

Our ref: 1002 – Lot 32 Tuckeroo Ave, Mullumbimby
Your ref: PP26.2025.5

21 October 2026

The General Manager
Byron Shire Council
PO Box 219 DX 20007
Mullumbimby NSW 2482

Dear Sir,

Re: Lot 32 Tuckeroo Avenue, Mullumbimby

Flood Assessment

As advised by Byron Shire Council Planner, Cameron Thiessen, in an email dated 8 September 2026, the Department of Planning has requested additional flooding information in relation to the Planning Proposal for the rezoning of Lot 32 DP1169053 at Tuckeroo Avenue.

On 21 October 2026, Byron Shire Council provided the following table of modelled flood levels extracted from the North Byron Floodplain Risk Management Study, as applicable to the subject site at Lot 32 DP 1169053, Tuckeroo Avenue, Mullumbimby.

Flood Event	Flood Level (m AHD)
1 Year ARI	Not Available
5 Year ARI	5.37
10 Year ARI	5.44
20 Year ARI	5.54
50 Year ARI	5.59
100 Year ARI	5.64
PMF	6.30

Table 1 – Byron Shire Council supplied flood levels for Lot 32

The Department of Planning has requested additional information addressing flood risk and evacuation matters, as outlined below:

1) Mapping of the PMF extent, flood depths and flood hazard vulnerability categories across the subject land

The North Byron Floodplain Risk Management Study & Plan is publicly available on the Byron Shire Council website. Appendix O-16 shows the Peak Flood Levels for the Probable Maximum Flood (PMF) event for Mullumbimby and identifies the subject site, as shown in **Figure 1**. The PMF Flood Level is RL 6.30m AHD and encroaches in the south-western corner of Lot 32.

The North Byron Floodplain Risk Management Study & Plan Appendix O-10 shows the 1% AEP (100-year ARI) flood levels, as shown in **Figure 2**. The 100-year ARI Flood Level is RL 5.64m AHD and encroaches in the south-western corner of Lot 32.

The North Byron Floodplain Risk Management Study & Plan Appendix O-4 shows the 10% AEP (10-year ARI) flood levels, as shown in **Figure 3**. The 10-year ARI Flood Level is RL 5.44m AHD and encroaches in the south-western corner of Lot 32.

