Goulburn Mulwaree Council

Flood Impact and Risk Assessment (FIRA)- Planning Proposal to rezone 158 Gorman Road, Goulburn

REZ_0003_2324

(PP-2023-2264)

March 2025

Exhibition Version

Prepared by Goulburn Mulwaree Council

Version Table		
Version Number	**Date**	**Amendment Type**
1	16th May 2024	Gateway
2	3 March 2025	Exhibition

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1. Executive Summary

This Flood Impact and Risk Assessment (FIRA) has been prepared alongside a Planning Proposal at 158 Gorman Road Goulburn, which will result in the creation of one (1) additional lot, therefore being of minor significance.

Flood information, including depths and velocities during overland flood events, have been considered within the part of the lot subject of this Planning Proposal and the evacuation routes, for the 1%, 0.05% and PMF events. The more frequent 5% flood event has also been considered against hazard categories contained within the general flood hazard vulnerability curve (Australian Emergency Handbook 7).

It is noted that the site is not subject to any riverine flooding.

The information indicates that up to and including the PMF, safe access can be facilitated into and out of the site within the lowest Hazard Classification (i.e. H1). For the rest of Gorman Road along the evacuation route, particularly at the frontage of 14 Gorman Road, the deepest point of inundation is 0.47cms during a PMF event and this depth (considering velocity data) facilitates safe access by a large vehicle.

The flood risk for evacuation is low.

Given the relative elevation of the area, flooding is classified as overland flooding and likely characterised as flash flooding. Therefore, isolation times will be of relatively short duration. Information in relation to duration and warning times will be provided if required to further demonstrate suitability and low flood risk.

2. Introduction

This Flood Impact and Risk Assessment (FIRA) has been prepared in accordance with the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) publication, *Flood Impact and Risk Assessment – Flood Risk Management Guideline LU01*, 2023. This FIRA should be read in conjunction with the Planning Proposal PP-2023-2264 for 158 Gorman Road Goulburn and supporting documentation.

This FIRA is a "simple" assessment in accordance with Section 2.8 of the Guidelines as it is being prepared at a preliminary stage of a larger development to assist in informing future planning noting that a development application will also need to be prepared and submitted.

The preparation of this preliminary FIRA has also considered the following guidelines from the *Flood Risk Management Toolkit*:

- *EM01- Support for Emergency Management Planning*
- *FB01- Understanding and Managing Flood Risk*
- *MM01- Flood Risk Management Measures*

3. Need for a flood impact risk assessment.

This planning proposal seeks to rezone an area of approximately 4.7 hectares of rural land situated to the east of Goulburn, within the Gorman Road precinct of the *Urban and Fringe Housing Strategy*. A site location plan is illustrated in **Figure 1.**

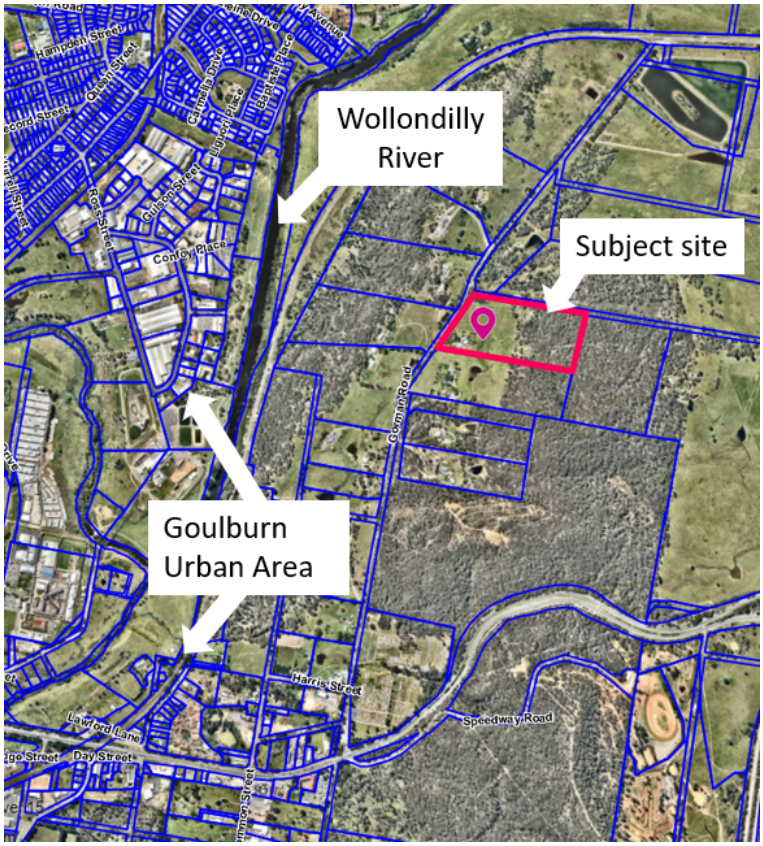


Figure 1: *Site location plan*

It is noted that the Planning Proposal is specifically to re-zone the western portion of 158 Gorman Road and to slightly relocate the zone boundary between the existing RU6 and C3 zoned land.

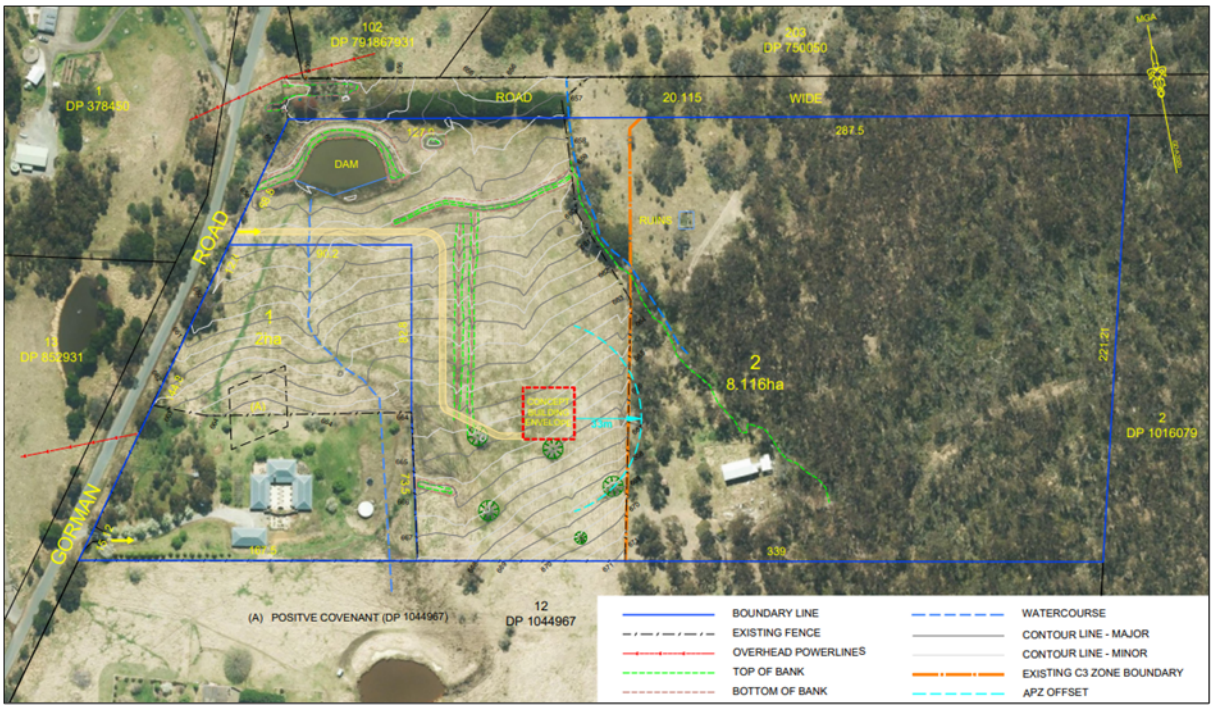
The subject site comprises one existing lot (Lot 11 DP 1044967) accessed via Gorman Road. The western half of the site is mostly cleared land and the eastern half is heavily vegetated. A dwelling house and ancillary development are located on the land, along with outbuildings formerly used for agricultural purposes, and one (1) dam.

The planning proposal is proponent led and seeks to rezone part of the site to R5 Large Lot Residential, as identified within Council's *Urban and Fringe Housing Strategy*.

The rezoning is to facilitate a future urban residential subdivision, the site having the capacity for one (1) additional large lot residential lot. Portions of the site are affected by water courses and overland flood prone land and it is considered that any adverse impacts can be overcome without the need to re-zone these parts of the land to restrict future development.

The proposal also seeks to amend the minimum lot size from 10 hectares to 2 hectares for the R5 Large Lot Residential area proposed. A copy of the submitted Planning Proposal document is available to view in **Appendix 1**.

The proponent's concept subdivision plan identifies a two (2) lot subdivision where each lot will have independent access from Gorman Road. The proponent's concept subdivision plan is presented in Figure 2 and **Appendix 2**.



