LOGAN RATEPAYERS ASSOCIATION Inc.

19th May 2026

To whom it may concern,

The Logan Ratepayers Association has been diligently working with the community and industry professionals to better understand the Temporary Local Planning Instruments and Logan Draft Planning Scheme amendments that are significantly impacting residents. These changes are creating serious financial consequences and development restrictions for property owners, with no clear relief, compensation, or practical support being offered to affected residents. This summary has been prepared to outline the key issues, concerns, and impacts being raised by the community.

Logan City Council has inflated the mapped flood risk applied to the community to justify the use of a TLPI, after failing to follow the proper process required to lawfully introduce flood risk mapping into the planning scheme. Instead of ensuring the mapping was transparently reviewed, properly adopted and tested through the required planning process, Council introduced a new two-step approval process for flood studies, effectively removing councillors and the community from meaningful involvement in future flood mapping decisions.

This process was rushed and has had serious consequences. Non-legislative flood maps were uploaded to PD Hub, used to inform planning decisions, and communicated to the community as though the new flood studies would determine development outcomes, despite the maps not yet having proper statutory effect. When this became apparent, Council moved quickly to introduce a TLPI after it became clear the maps and defined flood levels could not be reliably upheld, including in circumstances where development refusals were being challenged in the Planning and Environment Court.

The TLPI was not based on a clear, transparent assessment of current or near-future flood risk to the community. The flood mapping relies on incomplete and outdated infrastructure data, including stormwater and drainage information, and does not clearly demonstrate that the most current as-constructed bridge, culvert and trunk drainage information was used. Most significantly, all AEP flood maps have been modelled using ultimate development assumptions, yet this is not clearly disclosed to residents, developers or affected property owners.

These ultimate development assumptions are not minor technical inputs. They apply major future growth, increased impervious areas, altered runoff, roughness and waterway assumptions across the LGA and across flood studies, forming the basis for the Flood Hazard Overlay Map OM-05.04. As a result, the TLPI is applying flood risk controls today using modelling that reflects a heavily amplified future-development scenario, not clearly separated from present-day conditions.

Council is also financially benefiting from the system it has created, because affected residents and developers are required to pay for flood modelling and flood risk assessments to respond to development controls created by these maps. This raises serious concerns about transparency, procedural fairness and whether the flood risk now being imposed on the community has been properly justified.

Summary of concerns:

- Logan City Council has provided incomplete and conflicting information about what the flood maps represent. The future climate explanation implies flood increases are due to RCP 4.5 climate change, without disclosing ultimate development assumptions. The current climate explanation also fails to mention ultimate development or increased modelling assumptions, yet suggests the map may be used for insurance, while another Council page states the current climate map is not used by insurers.

- Logan City Council has modelled all AEP flood maps using ultimate development assumptions and amplified hydraulic inputs across both current and future climate scenarios, including future runoff from Gold Coast and Scenic Rim catchments. This means the maps are not based on current real-world conditions, yet they are being relied on today by residents, insurers and decision-makers. Council has not clearly disclosed this in its public risk mapping material, nor explained that increased impervious surfaces, altered roughness values and future runoff assumptions can expand flood levels and mapped extents, while the supporting trunk drainage and mitigation infrastructure required for that level of development is not fully reflected.

- The Logan and Albert River study has been used as a pilot, with its modelling assumptions now being applied to other flood studies, including Quinzeh Creek. This means inflated baseline assumptions, such as ultimate development land use, are being used in current climate mapping across Logan before climate change factors are even added. This risks artificially expanding both current and future flood maps, especially where future drainage, detention, levees and mitigation works have not been fully included. The concern is even greater because the new two-step approval process removes meaningful councillor input and voting on flood studies that directly affect residents, insurance, planning controls and property values.

- Ultimate development assumptions are not minor modelling adjustments. Logan’s “current climate” flood maps are based on a future scenario where dwellings increase by approximately 166% and non-residential floor space increases by approximately 282%, meaning the model assumes almost 2.6 times more homes and almost 4 times more commercial, industrial and urban floor space across the catchment.

- That level of future urbanisation substantially increases runoff, flood depth and velocity, which directly expands flood extents and increases risk classifications being applied to properties today. Yet residents were not clearly told that the maps labelled as “current climate” were built on maximum future development assumptions, despite the serious impacts on property values, development rights, insurance costs and community trust.