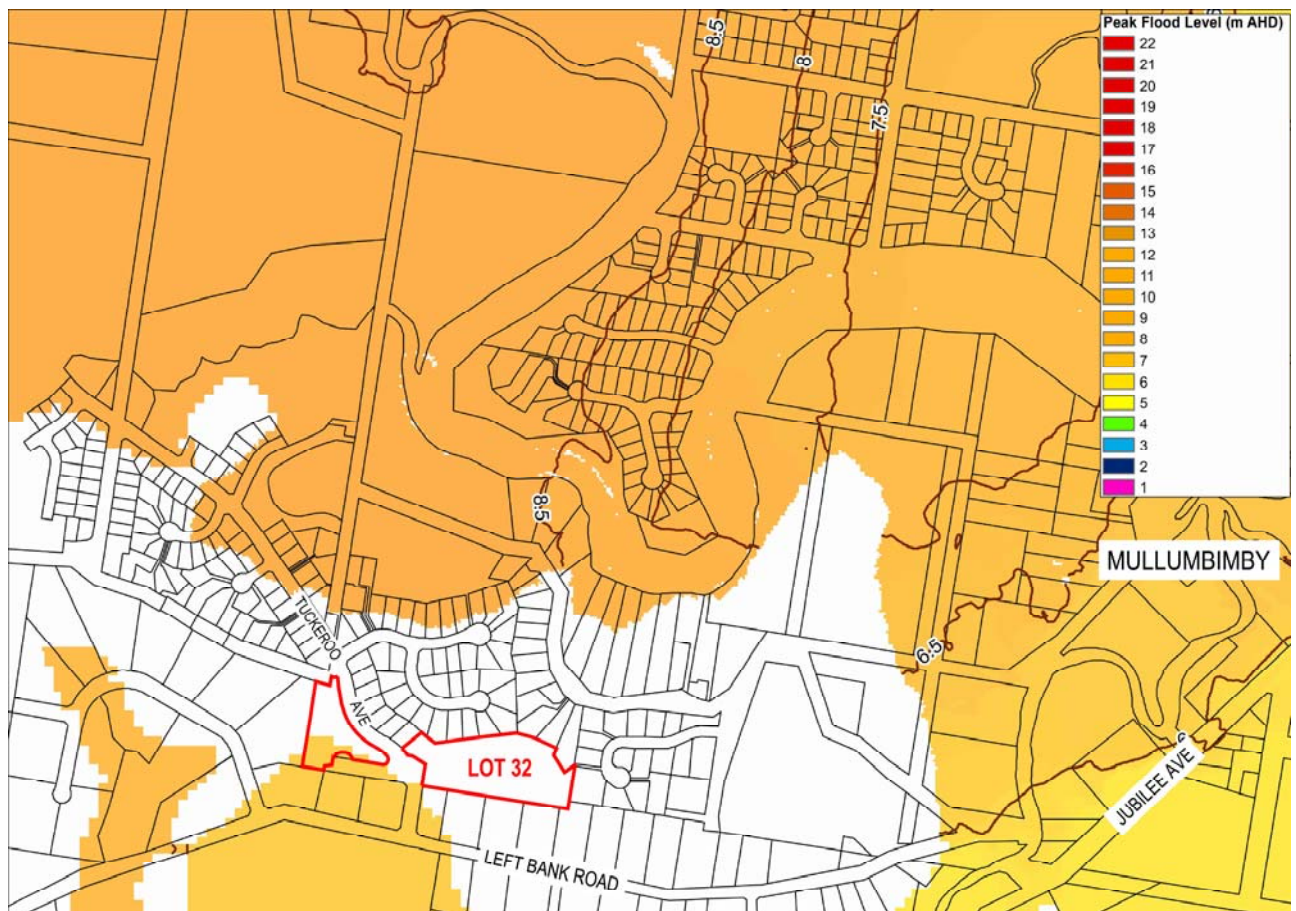


Figure 1 PMF Peak Flood Levels for Mullumbimby (Extract)



Figure 2 - 1% AEP (100-year ARI) Flood Levels for Mullumbimby (Extract)