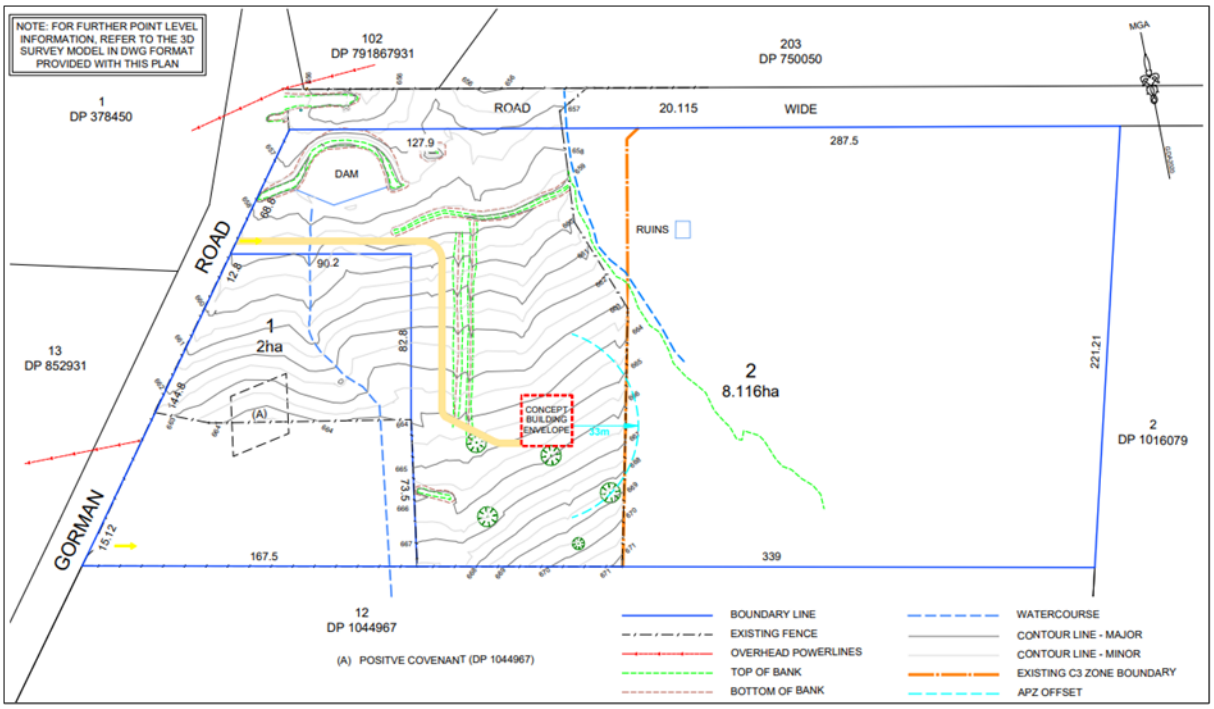


Figure 2: *Proponent's Concept Subdivision Plan*

The land is burdened by non-perennial watercourses.

The site is located just east of the existing urban fringe and approximately 650 metres east of the Wollondilly River. **Figure 3** below shows the location of each non-perennial watercourse and the Wollondilly River relative to the site.

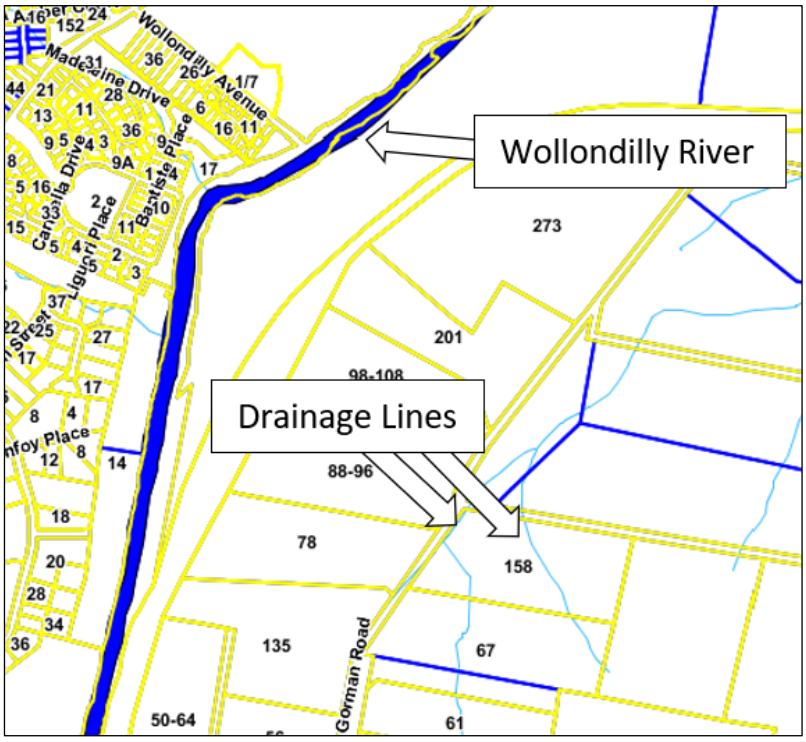


Figure 3*: Location of Drainage Channels*

Prior to any mitigations identified in this FIRA it is considered that the site would be classified as a rising road using the flood emergency response classifications in EM01 as per the **Figure**

4 below. Portions of the site are currently flood affected, and evacuation is currently possible via overland flow paths. The site adjoins the urban fringe and is adjacent to services located east of the Goulburn Commercial Business District (CBD), and has easy access to the Hume Highway.

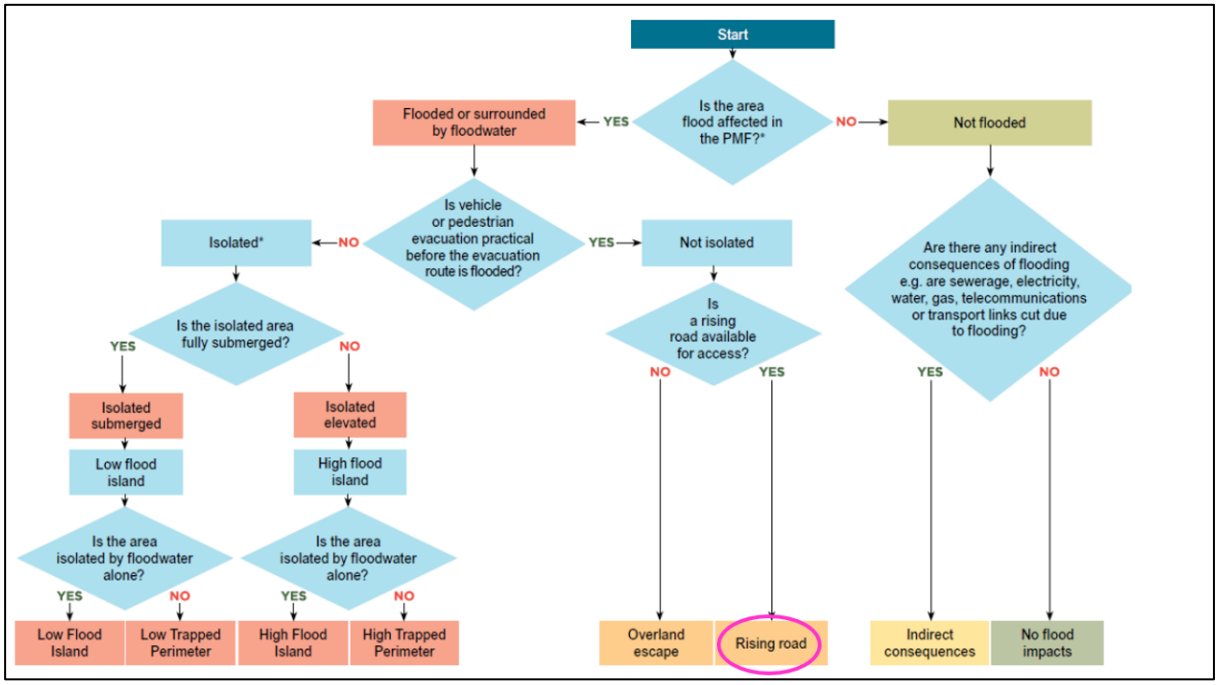


Figure 4: *Flood Emergency Response Classifications – Prior to Mitigations*

4. Consultation

Council has undertaken consultation in general terms in relation to flood impact and risk in Goulburn and the approach required when considering planning proposals for rezoning rural land on the town's periphery to residential. Council held two Goulburn Flooding Technical Working Group meetings between Council, State Emergency Service (SES) and NSW DPE staff in October – November 2023 with representatives from NSW SES, NSW DPE (Planning) and NSW DPE (Biodiversity Conservation Division- Flooding). These meetings focused on planning proposals south of the Hume Highway and on the Goulburn central business district (CBD). It should be noted that the overall approach of all agencies towards rezoning land which may be directly or indirectly affected by flooding has informed this FIRA.

Consultation has been undertaken with DCCEEW and the SES during the State agency consultation process associated with the planning proposal.

The FIRA has been further informed by warning duration data.