- The FAAR is not fit for purpose because it was based on a risk matrix that Council did not ultimately adopt. Council then created and applied a different matrix, meaning the FAAR does not assess or justify the method now being used to map properties for the Logan Plan 2025 or TLPI 2024. This matrix significantly increases the number of properties shown as affected. At the same time, the current climate maps are based on ultimate development assumptions, not just present-day catchment conditions, which increases runoff, flood depth and velocity and can push more properties into the 5% AEP extent or higher risk categories. Residents are therefore being shown current flood risk based on a future-development model and a risk matrix that was not properly assessed in the FAAR, meaning Council has not properly justified the risk now being applied to homes, land, insurance and planning controls.

- Logan City Council has diverted from Queensland Government guidance, which recommends clear community flood awareness maps showing flood depth, historical flood extent and local reference points in a simple educational format. Instead of giving residents a transparent awareness tool, Council has produced a broad “flood risk” map that combines PMF floodplain extent, hydraulic risk and planning controls into one simplified public map. This blurs the line between actual flood behaviour, theoretical floodplain extent and regulatory planning impacts. Unlike Gold Coast City Council, which separates community awareness mapping from flood risk and planning overlays, Logan has presented a combined map as the “latest flood risk information.” This is misleading because the map does not clearly disclose that the current climate scenario is based on ultimate development assumptions across the catchment, not current real-world conditions.

- Council’s public risk fact sheet does not present the flood risk definitions in the same way as the TLPI document that is actually used for planning decisions. In the public material, the risk characteristics are split across pages and shown as separate dot points, while the TLPI uses the word “or”, which materially changes the meaning of the criteria. This is not a minor wording issue, because the TLPI wording means a property can be classified as high risk based on one trigger alone, such as frequency, even if floodwater is not deep or fast flowing. By omitting or obscuring this structure in the community fact sheet, residents and developers are not being clearly told how their property can be captured in a higher risk category. The issue is made worse because the full TLPI matrix also applies climate change to many AEP events, yet this is not clearly explained in the public-facing characteristics. As a result, the community is being given a simplified explanation that does not accurately reflect the criteria being used to make planning decisions about their land. It also does not comply with the state government guidance of a risk matrix which is frequency x risk.

- Logan’s risk matrix is classifying properties as high flood risk even where the actual modelled hazard is extremely low, including cases where overland flow shows a depth of 0.0 metres or as little as 1 mm of water under a 5% AEP plus climate change scenario. This is made worse because the current climate map is based on ultimate development assumptions, increased impervious surfaces, altered roughness and waterway assumptions, without the full future trunk infrastructure and mitigation works that would support that level of development. These classifications directly affect how insurers, buyers and residents perceive risk, contributing to inflated insurance concerns, property impacts and significant community stress. Logan’s hazard and risk matrix needs to be rectified because the current approach is overstating mapped flood risk and applying future-development risk to properties as though it reflects present-day conditions.

- The flood studies were not prepared using a complete, fully current or fully verified data set, with key inputs such as stormwater infrastructure, culverts, drainage details and bridge information relying on older model data or incomplete records. Where information was missing or inconsistent, assumptions and model adjustments were used, and broader in-person inspections were limited due to time and budget constraints. This is a serious concern because flood mapping relies on accurate ground levels, drainage structures, bridge openings and local flow paths. Flood studies should also include meaningful community and local councillor input, because residents hold real lived experience of historical flooding and where modelling may not match actual events. Moving acceptance of flood studies into an officer-led process reduces that scrutiny, despite Logan receiving the largest number of submissions in Council's history and Council acknowledging that many submissions raised concerns about the flood maps.

Complete lack of transparency and conflicting information from Logan City Council

- The explanation for the future climate scenario maps does not include any reference to ultimate development simply implying CRP 4.5 is the only reason for the increase to flood affected areas.
- The explanation for current climate scenario maps does not include any reference to ultimate development. It indicates the map can be used for insurance purposes.
- However on Logan councils Planning and Building Flood map page, it states the current climate map is not used by insurers.

Which parts of my property may be affected in a future flood?

On the Key Maps tab, use the Future Climate Scenarios map to see the modelled extent of flooding (flood affected areas) in different sized floods under future climate conditions. This modelling takes into account the impacts of climate change, which is a requirement from the Queensland Government for natural hazard management. Council decided in early 2022 to use the Representative Concentration Pathway (RCP) 4.5 in our flood modelling. This is on the lower end of the range recommended by industry technical guidelines.

