

Chetwynd Flood Intelligence and Flood Mapping Amendment C38wwim Mapping Report

June 2025

Author of report

Glenelg Hopkins Catchment Management Authority

How to reference this report

Chetwynd Flood Intelligence and Flood Mapping Amendment C38wwim Mapping Report (Glenelg Hopkins Catchment Management Authority, 2025).

Overview

This report will provide an explanation of the flood mapping used for the Chetwynd C38wwim Amendment.

Name of original flood study

Chetwynd Flood Intelligence and Flood Mapping (Water Technology Pty Ltd, June 2018)

Does the draft amendment mapping reflect ‘best available data’?

The Glenelg Hopkins Catchment Management Authority considers that the amendment mapping represents the best available data complying with the Victorian Planning Provisions Clause 13.01-1S.

Does the draft amendment mapping factor in climate change?

The Chetwynd Flood Intelligence and Flood Mapping (Water Technology Pty Ltd, June 2018) did not include the effects of climate change on flood behaviour. To align the draft amendment mapping with the objective of the Victorian Planning Provisions Clause 13.01-1S, the 0.5 per cent Annual Exceedance Probability event has been selected as the best representation of a climate change adjusted future 1 per cent Annual Exceedance Probability event utilising the [WMA Climate Change Calculator tool](#) in line with the Australian Rainfall and Runoff, Version 4.2.

Does the Catchment Management Authority or council have local policy on which emission scenario and time horizon to use?

Glenelg Hopkins Catchment Management Authority adopts the Shared Socioeconomic Pathway 5-8.5 to a planning horizon of 2100 when considering flood risk management and strategic planning. The planning horizon of 2100 complies with Coastal inundation and erosion strategies of the Victorian Planning Provisions

Clause 13.01-2S, and as Glenelg Hopkins Catchment Management Authority is a coastal Catchment Management Authority the 2100 planning horizon has been adopted throughout the catchment for riverine and coastal flooding. The Shared Socioeconomic Pathway 5-8.5 is used to ensure that planning decisions are made to protect the community under a wide range of possible climate change outcomes and their impacts on flood risk. Adoption of the Shared Socioeconomic Pathway 5-8.5 provides for responsible flood risk management and planning outcomes that are sustainable to the 2100 planning horizon.

Explain the methodology used to update an original flood study to factor in climate change?

The draft amendment mapping has been prepared by the Glenelg Hopkins Catchment Management Authority, 2025. For flood investigations and intelligence prepared prior to the Australian Rainfall and Runoff Version 4.2 update, Glenelg Hopkins Catchment Management Authority utilises the [WMA Climate Change Calculator tool](#) to determine a projected 1 per cent Annual Exceedance Probability event for 2100. It should be noted that a limitation of the WMA Climate Change Calculator tool is that it provides an estimated 1 per cent Annual Exceedance Probability event for 2090 as its maximum planning horizon, however Glenelg Hopkins Catchment Management Authority considers this a suitable proxy time horizon in the absence of flood information for 2100.

The draft amendment mapping factors in climate change using the following required inputs into the WMA Climate Change Calculator tool:

- Snap approach
- Initial Loss (mm) - 11
- Continuing Loss (mm/hr) - 2
- Critical Duration (hr) – 12
- Urbanisation (%) – 0
- Guideline – ARR V4.2 IFD and loss adjustment
- 1 per cent Annual Exceedance Probability
- Time Horizon – 2090
- Emission scenario - Shared Socioeconomic Pathway 5-8.5

The WMA Climate Change Calculator tool projects that a future 1 per cent Annual Exceedance Probability flood event under the Shared Socioeconomic Pathway 5-8.5 for the year 2090 is equivalent to a 1 in 348.1 Annual Exceedance Probability historical event for Chetywnd. In Annual Exceedance Probability per centages this is between a 0.5 and 0.2 per cent event. The Chetwynd Flood Intelligence and Flood Mapping produced modelling for a 0.5 per cent Annual Exceedance Probability event, and as this is the largest modelled event and closest available modelling to the projected event, this event has been adopted as a suitable climate change scenario for the purpose of this amendment.

Has the draft amendment mapping undergone any other spatial changes from the raw flood modelling data found in the original study?