5. Available Flood Studies and Existing Assessment Requirements

The Goulburn Floodplain Risk Management Study and Plan (The Flood Study) was adopted by Council on 16 August 2022 and was developed in collaboration with the former Department of Planning and Environment- Environment, Energy and Science. The Flood Study was prepared by GRC Hydro in accordance with and consistent with:

- The NSW Flood Prone Land Policy;

- The principles of the Floodplain Development Manual 2005, and
- Considering flooding in land use planning guideline 2021.

The study area includes the subject site but only models the extent of riverine and major tributary flooding. This site is not identified as being subject to riverine flooding for any design event. Riverine flooding from the Wollondilly River does restrict access to the central Goulburn from this precinct during a Probable Maximum Flood (PMF). Access to the Hume Highway is still available during the PMF event.

The Flood Study also included a Development Control Policy which applies controls to both flood prone land within the Flood Study boundaries and areas outside the scope of the Study.

The Flood Study and *Goulburn Mulwaree Development Control Plan 2009 (GM DCP 2009)* flood policy implements Flood Planning Constraint Categories (FPCC) which groups similar types and scales of flood related constraints. Four FPCC's have been established to separate areas of the floodplain from the most constrained and least suitable areas for intensification of land use. The FPCC's are presented in **Figure 5** and **Figure 6** below:

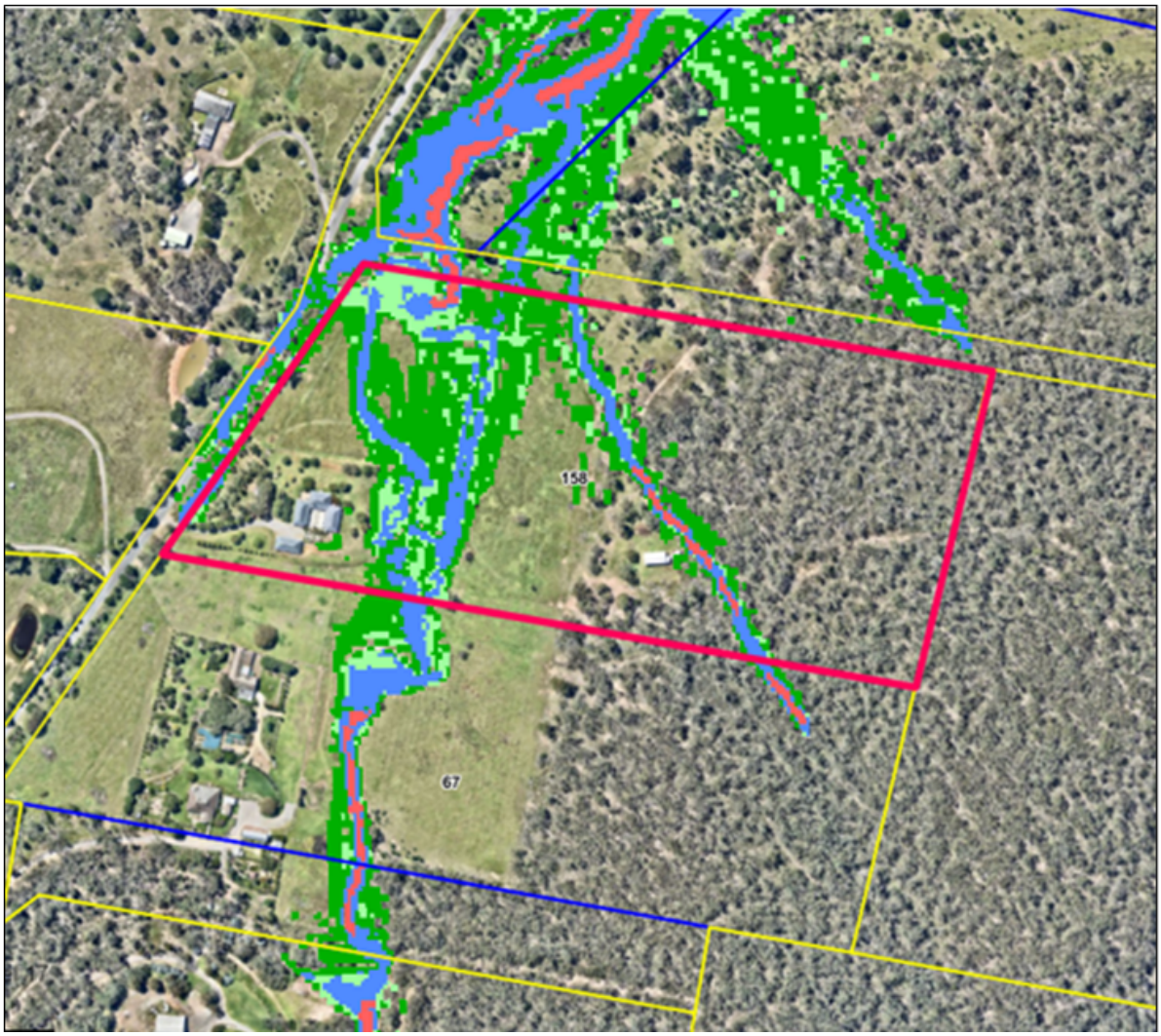


***Figure 5**: Extent of Flood Prone Land – Overland Flooding Modelling Using FPCC (source: Goulburn Overland Flow Modelling Final Report, GRC Hydro, January 2021)*

Category	Summary
FPCC1	FPCC1 identifies the most significantly constrained areas, with high hazard or significant flood flows present. Intensification of use in FPCC1 is generally very limited except where uses are compatible with flood function and hazard.
FPCC2	FPCC2 areas are the next least suitable for intensification of land use or development because of the effects of flooding on the land, and the consequences to any development and its users.
FPCC3	FPCC3 areas are suitable for most types of development. This is the area of the floodplain where more traditional flood-related development constraints, based on minimum floor and minimum fill levels, will apply.
FPCC4	FPCC4 is the area inundated by the PMF (extent of flood prone land) but outside FPCC1-3. Few flood-related development constraints would be applicable in this area for most development types. Constraints may apply to key community facilities and developments where there are significant consequences to the community if failed evacuations occur.

***Figure 6**: Flood Planning Constraint Categories (FPCC)*

The *GM DCP 2009* flood policy applies different flood planning controls depending on the proposed land use category to ensure that new development does not increase flood risk.

Council has initiated the preparation of the *Goulburn Overland Flooding Risk Study and Management Plan* for Goulburn following a successful funding application through the NSW Department of Planning and Environment Floodplain Management Grants program. This project is expected to be finalised in December 2025. However, as an interim measure, Council commissioned overland flood modelling. This modelling utilised the same data and methodology as the riverine flood modelling and mapping within the mainstream Flood Study. This has resulted in a mapping layer which illustrates the location and likely extent of overland flooding and the relative risk to life and property. The overland flood mapping also includes Flood Planning Constraint Categories (FPCC) which have been identified by the same consultant who prepared the Flood Study (GRC Hydro). This modelling is currently used to inform Council as to the potential for flooding and flood risk beyond riverine areas.
The overland flood model maps are available to view on the Council's website at: https://www.goulburn.nsw.gov.au/Development/Plans-Strategies#section-10

Both the Flood Study and the overland flow modelling have accounted for climate change utilising the ARR2019 methodology to determine the projected increase in precipitation intensity. These details have been utilised to determine increased rainfall for each of the flood events up to 2090 and incorporated into the riverine and overland flow modelling. Additionally, the 0.5m freeboard above the 1% AEP for certain development accounts for climate change variability.

The adopted *Goulburn Floodplain Risk Management Study and Plan* (*The Flood Study*) has assessed riverine flooding and associated risk in Goulburn. The extent of this study area includes the subject site which is not directly impacted by riverine flooding (due to its elevation). The site is included in the area where overland flow modelling has been undertaken as a separate project outside of the Goulburn Flood Study. It illustrates that portions of the site are inundated by overland flooding but this inundation aligns with the locations of the non-perennial water courses.

The overland flow modelling, illustrated in **Figure 5,** indicates that the identified drainage channels experience flood inundation.

Council's Overland Flood Modelling makes clear the subject site is flood prone to some extent and as such Ministerial Direction 4.1 applies.

The *NSW Flood Prone Land Policy's* (*The Flood Policy*) primary objective is to reduce the impacts of flooding and improve community resilience. The policy recognises that flood prone land is a valuable resource and proposals for rezoning should be the subject of careful assessment which incorporates consideration of local circumstances.

The policy requires:

- a merit-based approach to be adopted for all development decisions in the floodplain;
- a reduction in flooding impacts and liability on existing developed areas
- limiting the potential for flood losses in all areas proposed for development by the application of ecologically sensitive planning and development controls.

The *Flood Risk Management Manual* (the Manual) requires planning proposal authorities to consider the principles of the Manual and advice provided in the supporting Toolkit. The Manual establishes the following Vision:

> *"Floodplains are strategically managed for the sustainable long-term benefit of the community and the environment, and to improve community resilience to floods".*

and the following 10 principles for flood risk management:

1. Establish sustainable governance arrangements;
2. Think and plan strategically;
3. Be consultative;
4. Make flood information available;
5. Understand flood behaviour and constraints (for the full range of floods);
6. Understand flood risk and how it may change (for the full range of floods);
7. Consider variability and uncertainty;
8. Maintain natural flood functions;
9. Maintain flood risk effectively, and
10. Continually improve the management of flood risk.