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The Future Climate Scenarios map is also available for your property on the Property Flood Report.

The Current Climate Scenarios map provides the same information for modelled flood events under present day (current) climate conditions (i.e. no climate change). This map can be used for insurance purposes.

What happened to the 'insurance' map on the Logan Flood Portal?

The map is still available on the Logan Flood Portal. It was renamed from 'insurance' to 'current climate' to avoid confusion about its purpose. This map is not used by insurers.

Insurers are interested in current risk (for the next 12 months or policy period) and do not consider risk under projected future climate scenarios. You can view mapping for current climate flood scenarios, based on the latest accepted flood studies in the City of Logan, in the Logan Flood Portal. We provide this information to help you understand your flood risk so that you can seek the appropriate level of insurance and make decisions which are right for you. The resources listed below may be helpful.

No reference to ultimate development or any increased assumptions (roughness of land and waterways, tailwater, blockages) due to this.

Does the map show different sized floods?

The previous flood hazard mapping in Logan Planning Scheme 2015 showed the predicted extent of a flood that has a 1% (1 in 100) chance of happening in any given year. The new risk-based flood maps which came into effect in late 2023 show flood risk, not flood events, based on both the chance of flooding and the resulting flood behaviour. They are derived from flood studies which consider a range of different flood events/sizes from a likely flood (50% chance per year) to an extremely rare flood (0.05% chance per year) to the Probable Maximum Flood (PMF) which represents the full extent of the floodplain.

These maps present a more comprehensive model and understanding of flood risk. This includes areas impacted by high flow, areas of isolation and areas where there is not enough information to determine the risk and further investigation is required.

The flood study maps are available in the Logan Flood Portal.

- Logan City Council's public material does not meet that standard for residents and developers to identify what data, studies and assumptions were used to create the mapped floodplain extent.

- Queensland State Government guidance for flood mapping expects flood information to be clear, transparent, fit for purpose and understandable for the community. The PMF footprint appears to be based on an overland flow study completed in 2020 using 2017 LiDAR data. This means the mapped extent may reflect ground conditions and trunk infrastructure from that time, with later climate change assumptions applied over the top. Council has not clearly explained this in the flood portal or supporting public documentation.

- Council has also not clearly disclosed how individual flood studies were combined, whether assumptions were adjusted between studies, or whether allowances were made to smooth discrepancies. This is not consistent with the level of transparency expected for Queensland flood mapping, particularly where the maps are being used for planning controls, insurance concern, property impacts and emergency management.

- Logan City Council has failed to clearly address the two most critical issues: the use of ultimate development assumptions and the method used to develop the overall floodplain extent. Without this information, the mapping cannot be properly understood, tested or relied upon by the community.

4.8.1 Mapping

Internal Council review has suggested using overland flow mapping as the best available option to define the interim extent of flood prone areas in these catchments. This mapping was based on hydraulic modelling for the entire LGA. It was completed in 2020 and based on 2017 LIDAR. It does not address climate change but provides an approximation of events up to a PMF. The alternative would be to use the current planning scheme flood hazard overlay, which reflects a previously modelled 1% event and also does not consider climate change.

Ideally, the data on which the mapping is based would enable the determination of a flood level, which could be used to establish floor level requirements, which is discussed further below.

Recommendations

- Overall, the choice of interim mapping should be based on the best available data, providing the closest approximation of at-risk areas and providing an ability to establish depth for the purposes of identifying a DFL (see other options below).

- Whichever mapping is used, identify clearly what that mapping represents (in terms of events and modelling sources etc) so that it can be readily understood and scrutinised in the

All AEP flood maps have been modelled using ultimate development assumptions and other amplified hydraulic inputs applied across both the current and future climate scenarios. This has significantly inflated the current flood maps relied upon by insurers, contributing to substantial increases in insurance costs and, in some cases, the loss of insurance coverage altogether.

- Logan City Council has dramatically inflated flood risk mapping by applying ultimate development land use assumptions across all flood modelled scenarios, including runoff entering the model from both Gold Coast City Council and Scenic Rim Regional Council areas also assumed to be at ultimate development. This means the modelling is based on a maximum future urbanisation scenario across the entire catchment, not current real world conditions. Even historical flood events were calibrated using current aerial imagery and altered catchment assumptions, which further inflated historical model outputs.