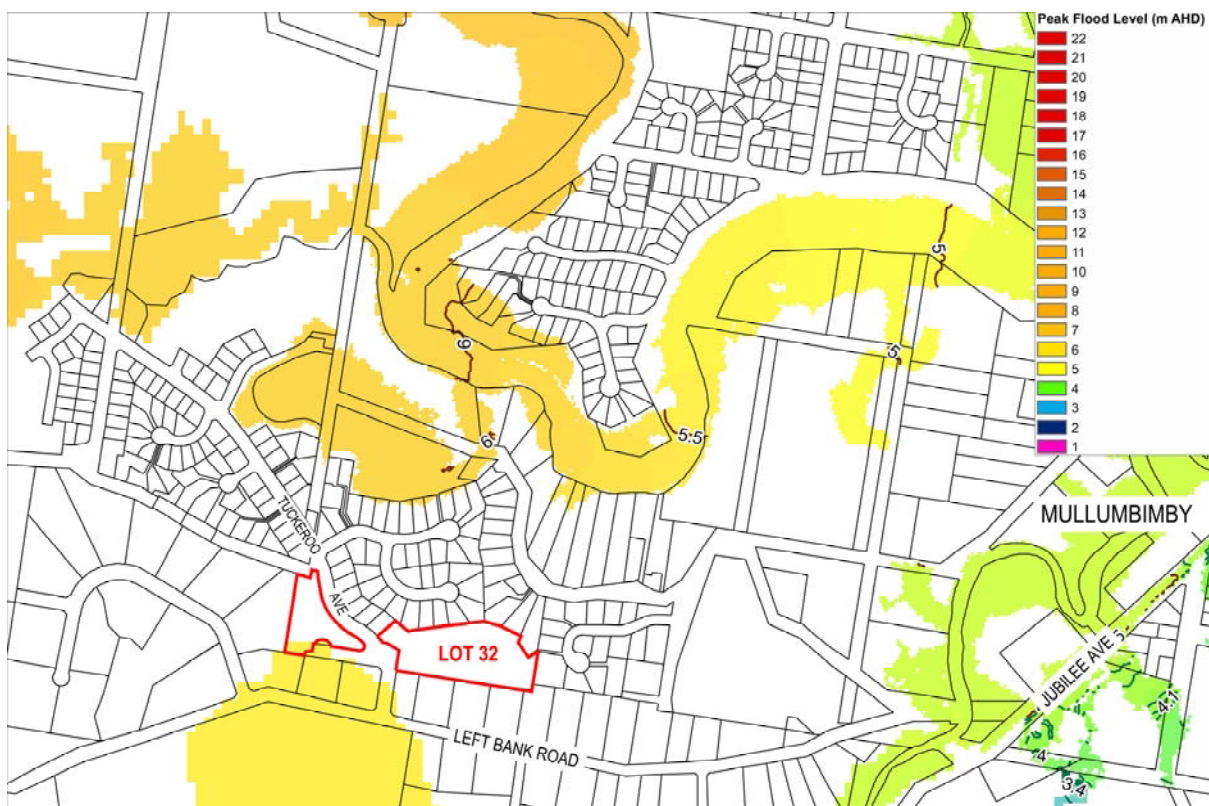


Figure 3 - 10% AEP (10-year ARI) Flood Levels for Mullumbimby (Extract)

PMF flood depths affecting the south-western corner of the site are subject to detailed flood modelling and the final road and earthworks design. It is anticipated that Road 2 and the

lowest proposed residential lot T1 will be designed to provide flood-free access during the 1% AEP (100-year ARI) flood event. Based on the available flood information, the PMF flood depth will be approximately 0.5m deep in this area, with the lowest habitable floor level to be established at the applicable Flood Planning Level, being approximately 0.5 m above the 1% AEP flood level. Raising the FPL on this site by another 160mm would ensure that all floor levels would be located at or above the PMF event.

The **flood hazard** at the end of proposed Road 2 and within conceptual Lot T1 is mapped as Low Hazard in the North Byron 1% AEP 2100 Climate Change Hazard Map available through the Byron Shire Council ArcGIS database.

The NSW Flood Risk Management Guidelines define flood hazard vulnerability categories for people, vehicles and buildings based on the velocity–depth relationship, as illustrated in Figure 4. Based on the flood levels presented in Table 1 and the anticipated road design levels, flooding across the majority of the cul-de-sac is expected to reach a maximum depth of approximately 0.5 m during the Probable Maximum Flood (PMF) event and no more than 0.2 m during the 1% Annual Exceedance Probability (AEP) event.

The southwest corner of the subject site is located within a backwater flood storage area rather than a defined flood flow path. As such, significant flood flows are not expected in this area, and flood velocities are anticipated to be negligible. Accordingly, a design flow velocity of 0 m/s has been adopted for the flood hazard assessment.

Based on the above flood depths and flow velocity, **Figure 4** below has been used to determine the following flood hazard categories for the subject site:

- **1% AEP (100-year) flood event: H1 – Generally safe for people, vehicles and buildings.**
- **Probable Maximum Flood (PMF) event: H2 – Unsafe for small vehicles**
However, generally safe for vehicles, children and the elderly.



