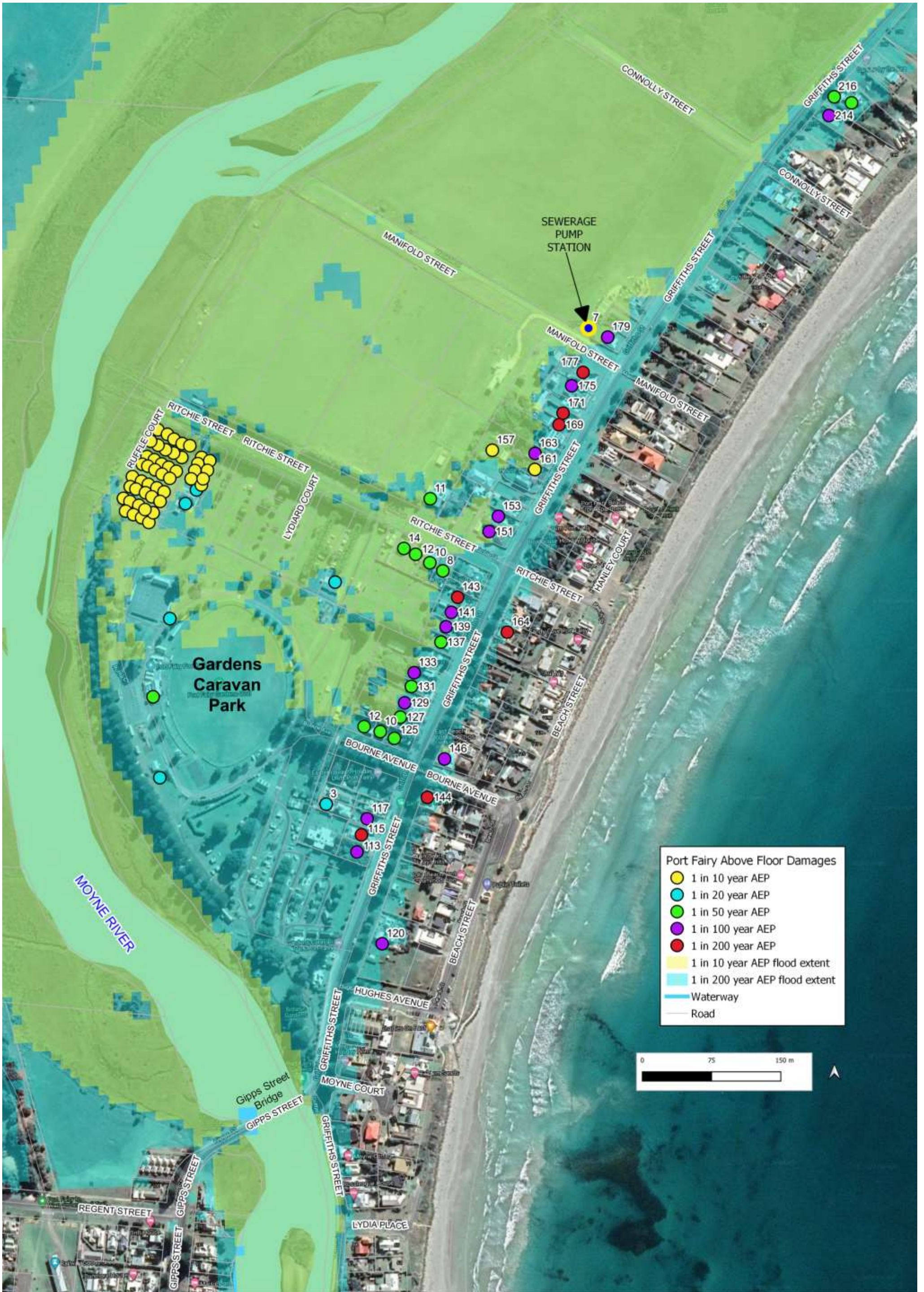


Figure 31. Port Fairy buildings impacted by over flood flooding for a range of design flood events (Water Technology 2008).