- Despite this, Council's public Risk Mapping fact sheets contain no clear disclosure that ultimate development assumptions and amplified hydraulic inputs were used to generate the flood maps. There is no transparency provided to residents that increased impervious surfaces, altered roughness values and future runoff assumptions have significantly increased the flood levels and map extents shown today. At the same time, the modelling does not fully include the major trunk drainage infrastructure, detention basins, levees and mitigation works that would be required to support this level of future development, resulting in flood maps that substantially overstate current flood behaviour and risk.

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4 Hydrologic model development

4.1 OVERVIEW

An XP-RAFTS runoff routing model (Innovyze, 2019) was developed for the Logan and Albert Rivers catchment to its outlet at Moreton Bay. The XP-RAFTS hydrologic model was calibrated against the January 1974, April 1990, January 2013 and March 2017 flood events. XP-RAFTS models was developed for the following scenarios:

- **Existing catchment conditions** - Model parameters based on existing development within the catchment. This model was used for model calibration to historical events.
- **Ultimate catchment conditions** - model parameters were based on ultimate development of the catchment in accordance with the current Council planning schemes. This model is used for design event modelling.

The XP-RAFTS hydrologic model was calibrated to the January 1974, April 1990, January 2013 and March 2017 flood events. Details of the XP-RAFTS model calibration methodology and results are described in Section 5 of this report. The proposed methodology for the use of the calibrated XP-RAFTS models to estimate design discharges is described in Section 8 of this report.

11.5 DESIGN FLOOD DISCHARGES

The calibrated XP-RAFTS model was used to estimate design flood discharges throughout the Logan and Albert rivers catchment in accordance with the AR&R 2019 guidelines. The

XP-RAFTS model design event discharges were reconciled against FFA estimates at the four gauging stations within the Logan and Albert rivers catchment.

Design flood discharge hydrographs were estimated for the full range of storm durations for the 50% (1 in 2), 20% (1 in 5), 10% (1 in 10), 5% (1 in 20), 2% (1 in 50), 1% (1 in 100), 0.5% (1 in 200), 0.2% (1 in 500), 0.05% (1 in 2,000) AEP events and the PMPDF event.

Subcatchment parameters (fraction impervious and Manning's n) for the XP-RAFTS model for design events were derived based ultimate catchment conditions (based landuses identified in the LCC, GCCC and SRRC planning schemes).

Design flood discharges were also estimated for the future climate scenario based on RCP 4.5 for the 2090 climate horizon. An increase in rainfall intensity of 9.5% is predicted for the future climate scenario

- For the existing catchment conditions XP-RAFTS model, land-use types were determined based on Google Earth aerial photographs.
- For the ultimate conditions catchment conditions XP-RAFTS model, land-use types were be determined based on the current LCC, Scenic Rim Regional Council (SRRC) and Gold Coast City Council (GCC) planning schemes

Modelling assumptions are not limited to the Logan and Albert River study and are now being applied to other flood studies, including the Quinzeh Creek study, indicating the Logan and Albert River study was treated as a pilot project with its methodology and assumptions being rolled out across the entire Logan LGA.

- Inflated modelling assumptions have been prescribed for use across Logan flood studies, including ultimate development land use conditions being applied to current climate mapping.
- This means future flood studies across Logan may continue using amplified baseline assumptions before any additional climate change factors are even applied.
- As a result, both current and future climate flood maps risk being artificially expanded from the outset.
- This issue is further compounded because the modelling does not fully include the additional stormwater infrastructure, detention basins, levees and mitigation works that would normally be required to support that level of future development.
- The new two-step process for approving flood studies also appears to remove councillor involvement from the acceptance of those studies.
- This means local divisional councillors may have no opportunity to provide input based on their area's historical flood experience.
- It also means councillors may not be required to vote on whether flood studies are accepted, despite the significant impacts these studies can have on residents, planning, insurance and property values.
- This was not made abundantly clear when the new two-stage process was quickly put to Council for approval.