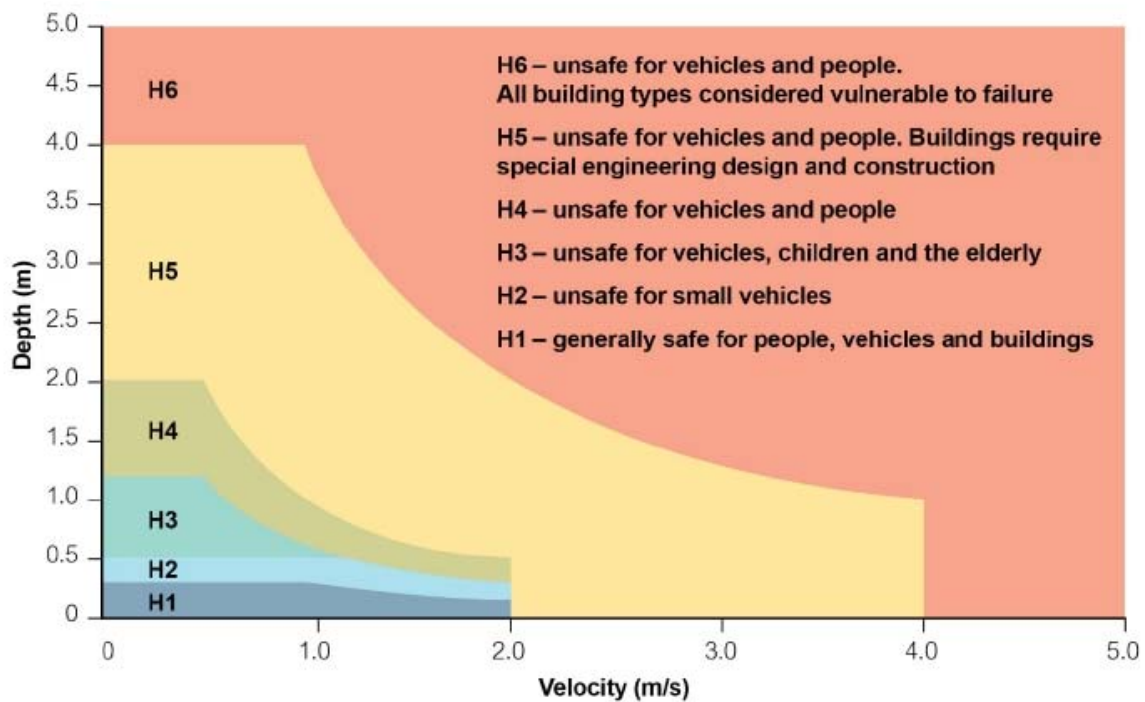


Figure 1 General flood hazard vulnerability curve

Note: Categories H1 to H4 in this guideline are equivalent to low hazard and H5 to H6 equivalent to high hazard in the 2005 *Floodplain development manual* (DIPNR 2005).

Source: Figure 6 AIDR 2017b.

Figure 4 – NSW Flood Risk Management – General flood hazard vulnerability curve

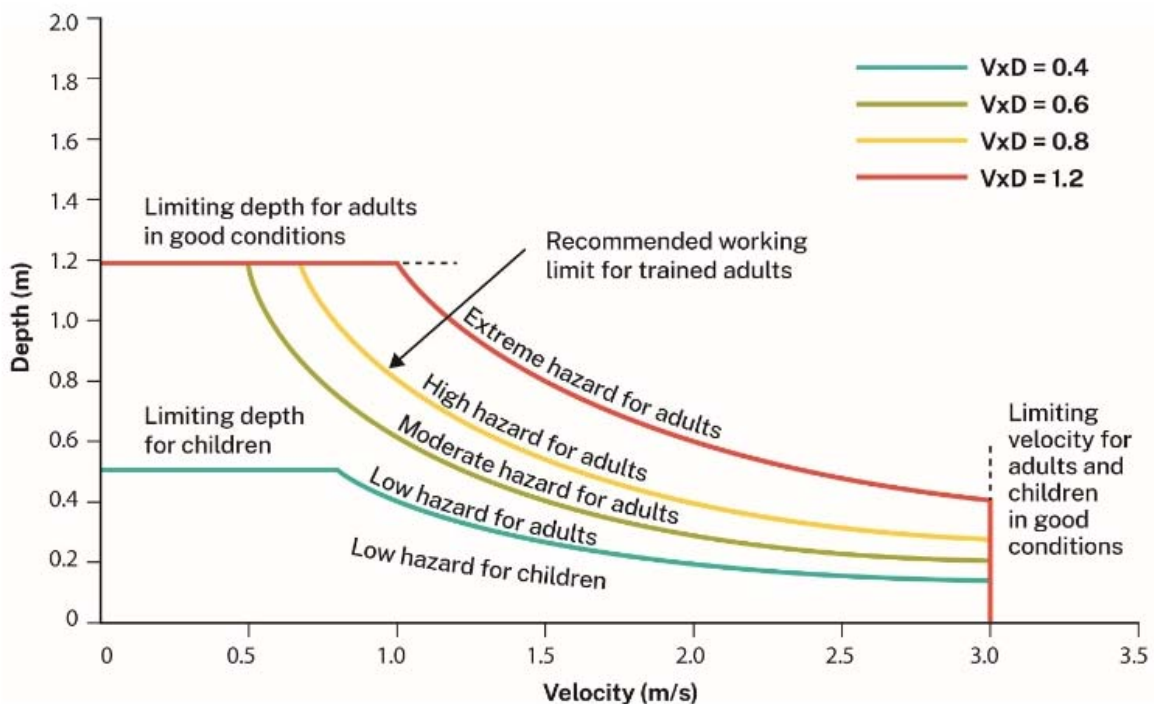


Figure 2 Thresholds for the stability of people in floods

Notes: $D.V = V \times D$ = velocity x depth.