The Manual highlights the requirement for a robust understanding and analysis of risk which can then be deployed to determine whether the risk is acceptable and determine if additional action is required to further reduce identified residual risk.

The *Flood Risk Management Toolkit* (the Toolkit) provides more detailed guidance on how to meet the objectives of the Flood Policy and Manual and these documents have been considered in the development of this planning proposal. The following documents in the Toolkit are especially pertinent to this planning proposal:

- *EM01- Support for Emergency Management Planning*
- *LU01- Flood Impact and Risk Assessment*
- *FB01- Understanding and Managing Flood Risk*
- *MM01- Flood Risk Management Measures*

The proposal's consistency with The Flood Policy, The Manual and Toolkit are largely addressed separately in the sections responding to Ministerial Direction 4.1 in the accompanying Planning Proposal.

In relation to this site, the main issues identified for consideration in this Flood Impact Risk Assessment are **site access/evacuation** and the **safe occupation** of proposed residential lots.

6. Warning Times, Evacuation, Isolation, Duration

In accordance with *EM01 Support for emergency management planning*, evacuation is considered in the context of this site, with emergency management responses tested.

As stated in the NSW SES' *Goulburn Mulwaree LGA Local Flood Plan*, consultation with NSW SES is required as a part of the strategic planning for flood affected land to avoid additional risk. As stated at the beginning of this preliminary FIRA Council will undertake further consultation with the NSW SES in relation to the planning proposal and this FIRA.

This FIRA considers:

- The potential for this community to be isolated
- the availability for warning in this location/warning times
- evacuation capability
- compatibility with the existing EM response strategy
- whether occupants are safe and self-sufficient in the event of a flood
- Ability to self-evacuate to a place of safety

The main consideration is the potential for this community to be isolated and an evacuation route from the site to a suitable destination.

Flooding is defined in Flood Risk Management Guideline AG01 (prepared by the then Department of Planning and Environment) as a *Flood that is sudden and unexpected*, *often caused by sudden local or nearby heavy rainfall*. It is *often defined as flooding that peaks within 6 hours of the causative rain*.

The subject site's elevation varies from 658 - 694 metres, with the Wollondilly River located 34 metres below the lowest elevation of the land.

Gorman Road and Sydney Road, east of Bridge Street is outside of the extent of riverine PMF flood level. Flooding to the east of the river (outside of the major tributaries) is overland flooding and is likely to be characterised as flash flooding (as there will be little to no warning). However, given the relative elevation of the area it is also considered that isolation times outside of riverine crossing points will be of relatively short duration.

The subject site is cut off from the central portion of Goulburn via the Sydney Road bridge once flooding is above a 0.2% AEP (Annual Recurrence Interval) Event (1 in 500) as identified in Table 15 in the *Goulburn Floodplain Risk Management Study and Plan 2022.*

Government agency consultation with DCCEEW and SES raised concerns over considering the full range of floods and further consideration of flood behaviour. Additional modelling information has been commissioned from Worley Consulting and is provided in **Appendix 17**. The data provides the evidence to demonstrate that the duration of flooding during a PMF is not longer than 120 minutes or 2 hours. This is for water depths of up to 0.15 metres. For depths over 0.15 metres, the duration of flooding is up to 22 minutes. It is noted that the 1% AEP 9 hour storm produced the highest duration of inundation figures (up to 1070 minutes or almost 18 hours) for each of the reporting locations, however, during this flood event, depth and velocity data is low and enables safe evacuation within a H1 hazard classification.

These durations are considered acceptable and do not pose any unacceptable risk.

7. Evacuation Point

Noting access into central Goulburn can be facilitated up to and including a 0.2% AEP, the most direct route from the site to a potential evacuation location is from Gorman Road to Sydney Road, and eastward towards northbound Hume Highway (towards Sydney), where a number of suitable evacuation refuges are available.

The following **Figure 7** identifies the evacuation route to Sydney Road and northbound Hume Highway.

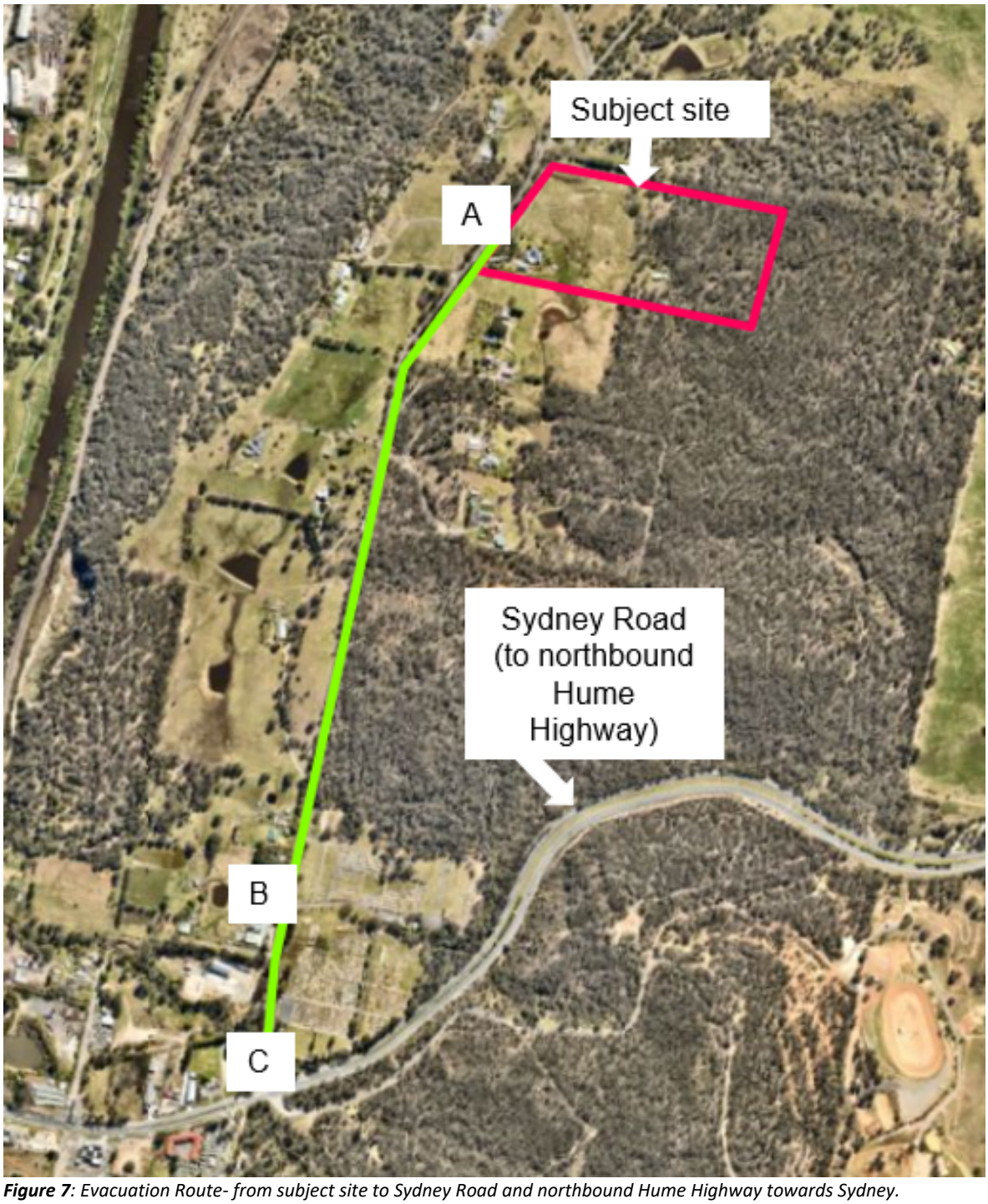


***Figure 7**: Evacuation Route- from subject site to Sydney Road and northbound Hume Highway towards Sydney.*

Table 1 below identifies the worst depths and velocities, during a PMF event, in the vicinity of each flood crossing point marked A – C between the site and at the intersection of Gorman Road and Sydney Road.

Table 1: *Overland Flooding Points PMF and Hazard Ratings – Site to Sydney Road junction.*

PMF	A	B	C
Depth (m)	0.11	0.47	0.01
Velocity (m/s)	1.26	1.04	0.19
Duration (mins) > 0 m depth	120	118	117
Hazard Category	H1	H2	H1

The hazard categories used are from the Australian Emergency Handbook 7, with the vulnerability thresholds as specified in Figure 8 and Figure 9 below.