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4.6 Catchment Land Use

In accordance with the project briefing requirements, the catchment land use scenario considered for the design flood estimates represents a fully developed catchment scenario in accordance with Council's ultimate land use intent as articulated in the current Planning Scheme. This decision was also guided by the sensitivity undertaken in Section 4.3. As such, catchment land use for application in the XP-RAFTS models was determined in accordance with the planning scheme land use designation for which fraction impervious values in accordance with Section 4.05 of the Queensland Urban Drainage Manual (QUDM) were applied. Each of the sub-catchments in the XP-RAFTS model was determined based on the planning scheme zone classifications, with the overall percentage imperviousness for each sub-catchment prepared based on a spatially area averaged basis. The land use classifications were informed by the Zoning layer provided by the

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Quinzeh Creek Flood Study 2023 Page 30

Ultimate development assumptions are not minor adjustments. Logan's current flood map reflects modelling based on a 166% increase in dwellings and a 282% increase in non-residential floor space, yet this is not clearly disclosed to residents using the maps today.

- The flood modelling applied across Logan is based on ultimate development assumptions that dramatically increase future dwellings, commercial floor space and urban development across the catchment. These are not small changes. The modelling effectively assumes a fully built out future city, which substantially increases runoff, flood depth and water velocity across both the current and future climate maps.

- This has directly expanded flood extents and increased flood risk classifications across Logan, impacting development approvals, reducing land value and driving major increases in insurance costs, including loss of insurance coverage for some residents.

- Despite the significant impact these assumptions have on the flood maps, Council did not clearly disclose to the community that the "current climate" maps were based on maximum future development scenarios combined with additional hydraulic and climate assumptions. The community was therefore never properly informed about the true methodology behind the new flood maps or given a genuine opportunity during the TLPI or Logan Plan consultation process to understand and challenge the assumptions driving these outcomes.

Existing and projected dwellings

				2026			UD
Logan City	Retail	1,581,728	1,793,916	1,823,163	1,936,908	2,014,830	6,479,505
	Commercial	328,754	384,593	428,205	477,493	532,662	1,878,605
	Industrial	2,254,636	2,361,256	2,717,289	3,065,732	3,412,986	8,152,937
	Community purpose	947,037	1,063,305	1,218,485	1,354,023	1,521,920	3,239,922
	Other	167,723	167,800	172,692	173,077	180,911	411,070
	Total	**5,279,878**	**5,770,870**	**6,359,832**	**7,007,234**	**7,663,309**	**20,162,040**

Existing and projected non -residential floor space

				2026			UD
	Total	**84,095**	**90,729**	**119,807**	**149,008**	**201,243**	**456,512**
Logan City	Detached dwelling	299,955	307,326	345,675	394,668	460,608	743,616
	Semi-detached dwelling	32,227	36,745	41,171	45,824	48,487	72,963
	Attached dwelling	1,315	3,042	3,953	7,065	9,472	72,202
	Other dwelling	636	979	1,297	1,297	1,297	1,286
	Retirement village	8,228	8,929	9,454	10,086	10,642	18,015
	Non-private	2,079	2,342	2,841	2,984	2,984	2,976
	Total	**344,440**	**359,364**	**404,392**	**461,924**	**533,489**	**911,059**

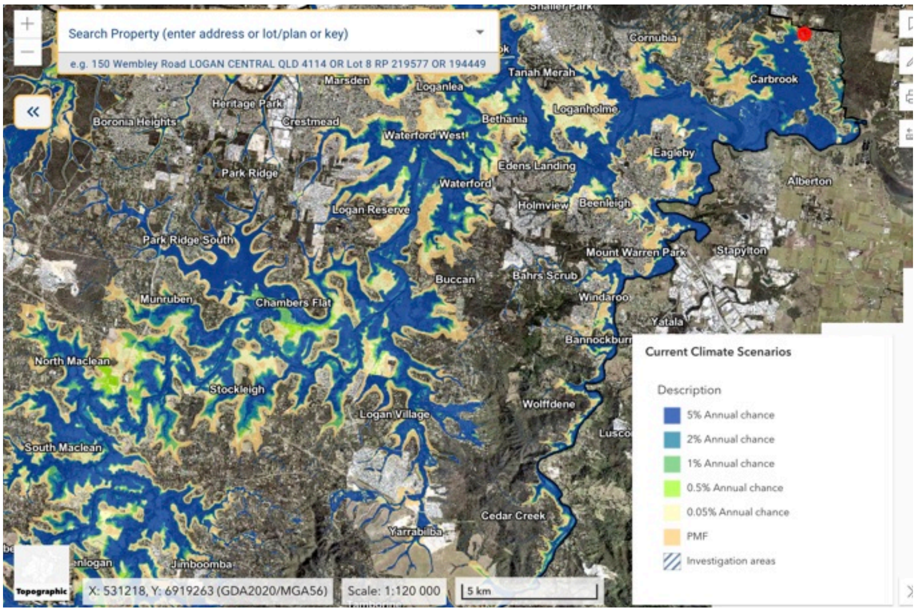
- Based on the figures shown in the modelling assumptions:
  - Total dwellings increase from 344,440 to 911,059 under ultimate development.
  - This is an increase of approximately 166%.
  - In practical terms, the model assumes Logan will have almost 2.6 times more dwellings than current levels.
  - Total non residential floor space increases from 5,279,878 to 20,162,040.
  - This is an increase of approximately 282%.
  - In practical terms, the model assumes almost 4 times more commercial, industrial and urban floor space across the catchment.