Source: Figure 8 AIDR 2017b; modelled after Cox, Shand and Blacka (2010).

Figure 5 – NSW Flood Risk Management - Stability of people in floods



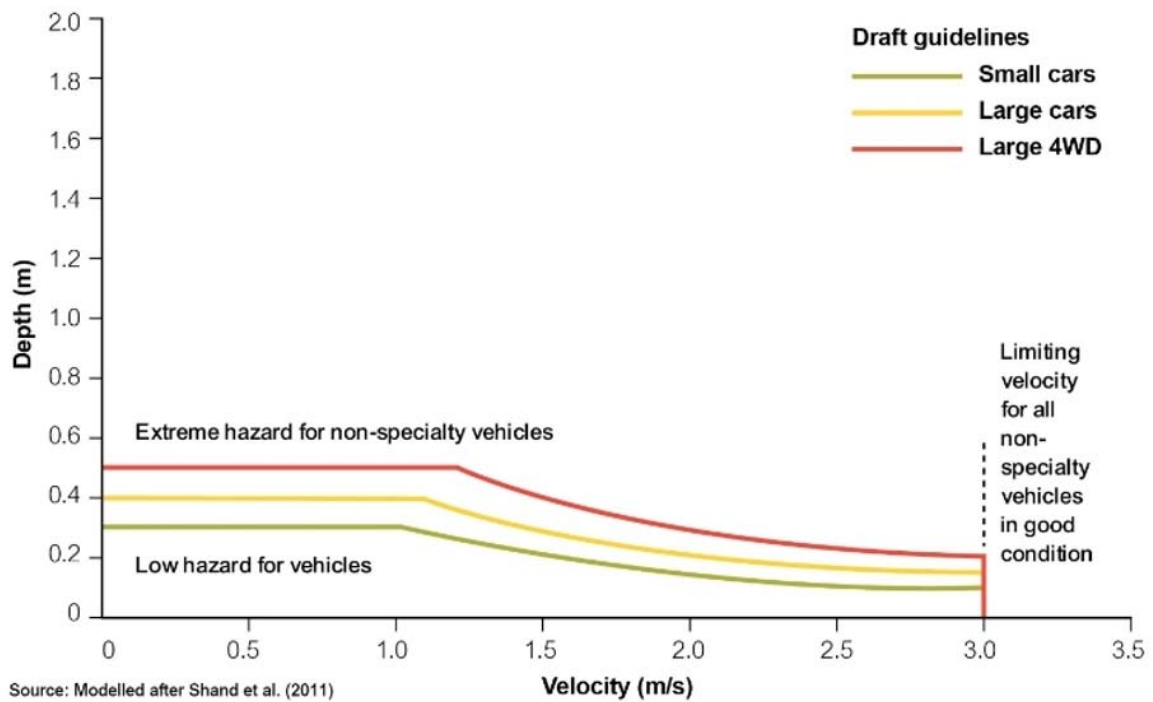


Figure 3 Thresholds for vehicle stability in floods

Source: Figure 9 AIDR 2017b; modelled after Shand et al. (2011).