The raw Chetwynd flood modelling has been processed to produce the draft amendment mapping. A high hazard map extent was extracted using the following criteria from the 0.5 per cent Annual Exceedance Probability mapping produced by the Chetwynd Flood Intelligence and Flood Mapping (Water Technology Pty Ltd, 2018):

- Depth equal to or greater than 0.5 metres and,
- Velocity equal to or greater than 2 metres per second and,
- Depth x Velocity product equal to or greater than 0.4 metres squared per second.

Both the 0.5 per cent Annual Exceedance Probability flood extent and the high hazard flood extent were smoothed through an automated GIS process and areas known as flood islands, which are areas fully surrounded by floodwaters, were filled in through an automated GIS process.

Within the Township Zone and Rural Living Zone to the north of Chetwynd (Mooree Road), the overlay applied was dependent on the level of flood hazard:

- The Floodway Overlay was applied within the high hazard flood extent
- The Land Subject to Inundation Overlay was applied to the remainder of the floodplain outside of the high hazard flood extent.

The Floodway Overlay was applied to the remainder of the 0.5 per cent Annual Exceedance Probability flood extent outside of the areas previously mentioned. The decision to apply the Floodway Overlay to the remainder of the flood extent outside of the areas listed above was based on a desktop assessment undertaken between Glenelg Hopkins Catchment Management Authority and West Wimmera Shire where it was noted that all properties within the 0.5 per cent Annual Exceedance Probability flood extent were either entirely within the high hazard flood extent or had sufficient land available that any future development could be located entirely outside of the 0.5 per cent Annual Exceedance Probability flood extent. This includes the Rural Living Zone to the south of Chetwynd (Casterton-Edenhope Road).

Minor adjustments to the mapping have been made to remove overlays from property boundaries where the area impacted is less than 30 metres squared. See Image 1 for an example of manual adjustments.

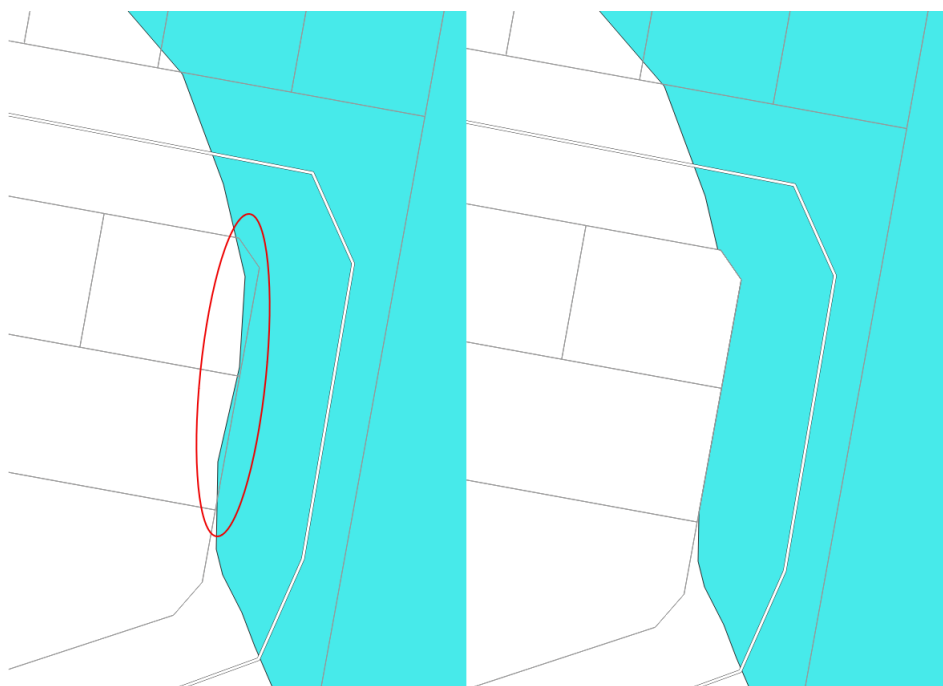


Figure 1 – Left: Properties impacted by amendment mapping based on flood mapping. Right: After manual adjustments have been applied to flood mapping.

Conclusion

The draft amendment mapping represents the best available flood information for a future 1 per cent Annual Exceedance Probability by 2090 under the Shared Socioeconomic Pathway 5-8.5 using outputs from the Chetwynd Flood Intelligence and Flood Mapping (Water Technology Pty Ltd, 2018).