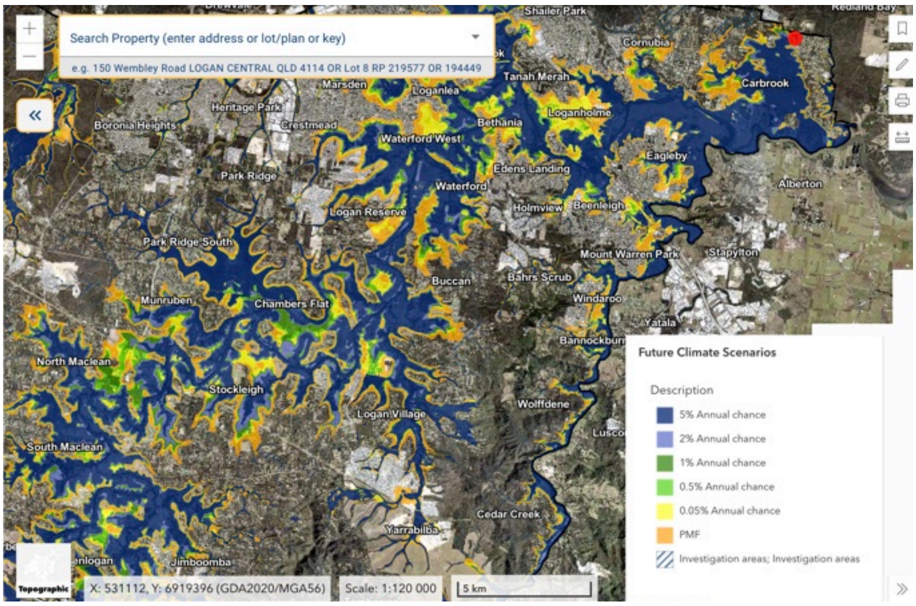
Logan's "current climate" modelling was also based on ultimate development assumptions across the catchment, including increased impervious surfaces and altered runoff behaviour.

This means the baseline current climate mapping was already significantly amplified before the additional 2090 climate change rainfall increase was applied. At the same time, future mitigation infrastructure and trunk drainage works were not fully included, resulting in modelling that overstates present day flood behaviour while compounding future climate assumptions on top of future development assumptions.

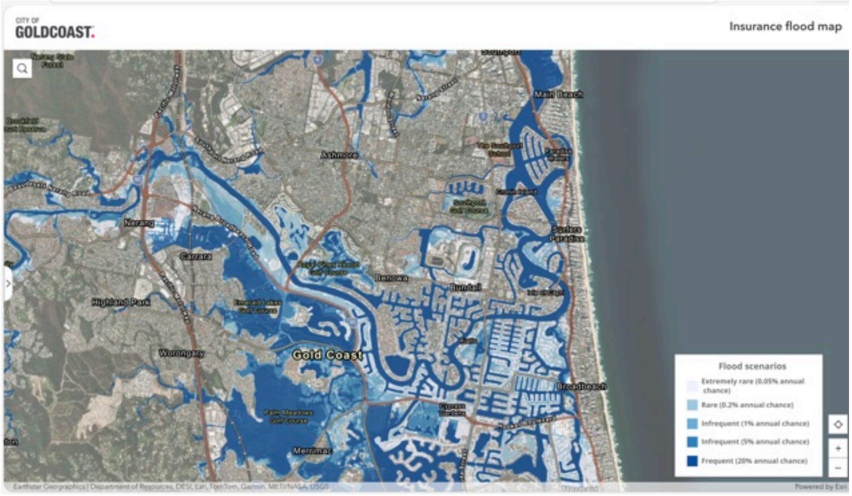
Given Logan is one of the fastest growing councils in Queensland, applying maximum ultimate development assumptions across the entire catchment to current climate flood mapping is not appropriate, as the actual urban form, supporting infrastructure and mitigation works will evolve progressively over many decades rather than existing simultaneously today.