Figure 6 – NSW Flood Risk Management - Vehicle stability in floods

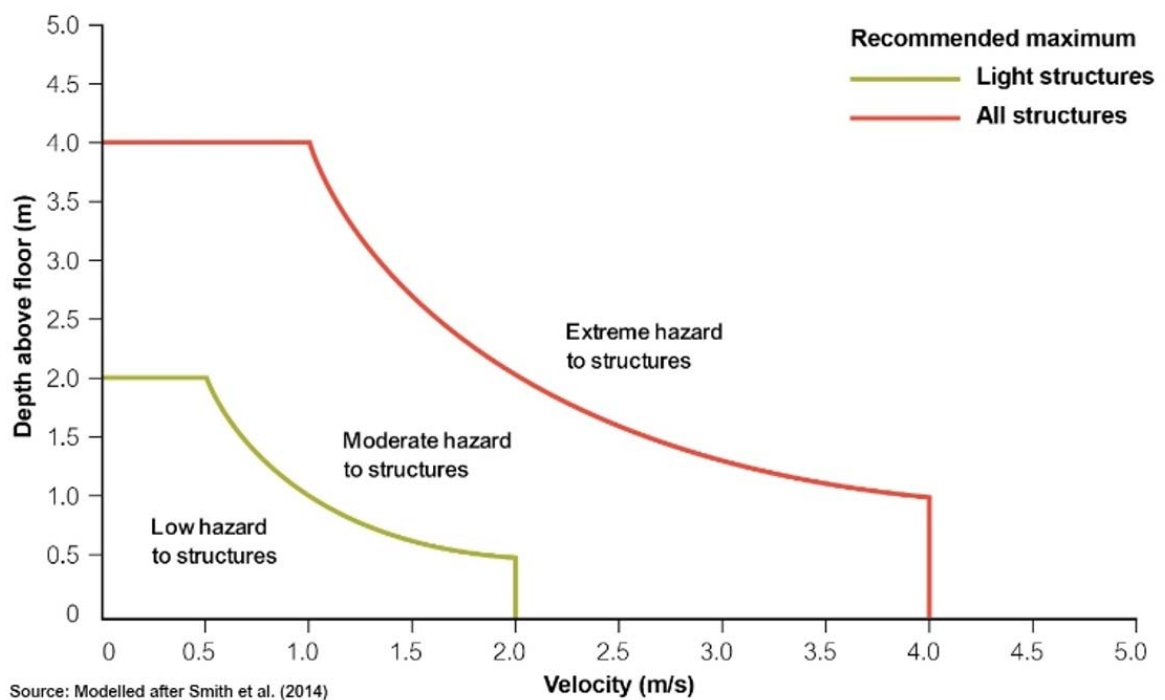


Figure 4 Thresholds for building stability in floods

Source: Figure 10 ADR 2017b; modelled after Smith, Davey and Cox (2014).

Figure 7 – NSW Flood Risk Management - Building stability in floods

Figure 5 above indicates that the flood hazard for people is **low for small children** during the PMF event.

Figure 6 above indicates that the flood hazard for vehicle stability is **low for a large 4WD** during the PMF event. During the 1% AEP (100-year) flood event, the hazard is **low for a small passenger vehicle**.

Figure 7 is subject to the detailed earthworks design for Lot T1 and may not be applicable to the final development. The dwelling is proposed to be constructed with its floor level at or above the PMF flood level and at least 500 mm above the 1% AEP (100-year) flood level. Should Lot T1 remain unfilled, the building stability hazard would be classified as **low hazard to a structure** for a PMF or 100-year event.

2) Identification of the likely flood emergency response classification of the site, including whether the land may become isolated during major flood events

As demonstrated in Figures 1 and 2 above, Left Bank Road to the south and Tuckeroo Avenue to the north would both be cut during the 1% AEP and PMF flood events. Accordingly, the subject site is best classified as a **High Flood Island** in accordance with the SES guidelines.

While evacuation from the site is not considered necessary during a flood event, evacuation routes are available prior to the onset of flooding. These routes would, however, become cut as floodwaters rise during moderate and major flood events.

3) Identification and assessment of the proposed evacuation route(s), including the flood behaviour affecting those routes and the flood event at which access becomes unsafe or unavailable;

The NSW SES provides a detailed Flood Guide for Mullumbimby, while Byron Shire Council maintains an Emergency Dashboard, flood cameras and supporting information relating to flood levels, flood preparedness and flood management.