Hazard Classification	Description
H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles, children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

Figure 8*: Flood Hazard Vulnerability Thresholds*

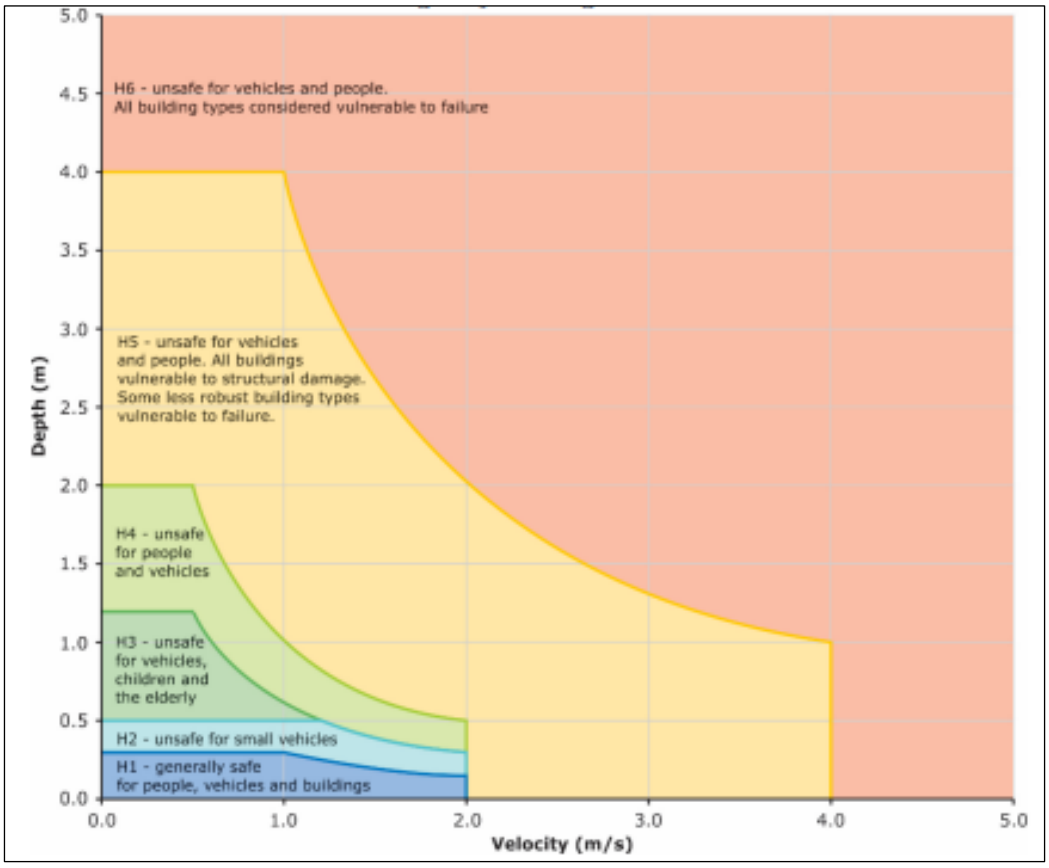


Figure 9*: Flood Hazard Curves (Australian Emergency Handbook 7)*

Generally Gorman Road can be safely accessed by a large vehicle during a PMF event.

Spot data is provided from Gorman Road from the site frontage up to the junction with Sydney Road. See **Figure 10** and **Figure 11** below.

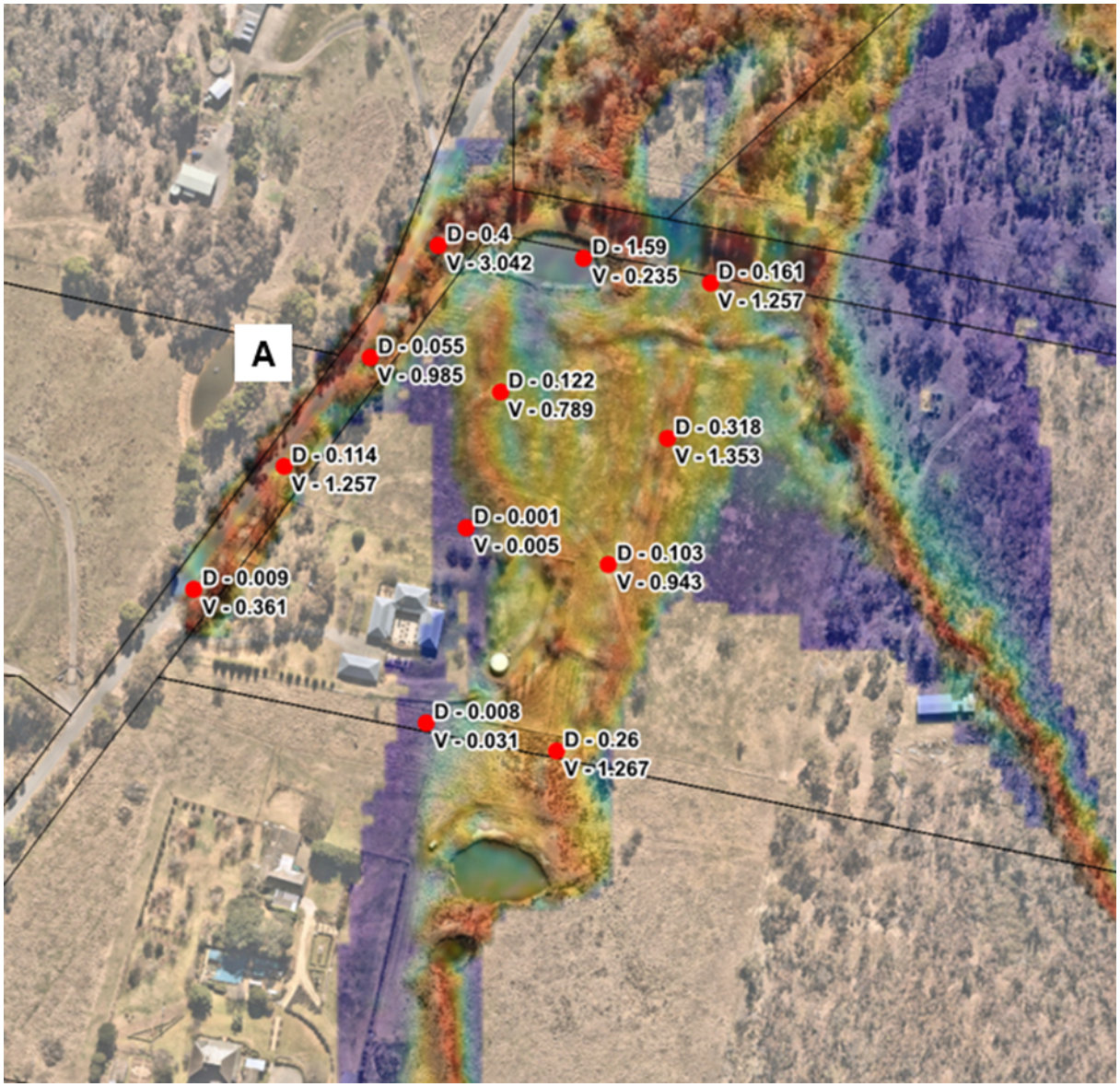


***Figure 10**: PMF Event – Point A at Gorman Road, within the site frontage of the subject site. Depths are in metres and velocities are in metres per second.*