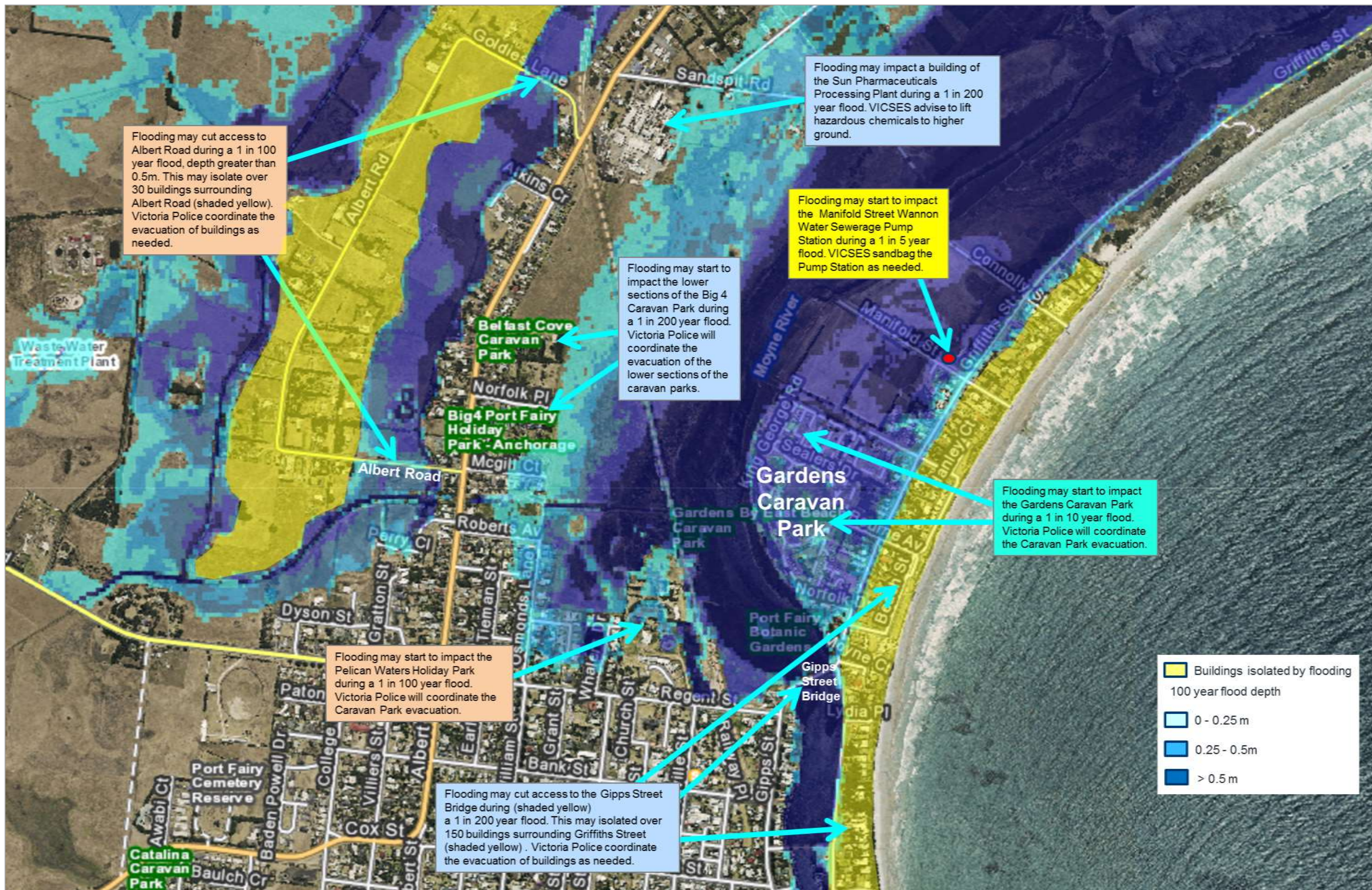


Figure 32. Port Fairy assets impacted by flooding for a range of design flood events (Water Technology 2008).