Based on the available flood information, the following flood levels and associated access constraints are relevant to the subject site:

- **RL 3.91 m:** The Mullumbimby South evacuation route is likely to be closed at Jubilee Avenue.
- **RL 4.50 m:** The 20% AEP flood level would begin to encroach on the Left Bank Road intersection to the south of the site.
- **RL 7.00 m:** Access along Plover Parkway to the north is inundated by the 10% AEP flood. The low-level bridge on Coral Avenue would be cut earlier by minor flooding.
- **1% AEP:** The 2022 Mullumbimby flood at the subject site is estimated by BSC to have peaked at approximately 5.64m AHD which corresponds to a 100-year ARI flood.

The 100-year flood event at Mullumbimby peaked at approximately RL 4.98 m, which is just below the 1% AEP flood level of RL 5.01 m within the Mullumbimby CBD. At this level, the Mullumbimby East evacuation route may be closed at the intersection of Dalley Street and Queen Street.

Existing ground levels at the end of proposed Road 2 range from approximately RL 5.0 m to RL 6.0 m. Detailed design of the proposed cul-de-sac will ensure that conceptual Lots T1 & T2, will have flood-free access during a 1% AEP flood event. All remaining allotments and the proposed medium density lot will have access flood free access during a PMF event from Tuckeroo Avenue.

4) Consideration of available flood warning and evacuation time

The 2022 Mullumbimby flood was broadly equivalent to a 1% AEP flood event. Since this event, Byron Shire Council has implemented several enhanced flood monitoring, warning and emergency management systems, including:

- **Mullumbimby Road Flood Camera:** A flood monitoring camera has been installed on Mullumbimby Road at the Gulgan Road intersection. The camera provides updates approximately every 15 minutes, allowing residents to monitor road conditions and assess available access and egress routes before travelling.
- **Hinterland and Surrounding Road Cameras:** Additional cameras monitor key arterial roads surrounding Mullumbimby, including Left Bank Road, Main Arm Road and Myocum Road. These routes are important in assessing the potential for Mullumbimby to become isolated during flood events.
- **Integrated Emergency Dashboard:** Byron Shire Council's Emergency Dashboard provides a centralised public information portal incorporating live flood monitoring data and camera feeds, together with Bureau of Meteorology (BOM) warnings and information regarding road closures.

The available evacuation time during a major flood event in Mullumbimby can vary significantly depending on the nature and severity of the event. Flooding can develop rapidly, with NSW SES advice indicating that warning times for major events may be less than six hours. Mullumbimby is typically isolated when key access routes, including Gulgan Road and Jubilee Avenue (approximately RL 3.91 m), become inundated.

Where major flooding or severe weather events such as cyclones threaten the area, the NSW SES may issue targeted Evacuation Orders identifying the required evacuation area and timeframe for residents to leave.

While the proposed development may become isolated during a major flood event, the proposed dwellings will be located at or above the applicable Flood Planning Level (FPL), which is proposed to be set at 500 mm above the 1% AEP flood level. This provides for the dwellings to remain above the design flood level even where surrounding access routes become inundated.

5) Advice demonstrating whether the proposed residential rezoning can provide an acceptable risk-to-life and evacuation outcome having regard to flooding up to the PMF

All proposed future dwellings would be located at least 500 mm above the 1% AEP flood level. Only a small section of the site, located in the south-western corner, is identified as being affected by the PMF event (refer Figure 1). All proposed lots would have flood-free access during the 1% AEP event via the proposed road network to Tuckeroo Avenue, which is located well above the PMF flood level.

As a High Flood Island (HFI), the site may become surrounded by floodwaters during a major flood event, with surrounding road connections inundated and evacuation no longer possible once access routes are cut. Notwithstanding this, the risk to life is low, given that future dwellings will be located above the applicable Flood Planning Level. Prolonged isolation may, however, result in a need for resupply by boat or air.

During the 2022 flood event, Mullumbimby was isolated for approximately three days, with power and telecommunications services generally taking four to five days to be restored.



Based on the modelled flood levels applicable to the conceptual subdivision layout, it is considered that the proposed rezoning can achieve an acceptable risk-to-life and evacuation outcome for flood events up to and including the Probable Maximum Flood (PMF).

Should you have any further questions, or require additional information, please contact me on 0431 065 645 or by email at wade@civiltech.net.au

Yours faithfully

CivilTech Consulting Engineers

A handwritten signature in black ink that reads "Wade Fletcher". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Wade Fletcher – Civil Engineer

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