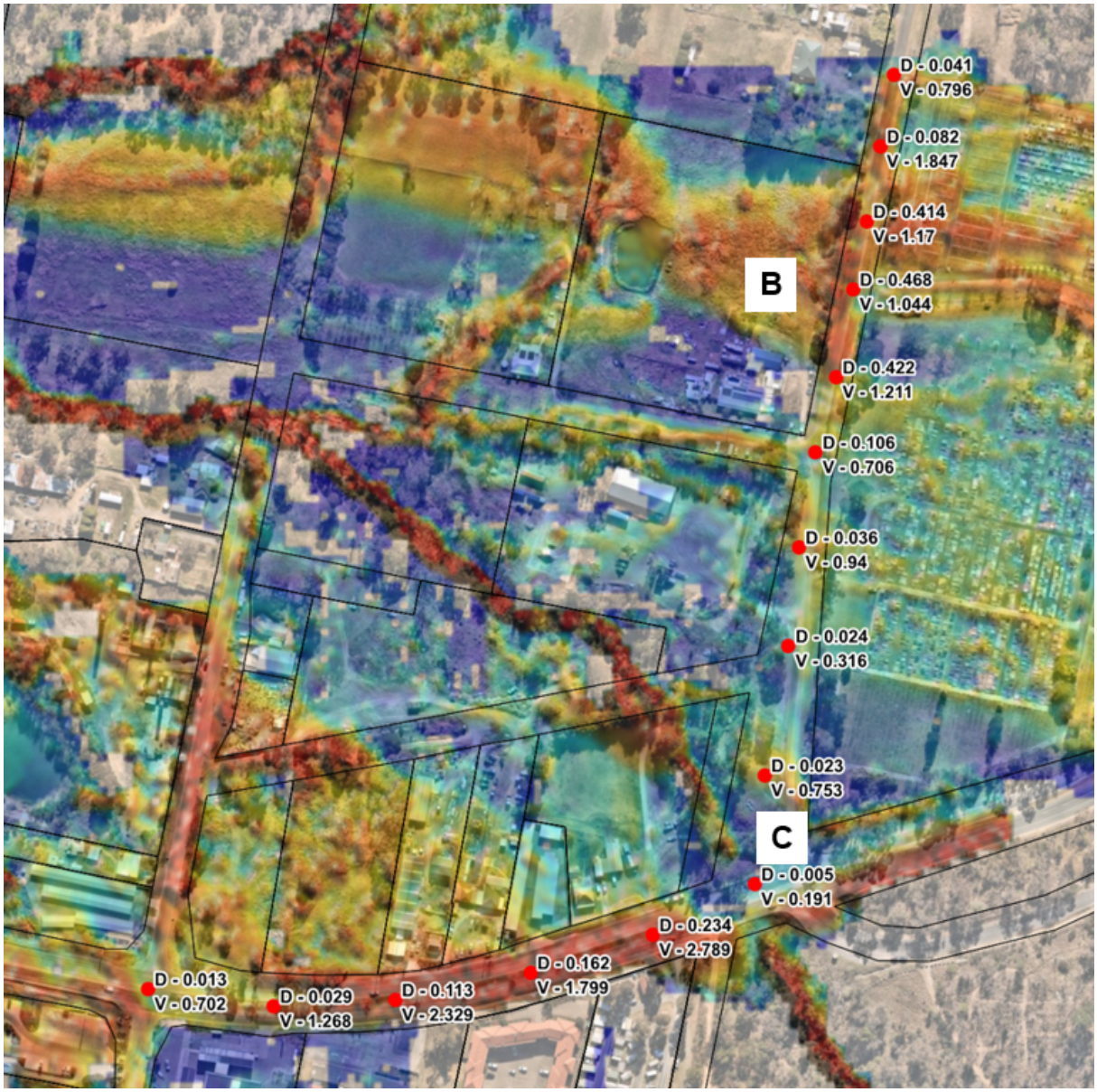


Figure 11: *PMF Event- Point B at Gorman Road, within the frontage of 14 Gorman Road, and Point C, at Sydney Road. Depths are in metres and velocities are in metres per second.*

The modelling shows that for the PMF, depths of flood water over Gorman do not exceed 11cms at Point A, 47cm at Point B, and 0.01cm at Point C. The flood risk for evacuation is low. In this case, a depth of 47cms is safely accessible by a large vehicle.

8. Warning Times

The concept plan in association with the Council modelling suggests that the site can achieve safe access to Gorman Road, during a PMF event.

The precinct is relatively elevated and sits above the flood plain for the Wollondilly River. Drainage corridors on site and along access roads are mostly non – perennial water courses. Whilst some warning may be available for crossing points at the Wollondilly River (where riverine flooding occurs) warning times associated with non-perennial water courses where

crossing roads is likely to be short (flash flooding). It is also noted due to the relative elevation of this precinct that durations would be relatively short for isolation within the precinct itself. The data in Appendix 17 confirms that warning times are up to 4 minutes during a PMF event, with the longest up to 175 minutes during a 5% AEP 9 hour storm.

In summary, the following points are made in relation to evacuation, warning times, isolation, and duration:

- Access into central Goulburn can be facilitated up to and including a 0.2% AEP flood.
- Based on the available overland flood data, access can be achieved to Gorman Road and Sydney Road, to gain access to northbound Hume Highway, up to and including the 0.05% AEP event.
- Evacuation as per the NSW SES *Goulburn Mulwaree LGA Local Flood Plan* (Refer Section 5.8) would not be required as there is suitable area within the proposed R5 zoned land to locate future development above flood prone land, up to an including the PMF.
- Evacuation (if required) would largely be horizontal – moving across an elevated area above the Wollondilly floodplain.
- The evacuation route to gain access to northbound Hume Highway is relatively close to the site (i.e. approximately 1.5 kms).
- Access can be achieved during a PMF event, for a large extent of the entire evacuation route, within a low hazard category for people and vehicles.

9. Safe Occupation

This planning proposal is seeking the rezoning of part of the existing RU6 Transition zoned site to a residential use. The concept plan has demonstrated that access from Gorman Road up to and including a future building site can be achieved to ensure that safe access can be facilitated, up to and including a PMF event. Future built development can also occur within the part of the site that is flood free, up to and including a PMF event, whilst also ensuring a neutral or beneficial impact on water quality can be achieved.

A more detailed understanding of depths and velocities provided from the overland flood modelling for the 5%, 1% AEP, 0.05% AEP and PMF event are provided in **Figure 13, Figure 14** and **Figure 10** and **Figure 11** respectively.

It is noted that the 5% overland flood data is based on hazard category classifications as per **Figure 12.**

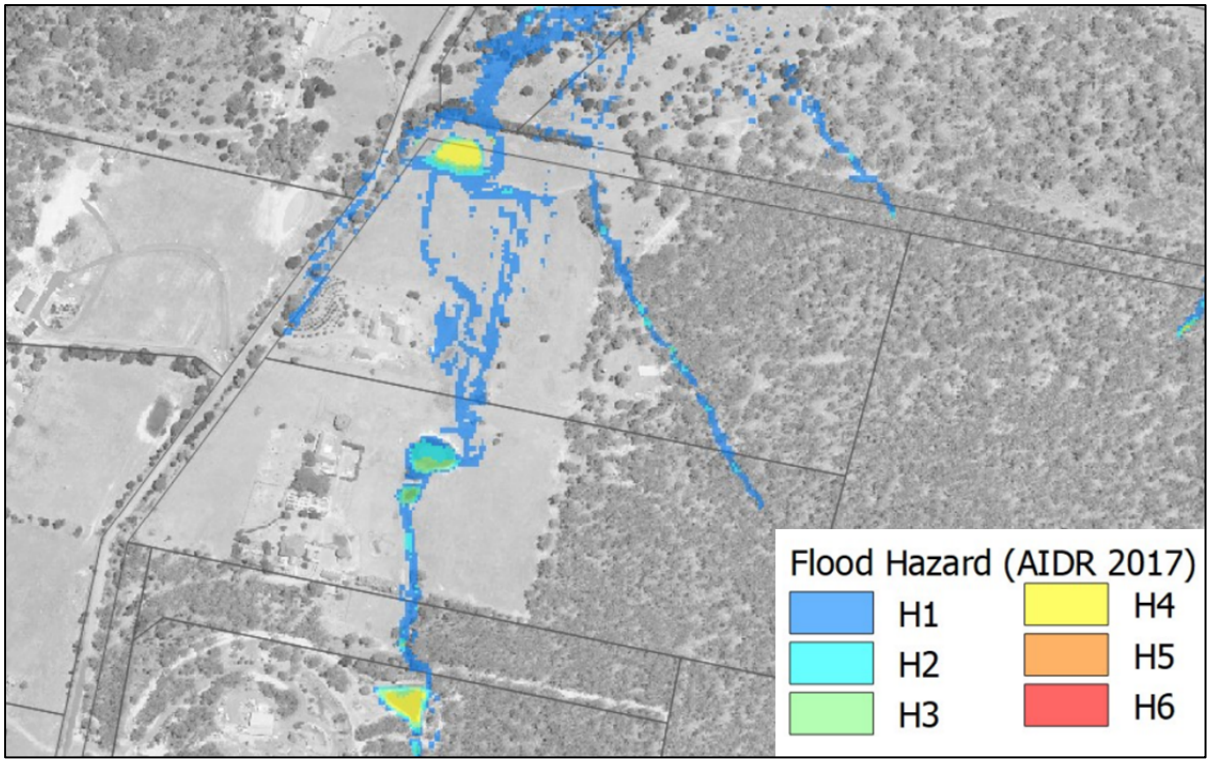


Figure 12: *5% AEP extent and Hazard Category classifications (source: Goulburn Overland Flow Modelling Final Report, GRC Hydro, January 2021)*