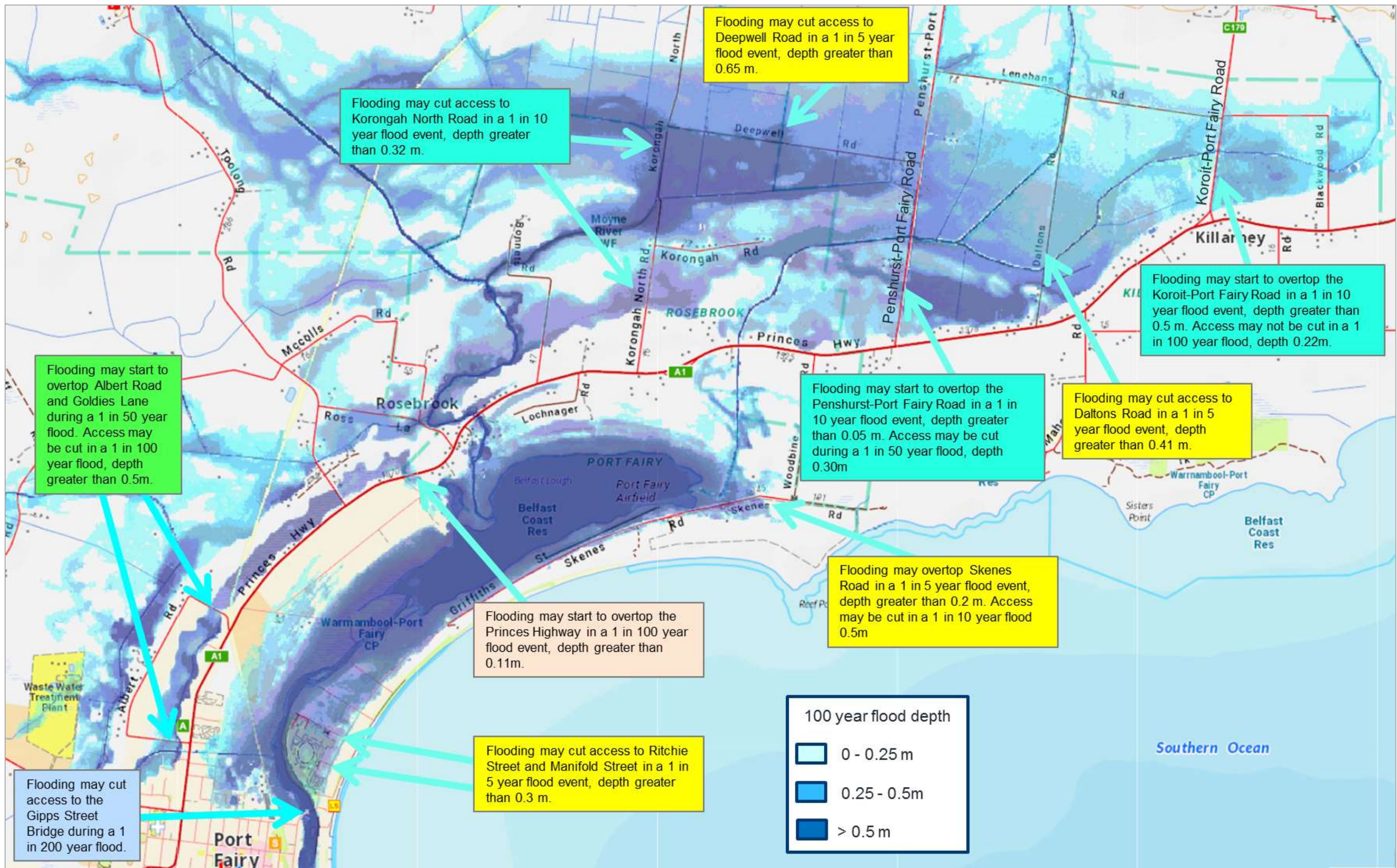


Figure 33. Port Fairy roads impacted by flooding for a range of design flood events (Water Technology 2008).