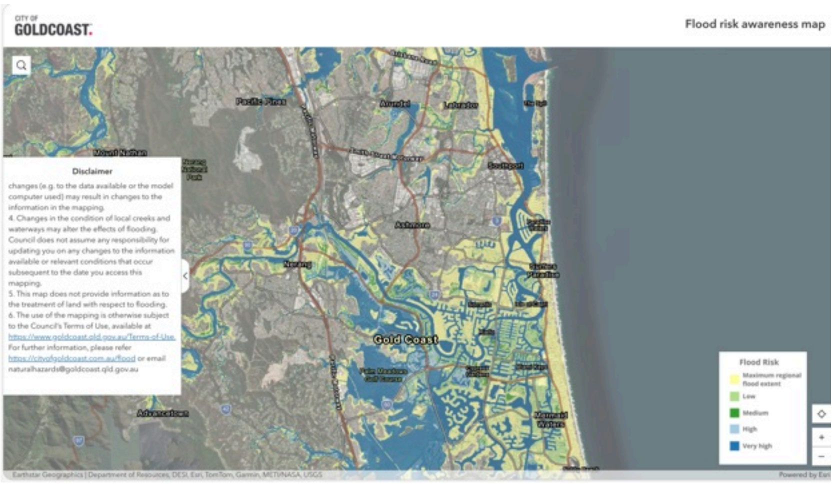
Logan's current and future flood maps are the same size.





Gold Cost future flood scenario map that is used for insurance is smaller than their flood risk map as they have not used ultimate development in their modelling.





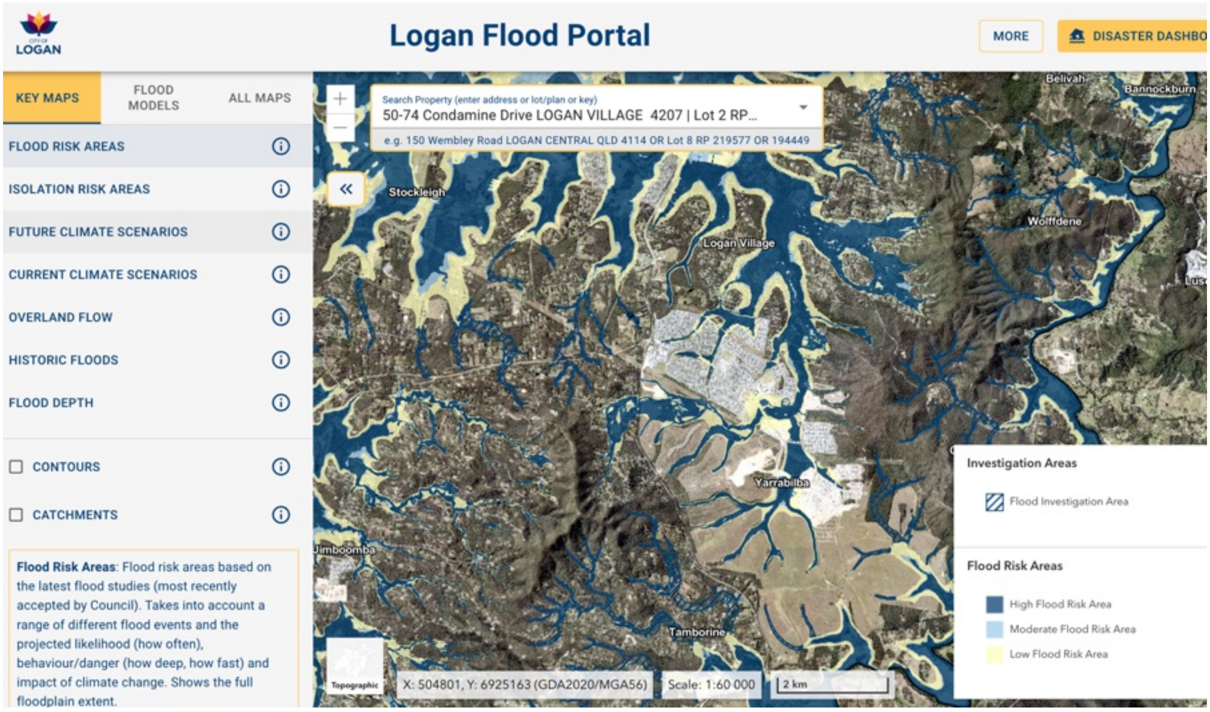
Logan city council has applied an increase of 0.8m sea level rise across the catchment without any variation further away from the river mouth