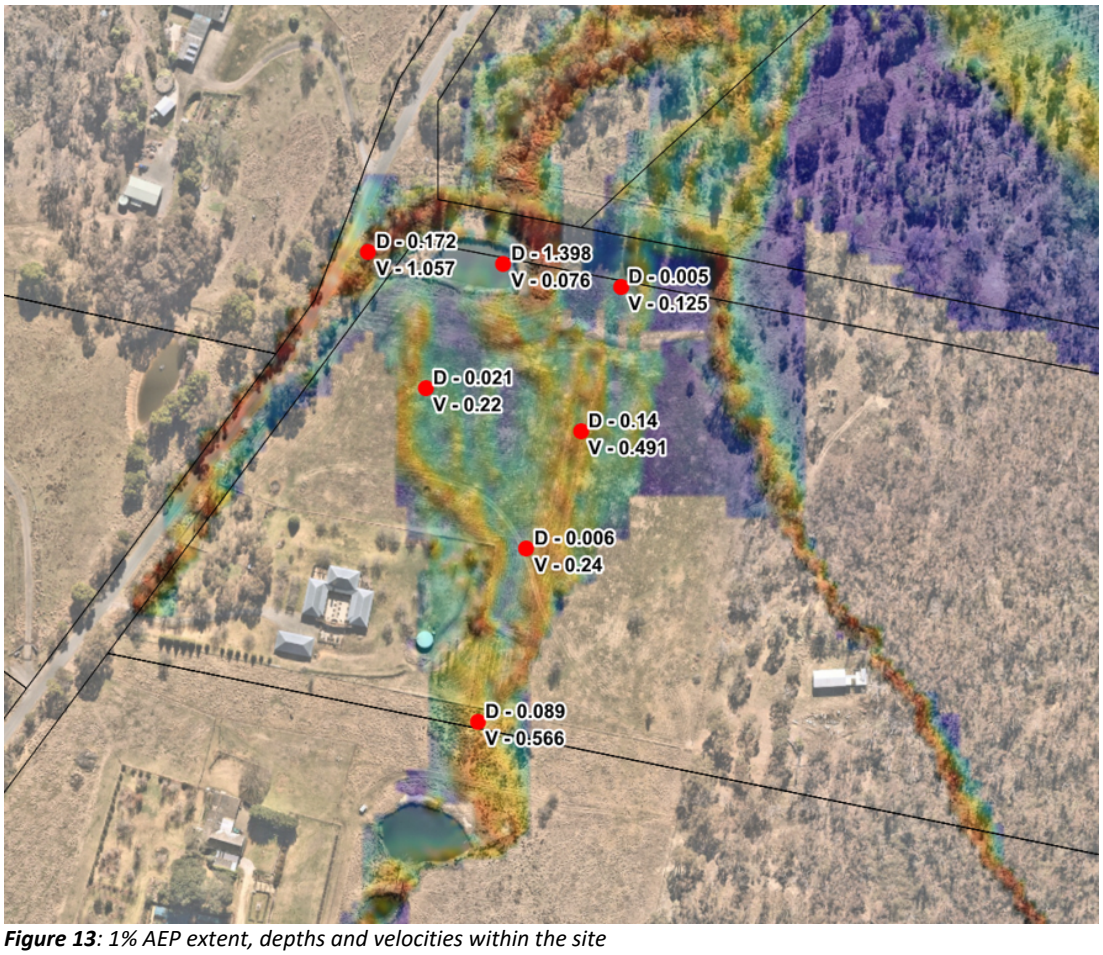


Figure 13*: 1% AEP extent, depths and velocities within the site*

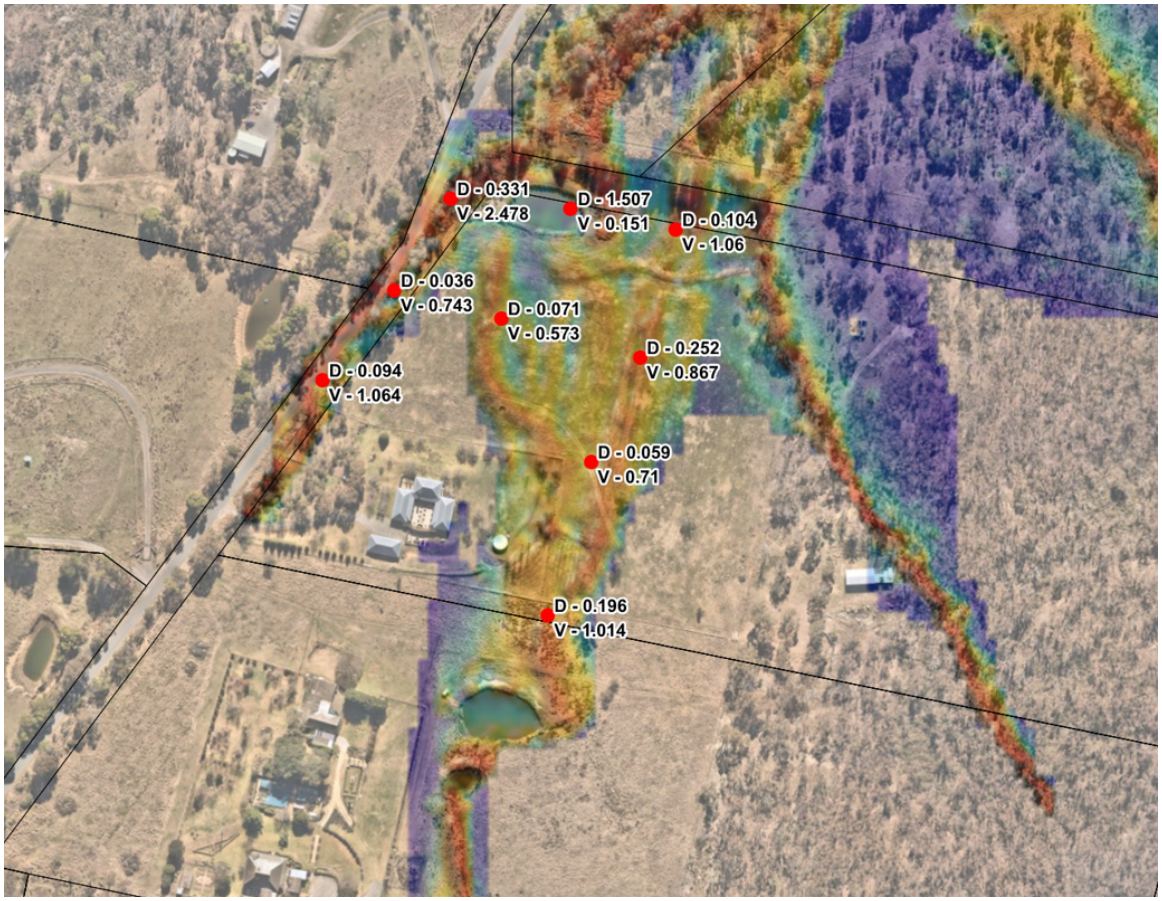


***Figure 14**: 0.05% AEP extent, depths and velocities within the site*

The depths identified for the 5%, 1%, 0.05% AEP and PMF event are shallow and within the low risk hazard category.

10. Planning Risk Management Measures – Future Subdivision

The subject site presents the safest and least hazard category for access, and future built development can be located within flood free areas.

To safeguard the above, the *GM LEP 2009* contains the following provisions that relate specifically to flooding:

5.21 Flood planning

(1) The objectives of this clause are as follows—
(a) to minimise the flood risk to life and property associated with the use of land,

(b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,

(c) to avoid adverse or cumulative impacts on flood behaviour and the environment,

(d) to enable the safe occupation and efficient evacuation of people in the event of a flood.

(2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—
(a) is compatible with the flood function and behaviour on the land, and

(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and

(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and

(d) incorporates appropriate measures to manage risk to life in the event of a flood, and

(e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

(3) In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters—

(a) the impact of the development on projected changes to flood behaviour as a result of climate change,

(b) the intended design and scale of buildings resulting from the development,

(c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood,

(d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.

(4) A word or expression used in this clause has the same meaning as it has in the Considering Flooding in Land Use Planning Guideline unless it is otherwise defined in this clause.

(5) In this clause—

Considering Flooding in Land Use Planning Guideline means the *Considering Flooding in Land Use Planning Guideline* published on the Department's website on 14 July 2021.

flood planning area has the same meaning as it has in the Flood Risk Management Manual.

Flood Risk Management Manual means the *Flood Risk Management Manual,* ISBN 978-1-923076-17-4, published by the NSW Government in June 2023.

5.22 Special flood considerations

(1) The objectives of this clause are as follows—

(a) to enable the safe occupation and evacuation of people subject to flooding,

(b) to ensure development on land is compatible with the land's flood behaviour in the event of a flood,

(c) to avoid adverse or cumulative impacts on flood behaviour,

(d) to protect the operational capacity of emergency response facilities and critical infrastructure during flood events,

(e) to avoid adverse effects of hazardous development on the environment during flood events.

(2) This clause applies to—

(a) for sensitive and hazardous development—land between the flood planning area and the probable maximum flood, and

(b) for development that is not sensitive and hazardous development—land the consent authority considers to be land that, in the event of a flood, may—

(i) cause a particular risk to life, and

(ii) require the evacuation of people or other safety considerations.

(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority has considered whether the development—

(a) will affect the safe occupation and efficient evacuation of people in the event of a flood, and

(b) incorporates appropriate measures to manage risk to life in the event of a flood, and

(c) will adversely affect the environment in the event of a flood.

(4) A word or expression used in this clause has the same meaning as it has in the Considering Flooding in Land Use Planning Guideline unless it is otherwise defined in this clause.

(5) In this clause—

Considering Flooding in Land Use Planning Guideline—see clause 5.21(5).

flood planning area—see clause 5.21(5).

Flood Risk Management Manual—see clause 5.21(5).

probable maximum flood has the same meaning as in the Flood Risk Management Manual.

sensitive and hazardous development means development for the following purposes—

(a) caravan parks,

(b) correctional centres,

(c) educational establishments,

(d) emergency services facilities,

(e) hazardous industries,

(f) hazardous storage establishments,

(g) hospitals.

There is no adopted Flood Planning Area (FPA) for this site. In situations such as this the 1% AEP Event plus a freeboard of 0.5m is applied as per Chapter 3 of the *GM DCP 2009* (and Appendix J – Flood Policy).

Despite clause 5.21, clause 5.22 is applicable to a future development proposal that is flood impacted, whether or not the use is sensitive and hazardous. Clause 5.22(2)(b) would apply to any Development Application where the assessment process reveals that a flood event would pose a risk to life and requires the evacuation of people or other safety considerations.