**Table 7. Port Fairy Flood Intelligence Card**

Flood travel time				Time from start of rain to steep rise in floodwater in Port Fairy 18 to 28 hours			
				Time from start of rain to peak at Toolong gauge 15 to 20 hours			
				Time from flood peak travel between the Toolong gauge to the Gipps Street Bridge 8 to 16 hours			
				Riverine flooding duration: 1 to 2 days			
Moyne River at Toolong gauge height 237200 (m)	Annual Exceedance Probability (1 in year)	Moyne River at Toolong Design Flows (ML/d)	Port Fairy damages total number properties flooded (above floor)	Consequences/ Impacts	Houses /buildings flooded / isolated	Roads impacted	Actions
		2,600-3,000		Flows begin breaking out of the river channel downstream from Toolong. These flows are stored in the Korongah Flats area. Heavy local rainfall may cause stormwater flooding along Campbell Street adjacent to the Southcombe Sports Complex (indoor swimming pool, indoor sports stadium), Russell Clark Reserve, Southcombe By the Sea Caravan Park, Ocean Drive, Reardon Street Reserve, Wetland Reserve, Elizabeth Street Reserve, Avery Street, Odowd Court and James Street.			
3.45	Proposed minor flood class level	4,343		Minor inundation of the Moyne River, Murray Brook, Reedy Creek and Belfast Lough areas. Low lying farmland and minor road crossings begin to be impacted by flooding.			VICSES to advise organisations that flood warnings have been issued. VICSES and council ensure sand and sand bags are available when needed. MERC, MERO and MRM to consider setting up MECC. Council monitor culverts and drains to check for debris build up, clear debris from waterway crossings, drains and culverts as needed.
3.72	September 2016 ~ 3 year event	5,100	0				
3.83	August 2001	5,459	0	Minor inundation of the Murray Brook, Reedy Creek and Belfast Lough areas. Inundation likely close to the property on the corner of Griffiths and Manifold Streets and along the edge of Skenes Road at the eastern-most end of Belfast Lough.			In addition to actions listed above; Prepare for distribution of 'water over road' signs to Richie Street, Manifold Street and Griffiths Street. Consider need to prevent backflow through the stormwater drainage system into the central part of town (south of Regent Street).
4.1	5	6,250	0	Flooding impacts the Manifold Street Wannan Water Sewerage Pump Station (7 Manifold Street), sandbagging may be required. Minor floodwater breaks out along Reedy Creek, Holcombe Drain and Murray Brook. Significant flooding north and south along the Moyne River downstream of/and adjacent to the Belfast Lough. Put out water over road signs for minor flooding. Water may be up to 250mm deep across parts of Richie Street and Manifold Street and up to the edge of Griffiths Street. The Port Fairy Airfield may be inundated by up to 500mm. Flooding from the Belfast Lough may impact Griffiths Street (north), Skenes Road, Manifold Street and Ritchie Street. Roads that may be impacted by flooding: Bonnets Road, Sandpit Road, Korongah North Road, Toolong Road, Ross Lane, Sharkeys Road, Lydiard Street, Skenes Road and Griffiths Street.	No buildings flooded above floor.	Manifold Street depth 0.32m Ritchie Street depth 0.40m Skenes Road depth 0.19m Bonnets Road depth 0m Princes Highway depth 0m Korongah North Road depth 0m Daltons Road depth 0.41m Deepwell Rd depth 0.65m Penshurst-Port Fairy Rd depth 0m Koroit-Port Fairy Rd depth 0m	In addition to actions listed above; Deploy water over road signs to close roads as needed. Consider evacuation of Richie Street, Manifold Street. VICSES sandbag the Manifold Street Sewerage Pumping Station (7 Manifold Street).
4.19	August 2010	7,307					
4.4	Proposed moderate flood class level 10 year event	9,015	167 (42)	Additional floodwater breaking out from the Moyne River may also impact a number of roads north of the Princes Highway. Flooding may cut access to Bonnet Road, Daltons Road, Deepwell Road, and Korongah North Road. Shallow flooding may overtop the Penshurst-Port Fairy Road and the Koroit-Port Fairy Road (north of Killamey). One house and one shed in Griffiths Street is flooded above floor. 32 buildings are flooded above floor at the Gardens Caravan Park (111 Griffiths Street).	32 buildings are flooded above floor, a dwelling 161 Griffiths Street, 32 buildings at the Gardens by East Beach Caravan Park, and a shed at 157 Griffiths Street.	Manifold Street depth 0.54m Ritchie Street depth 0.58m Skenes Road depth 0.50m Bonnets Road depth 0.35m Princes Highway depth 0m Korongah North Road depth 0.32m Daltons Road depth 0.58m Deepwell Rd depth 0.87m Penshurst-Port Fairy Rd depth 0.05m Koroit-Port Fairy Rd depth 0.05m	In addition to actions listed above; Victoria Police evacuate the Port Fairy Gardens Caravan Park (111 Griffiths Street) as needed. VICSES organise a long arm excavator to be available remove hay bales and other debris that may build up on the upstream side of the Gipps Street Bridge as needed, to ensure the structural integrity of the Bridge is not damaged.
4.5	1978 15 year event						

4.47	October 2020			<p>Flood peak at the Toolong gauge occurred on the 9<sup>th</sup> of October at 9:45pm. Flooding cut access to Deepwell Road, Bonnets Road, Ritchie Street, Manifold Street, Skenes Road, Korongah North Road, Daltons Road.</p> <p>Deep flooding at the Gardens Caravan Park, Port Fairy Airfield, Port Fairy Golf Club, 47 buildings were impacted above and below floor at the Gardens Caravan Park. 4 out of 16 buildings were impacted by above floor, these houses included 161 and 163 Griffiths Street. 12 buildings were impacted by flooding north of Port Fairy in the Kirkstall, Koroit, Crossley and Rosebrook area. Houses at 11 Deepwell Road (Crossley) and 5 Lydiard Street (Rosebrook) were at risk of above floor flooding. Flooding briefly overtopped the Penshurst-Port Fairy Road, access was not cut by flooding.</p> <p>Flooding impacted the Manifold Street (7 Manifold Street) and Catalina Caravan Park (513 Princes Highway) Wannon Water Sewerage Pump Stations, these stations were sandbagged.</p>	<p>Houses at risk of above floor flooding; 161 Griffiths Street, 163 Griffiths Street, 11 Deepwell Road Crossley, 5 Lydiard Street Rosebrook, 47 cabins and other buildings at the Gardens Caravan Park.</p> <p>Buildings at risk of below floor flooding may include;</p> <p><b>Koroit:</b> 1085 Tower Hill Rd, 34 Nine Mile Creek Road, 222 Penshurst-Warmambool Road (Koroit Pet Resort), 111 Penshurst-Warmambool Road, 170 Penshurst-Warmambool Road, 34 Nine Mile Creek Road.</p> <p><b>Kirkstall:</b> 90 Hamiltons Lane, 325 Spencer Road, 4 Cruites Road, 51 Atkinson Street, 73 Hickeys Road, 68 Aire Street and 515 Penshurst-Port Fairy Road, 50 Spencer Street, 45 Aire Street.</p> <p><b>Rosebrook:</b> 5 Lydiard Street, 5 Lydiard Street.</p> <p><b>Crossley:</b> 170 Penshurst-Port Fairy Road, 78 McCartney's Road.</p> <p><b>Killarney:</b> 21 Daltons Road, 1274 Princes Highway.</p>	<p>Road impacted by flooding, in addition to roads listed above:</p> <p><b>Warrong:</b> King Street (near the Warrong Fire Station).</p> <p><b>Koroit:</b> Duffus Street (deep water).</p> <p><b>Kirkstall:</b> Spencer Road, Spinks Road</p> <p><b>Hawkesdale:</b> roads north of Hawkesdale.</p>	
4.55	Proposed major flood class level						
4.6	20	12,241	200 (46)	<p>Flooding breaks out of Belfast Lough. Seven additional buildings are flooded above floor.</p>	<p>One additional garage at 2/3 Castwood Place (adjacent to the Gardens Caravan Park) and additional buildings at Gardens Caravan Park are flooded above floor.</p>	<p>Manifold Street depth 0.70m Ritchie Street depth 0.74m Skenes Road depth 0.88m Bonnets Road depth 0.65m Princes Highway depth 0m Korongah North Road depth 0.87m Daltons Road depth 0.74m Deepwell Rd depth 1.13m Penshurst-Port Fairy Rd depth 0.11m Koroit-Port Fairy Rd depth 0.10m</p>	<p>In addition to actions listed above; VICSES sandbag buildings as needed. VICSES and Council set up a community sandbag Collection Point (at the car park next to the Port Fairy Surf Lifesaving Club, 4 Hughes Ave)</p>
4.9	50	17,457	261 (61)	<p>Six additional buildings are flooded above floor in Ritchie Street, Bourne Avenue and Griffiths Street.</p>	<p>6 additional dwellings flooded above floor: x5 in Ritchie Street (8, 10, 11, 12, 14), 10 and 12 Bourne Avenue, and x6 in Griffiths Street (125, 127, 131, 137, 216). The majority of these buildings are holiday houses. Access to 30 Sandpit Road is likely to be impacted.</p>	<p>Manifold Street depth 1.03m Ritchie Street depth 1.03m Skenes Road depth 1.20m Bonnets Road depth 0.87m Princes Highway depth 0m Korongah North Road depth 0.92m Daltons Road depth 0.78m Deepwell Rd depth 1.21m Penshurst-Port Fairy Rd depth 0.28m Koroit-Port Fairy Rd depth 0.15m</p>	<p>Refer to actions listed above.</p>