Additionally, it should be noted that the *Building Code of Australia (BCA)* specifies minimum floor levels for dwellings, generally being 150mm for slab on ground.

In summary the main points identified in relation to safe occupation are:

- The site is elevated and not affected by riverine flooding.
- Safe access from Gorman Road to a flood free development site can be facilitated.
- Flooding is confined to defined overland flow paths.
- Clauses 5.21 and 5.22 of *GM LEP 2009* may be applied.
- The *GM DCP 2009* and Flood Policy will apply to any further subdivision.
- The *GM DCP 2009* requires a FPA of 0.5m (above 1% AEP) for areas not affected by riverine flooding as per current requirements.
- The *BCA* also specifies minimum floor levels for a dwelling (regardless of other planning provisions).
- It is considered that the site has the capacity to be developed with an additional lot having safe access and a dwelling located above flood affected land.

11. Ability of Residents to Be Self Sufficient During Events

Residents would be able to self-evacuate and travel within the precinct subject to some crossing of roads at low hazard categories in a 5%, 1%, 0.05% AEP. This is also the case for the PMF, except within Point B shown in **Figure 11** where a H2 classification exists and

evacuation can be facilitated by a large vehicle. Residents would have access to Sydney Road and northbound Hume Highway, where several evacuation locations could be accessed (to provide food, water and other services such as access to toilet and shower).

In relation to self-sufficiency, the future additional lot will not be serviced and future development will require the incorporation of independent water and on-site waste-water management systems. Future on site waste-water management systems are capable of achieving neutral or beneficial water quality impacts.

12. Compatibility with Emergency Response Plans

The context of flooding on the site as already discussed would suggest that evacuation generally as per the NSW SES *Goulburn Mulwaree LGA Local Flood Plan* (Refer Section 5.8) would not be required. Dwellings will not be inundated; therefore, evacuation would not be desirable as per the Local Flood Plan, unless due to a medical event.

13. Additional Impact on Emergency Services

As discussed earlier, the site can easily access services that are available along or within easy access from northbound Hume Highway. Emergency access to the site is available from central Goulburn up to and including a 0.2% AEP, and during a PMF event from the Hume Highway to the north.

The site is within an elevated precinct above the riverine flood plain of the Wollondilly River. Safe occupation of dwellings is achievable during all flood events including the PMF. Therefore, no evacuation is required except during a medical emergency.

It is noted that emergency services are located in central Goulburn (south of the Wollondilly River) including NSW Police, Goulburn Base Hospital, NSW Ambulance.

The recently completed SES Operations Centre is located on the eastern side of the Mulwaree River (Hetherington Street) and is further separated from the central section of Goulburn, noting Sydney Road is cut off above a 0.2% AEP event.

14. Conclusion

The application of clauses 5.21 and 5.22 of the GM LEP and a 0.5m FPA as per the *GM DCP 2009* and Flood Policy are mitigations to avoid adverse risk from overland flooding. The development of flood free areas above the PMF for dwellings and most of the road network on this site is considered achievable.

The Gorman Road Precinct is located above the Wollondilly floodplain and is therefore not subject to riverine flooding. The area would be cut off from central Goulburn in a PMF Event. However, there are sufficient services north of Goulburn along the Hume Highway available to meet the needs of residents if access west of Sydney Road over Mulwaree River Ponds is not possible.

The rising road classification (refer **Figure 4** and **Figure 15**) would not be exacerbated as a result of this Planning Proposal.

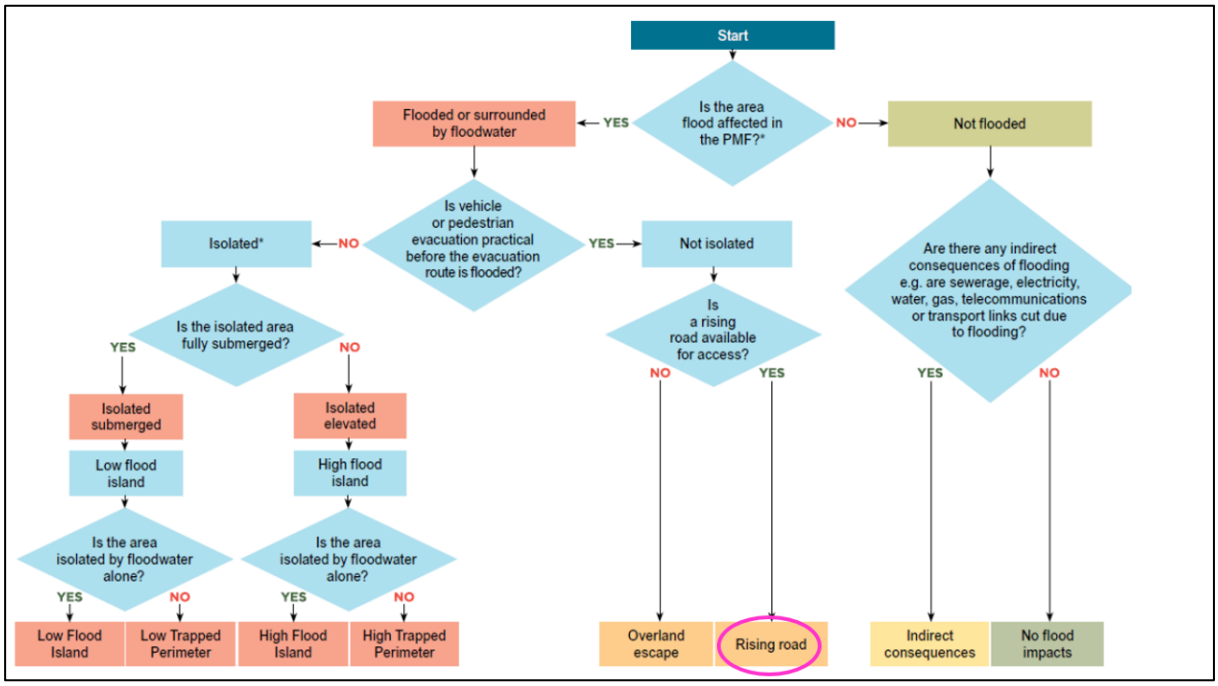


***Figure 15**: Flood Emergency Response Classifications – Post Mitigations Identified in this FIRA*

In summary, the Planning Proposal demonstrates consistency with all the requirements of Direction 4.1 as demonstrated in **Table 2** below.

***Table 2**: Table summarising compliance with Ministerial Direction 4.1 Flooding*

Ministerial Direction	**Summary of compliance**
Direction 4.1(1) and (5)	The Planning Proposal is consistent with the Policy, Guideline and Manual as referenced in this Direction, and the Goulburn Mulwaree Development Control Plan (DCP) Chapter 3.8 Flood Affected Land, guided by the Goulburn Floodplain Risk Management Study and Plan 2022. There are parts of the site that can accommodate a future dwelling and ancillary development wholly above the PMF. Shelter in place can be safely facilitated. Some parts of the proposed access with the site are subject to inundation although these levels are very shallow and within the least category classification, thereby allowing safe access by vehicle. Evacuation (if required) can be facilitated via Gorman Road to northbound Hume Highway via Sydney Road largely within a least hazard classification, up to and including a 0.05% ARI flood.
Direction 4.1(2) and (3)	Overland flood prone land does not form part of The Flood Study, and therefore, there is no defined FPA. However, there are

	provisions within Chapter 3.8 of the DCP that apply to areas outside The Flood Study. The *Goulburn Mulwaree Local Environmental Plan (LEP*) contains provisions to safeguard against any future adverse impacts on flood behaviour, the safety of people, and the environment. There are also provisions in place for sensitive and hazardous uses, ensuring that safe occupation and efficient evacuation can be facilitated. There is sufficient area within the site to accommodate future development on the site without the risk of adverse stormwater impacts to downstream property.
Direction 4.1(4)	The proposal does not seek the uses to which the special flood considerations apply. The DCP includes controls to restrict the placement of critical and sensitive uses up to and including FPCC 3 and potentially up to and including the PMF.

Council considers the flood risk associated with the development of this site to be minor. There is sufficient area to enable future development to be located within the parts of the site that area above the PMF and therefore potential impacts to downstream property are avoided. Safe occupation can be facilitated and if required, safe evacuation can occur within a low hazard classification.

It is considered onerous to impose restrictive re-zoning of flood prone areas within the subject land when there are already controls in place to safeguard development in these locations.

Cumulative impacts in the Gorman Road Precinct as identified in *The Strategy* have been considered. This Precinct has very limited capacity and its intent is to retain its rural transition character. There is very limited capacity for additional future residential development, especially considering additional impacts from overland flooding which were not realised at the time the Strategy was finalised.

It is not expected that there will be potential for increased government spending in the event of a flood, as the risk is low and the ability to shelter in place can be facilitated, as well as the need to evacuate (if required).

15. Appendices

Appendices included within this planning proposal are listed in the table below:

Appendix 1	Exhibition Planning Proposal 158 Gorman Road
Appendix 2	Concept subdivision plan
Appendix 17	158 Gorman Road – overland flooding affectation of roads