5.1	100	22,323	343 (78)	<p>Significantly more flooding in Griffith Street. Overland flows from Reedy Creek occur from just east of Princes Highway. Flooding overtops Sandpit Road and Model Street. Deep floodwater may cut access to Albert Road and Goldies Lane, this may isolate over 30 buildings for approximately 12 to 24 hours. Flooding may have minor impacts to land adjacent to the Sun Pharmaceuticals Processing Plant (3 Sandpit Road). Minor flooding impact on low lying land at the Big 4 Caravan Park (115 Princes Highway). Deep flooding may impact the Pelican Waters Holiday Park (34 Regent Street), evacuate the caravan park as needed.</p>	<p>17 additional dwellings flooded above floor: 14 in Griffiths Street (113, 117, 120, 129, 133, 139, 141, 146, 151, 153, 163, 175, 179, 214), 7 Whalers Drive, 11 Uebergang Street and 2 Tieman Street. Access cut to the Albert Road will isolate over 30 buildings surrounding Albert Road.</p>	<p>Manifold Street depth 1.37m Ritchie Street depth 1.42m Skenes Road depth 1.54m Bonnets Road depth 1.03m Princes Highway depth 0.11m Korongah North Road depth 1.17m Daltons Road depth 0.87m Deepwell Rd depth 1.47m Penshurst-Port Fairy Rd depth 0.45m Koroit-Port Fairy Rd depth 0.22m</p>	<p>In addition to actions listed above; Victoria Police evacuate Pelican Waters Holiday Park (34 Regent Street) as needed. Victoria Police evacuate 30 buildings isolated by flooding along Albert Road as needed.</p>
5.2	200	28,181	451 (108)	<p>Deep flooding may cut access to the Gipps Street Bridge, this will isolate over 150 buildings for approximately 12 to 24 hours. Additional houses may be flooded in Griffiths Street, Gipps Street, Sandpit Road, Uebergang Street, Tieman Street, Roberts Avenue, Model Lane and Osmonds Lane. 32 additional buildings are flooded above floor. Deeper flooding at both the Big 4 Caravan Park (115 Princes Highway) and the Port Fairy Holiday Park (139 Princes Highway), impacting lower sections of the caravan parks may need to be evacuated. Deeper flooding may impact a building at the Sun Pharmaceuticals Processing Plant (3 Sandpit Road). Consider advising Sun Pharmaceuticals to move hazardous chemicals to higher ground as needed.</p>	<p>32 additional dwellings flooded above floor: 14 in Griffiths Street (3, units 1 &amp; 2/24, 26, 32, 74, 115, 143, 144, 164, 167, 171, 173, 177), 30 Sandpit Road, x9 Gipps Street (9, 13, 17, 23, 37 - 39, 41B, 49), 9 Uebergang Street, 4 Tieman Street, x3 Roberts Avenue (14, 16, 18), 143 Model Lane and 11 Osmonds Lane. Access cut to the Gipps Street Bridge will isolate over 150 buildings surrounding Griffiths Street.</p>		<p>In addition to actions listed above; Victoria Police evacuate 150 buildings isolated by flooding along Griffiths Street due to access being cut at the Gipps Street Bridge. Victoria Police evacuate the lower sections of the Big 4 Caravan Park (115 Princes Highway) and the Port Fairy Holiday Park (139 Princes Highway) as needed. VICSES request Sun Pharmaceuticals to move any hazardous chemicals to higher ground as needed.</p>
5.7	1946 1,000 year event			<p>The largest flood on record. Rosebrook Bridge was washed away before the flood peak arrived. Flooding from the Moyne River outflanked the Gipps Street Bridge. The Princes Highway was overtopped by the Moyne River west of Rosebrook Bridge.</p>			



**Table 8. Port Fairy Property Inundation Table (Water Technology 2008)**

Colours used in the table below are the same used in the Port Fairy flood risk maps above. Yellow, buildings flooded above floor in a 1 in 10 year AEP. Blue, buildings flooded above floor in a 1 in 20 year AEP flood event, etc.

No	Address	Depth of building over floor flooding for each AEP (1 in year) event (m)					Type of building
		10	20	50	100	200	
1	157 GRIFFITHS STREET PORT FAIRY	0.58	0.81	1.16	1.47	1.87	Shed (house not impacted)
2	161 GRIFFITHS STREET PORT FAIRY	0.07	0.3	0.65	0.96	1.35	Dwelling
3	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
4	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
5	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
6	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
7	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
1	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
2	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
3	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
4	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
5	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
6	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
7	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
8	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
9	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
10	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
11	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
12	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
13	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
14	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
15	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
16	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
17	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
18	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
19	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
20	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
21	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
22	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
23	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court

No	Address	Depth of building over floor flooding for each AEP (1 in year) event (m)					Type of building
		10	20	50	100	200	
24	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
25	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
26	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
27	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
28	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
29	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
30	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
31	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
32	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
33	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
34	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
35	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
36	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
37	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
38	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
39	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
40	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
41	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
42	GARDENS CARAVAN PARK PORT FAIRY	0.05	0.3	0.68	1.01	1.42	Floor level of cabins at Ruffle Court
43	GARDENS CARAVAN PARK PORT FAIRY		0.12	0.46	0.79	1.18	Easternmost building
44	GARDENS CARAVAN PARK PORT FAIRY		0.11	0.44	0.77	1.18	Home change rooms
45	GARDENS CARAVAN PARK PORT FAIRY		0.08	0.42	0.76	1.15	Large building on Rutledge Ct
46	2/3 CASTWOOD PLACE PORT FAIRY		0.07	0.39	0.72	1.13	Dwelling
47	216 GRIFFITHS STREET PORT FAIRY			0.43	2.37	1.11	Garage
48	12A OSMONDS LANE PORT FAIRY			0.31	0.67	1.09	Possible Dwelling
49	14 RITCHIE STREET PORT FAIRY			0.32	0.65	1.06	Dwelling
50	GARDENS CARAVAN PARK PORT FAIRY			0.32	0.65	1.06	Grandstand
51	216 GRIFFITHS STREET PORT FAIRY			0.31	0.62	1.00	Dwelling
52	137 GRIFFITHS STREET PORT FAIRY			0.29	0.62	1.02	Dwelling
53	12 RITCHIE STREET PORT FAIRY			0.23	0.56	0.96	Dwelling
54	127 GRIFFITHS STREET PORT FAIRY			0.21	0.54	0.94	Dwelling
55	10 BOURNE AVENUE PORT FAIRY			0.2	0.53	0.93	Dwelling
56	12 BOURNE AVENUE PORT FAIRY			0.2	0.53	0.93	Dwelling
57	8 RITCHIE STREET PORT FAIRY			0.18	0.51	0.91	Dwelling

No	Address	Depth of building over floor flooding for each AEP (1 in year) event (m)					Type of building
		10	20	50	100	200	
58	131 GRIFFITHS STREET PORT FAIRY			0.09	0.42	0.82	Dwelling
59	10 RITCHIE STREET PORT FAIRY			0.05	0.38	0.78	Dwelling
60	125 GRIFFITHS STREET PORT FAIRY			0.01	0.34	0.74	Dwelling
61	11 RITCHIE STREET PORT FAIRY			0.01	0.33	0.71	Dwelling
62	151 GRIFFITHS STREET PORT FAIRY				0.32	0.72	Dwelling
63	175 GRIFFITHS STREET PORT FAIRY				0.29	0.67	Dwelling
64	139 GRIFFITHS STREET PORT FAIRY				0.28	0.68	Dwelling
65	2 TIEMAN STREET PORT FAIRY				0.26	0.68	Dwelling
66	113 GRIFFITHS STREET PORT FAIRY				0.26	0.67	Dwelling
67	120 GRIFFITHS STREET PORT FAIRY				0.22	0.63	Dwelling
68	214 GRIFFITHS STREET PORT FAIRY				0.21	0.58	Dwelling
69	153 GRIFFITHS STREET PORT FAIRY				0.20	0.60	Dwelling
70	133 GRIFFITHS STREET PORT FAIRY				0.18	0.58	Dwelling
71	179 GRIFFITHS STREET PORT FAIRY				0.18	0.54	Dwelling
72	129 GRIFFITHS STREET PORT FAIRY				0.10	0.51	Dwelling
73	141 GRIFFITHS STREET PORT FAIRY				0.10	0.49	Dwelling
74	163 GRIFFITHS STREET PORT FAIRY				0.07	0.46	Dwelling
75	146 GRIFFITHS STREET PORT FAIRY				0.04	0.44	Dwelling
76	117 GRIFFITHS STREET PORT FAIRY				0.03	0.70	Dwelling
77	7 WHALERS DRIVE PORT FAIRY				0.02	0.44	Dwelling
78	11 UEBERGANG STREET PORT FAIRY				0.01	0.43	Dwelling
79	Gardens by East Beach Caravan Park					0.10	Dwelling
80	167 GRIFFITHS STREET PORT FAIRY					0.90	Gardens by East Beach Caravan Park
81	17 GIPPS STREET PORT FAIRY					0.42	Dwelling
82	26 GRIFFITHS STREET PORT FAIRY					0.41	Dwelling
83	173 GRIFFITHS STREET PORT FAIRY					0.36	Dwelling
84	49 GIPPS STREET PORT FAIRY 3284 (Front)					0.32	Dwelling
85	144 GRIFFITHS STREET PORT FAIRY					0.33	Dwelling not affected. Outbuilding (South)
86	74 GRIFFITHS STREET PORT FAIRY					0.29	Dwelling
87	32 GRIFFITHS STREET PORT FAIRY					0.24	Outbuilding at front of property
88	9 UEBERGANG STREET PORT FAIRY					0.22	Dwelling
89	18 ROBERTS AVENUE PORT FAIRY					0.21	Dwelling
90	115 GRIFFITHS STREET PORT FAIRY					0.18	Dwelling
91	16 ROBERTS AVENUE PORT FAIRY					0.18	Dwelling



No	Address	Depth of building over floor flooding for each AEP (1 in year) event (m)					Type of building
		10	20	50	100	200	
92	23 GIPPS STREET PORT FAIRY					0.17	Dwelling
93	14 ROBERTS AVENUE PORT FAIRY					0.17	Dwelling
94	177 GRIFFITHS STREET PORT FAIRY					0.15	Dwelling
95	143 MODEL LANE PORT FAIRY					0.15	Dwelling
96	9 GIPPS STREET PORT FAIRY					0.14	Dwelling
97	4 TIEMAN STREET PORT FAIRY					0.14	Dwelling
98	11 OSMONDS LANE PORT FAIRY					0.12	Dwelling
99	3 GRIFFITHS STREET PORT FAIRY					0.09	Dwelling
100	1/24 GRIFFITHS STREET PORT FAIRY					0.07	Moyne river reserve, public assets possibly affected. Already listed above
101	2/24 GRIFFITHS STREET PORT FAIRY					0.07	Dwelling
102	164 GRIFFITHS STREET PORT FAIRY					0.05	Dwelling
103	171 GRIFFITHS STREET PORT FAIRY					0.05	Dwelling
104	143 GRIFFITHS STREET PORT FAIRY					0.03	Dwelling
105	37-39 GIPPS STREET PORT FAIRY					0.02	Rear Building
106	169 GRIFFITHS STREET PORT FAIRY					0.01	Dwelling
107	30 SANDSPIT ROAD PORT FAIRY					0.02	Dwelling
108	13 GIPPS STREET PORT FAIRY					>.01	Dwelling

**ATTACHMENT 5 - LOCAL FLOODPLAIN DEVELOPMENT PLAN (PART A VERSION)**