- The future climate modelling applied an additional 0.8 metre sea level rise at the mouth of the Logan River and carried those higher water levels upstream through the hydraulic model.
- While sea level rise sensitivity testing is standard practice, a 0.8 metre increase at the river mouth does not mean flood levels increase by 0.8 metres throughout inland areas such as Jimboomba and Logan Village. Flood behaviour changes significantly throughout a catchment depending on local topography, storage, drainage and flow conditions.
- Applying elevated downstream tailwater conditions across the broader river system substantially increases flood levels and flood extents within the model, particularly when combined with ultimate development runoff assumptions and without fully incorporating future mitigation infrastructure.
- Despite the future climate model applying an additional 0.8 metre sea level rise, the current climate and future climate flood maps have almost identical footprints. This demonstrates that climate change is not the primary reason for the significantly expanded flood mapping across Logan.
- The main driver of the enlarged flood footprint is the modelling methodology itself, including ultimate development assumptions, increased impervious surfaces, altered roughness values and other compounded hydraulic inputs applied across the catchment.
- In practical terms, the “current climate” flood maps have already been heavily inflated by modelling assumptions before future climate change impacts are even added.

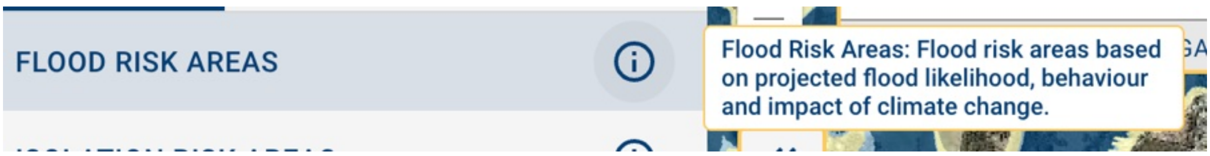
The mean high water springs (MHWS) tide level was obtained from Department of Transport and Road (TMR) Queensland Tide Tables (TMR, 2020), and was adjusted by 0.8m to account for sea level rise in the 2090 future climate scenario.

Logan’s flood portal presents the flood risk mapping as representing current flood risk, without clearly disclosing that the maps are based on ultimate development assumptions and amplified modelling inputs.

- The portal fails to disclose that the modelling applies the runoff impacts of ultimate development, but does not fully include the future trunk drainage, stormwater infrastructure and mitigation systems required to manage that same level of development. This means the maps show the additional water generated by future urban growth without properly accounting for the infrastructure that would be needed to drain, detain or reduce it.



- Hovering over “Flood Risk Areas” does not explain that properties can be classified based on flood likelihood alone, or through the cumulative effect of combined modelling inputs such as depth, velocity and hazard categories. It also does not disclose the use of ultimate development assumptions, how the PMF flood extent was derived, or which AEP event scenarios underpin the mapping shown.



Logan's current flood map should clearly represent present-day flood behaviour, because it is being used for community awareness, planning decisions and emergency management responses.

- Instead, the modelling includes inflated storm surge conditions layered over an ultimate development scenario, where the catchment is assumed to be significantly more urbanised than it is today.
- This is further compounded by increased roughness and runoff assumptions, without clearly accounting for the future trunk drainage and stormwater infrastructure that would be required to manage that level of development.
- These combined assumptions artificially expand the current flood extent and risk footprint, rather than showing a clear present-day flood risk.
- Because the climate change map builds on the current map, any inflation in the current scenario is then carried forward and further amplified in the future climate mapping.
- This makes the current map misleading for residents and not fit for purpose for emergency management, because it does not clearly separate today's real-world flood risk from theoretical future development and inflated boundary conditions.

Table 10.3 - Adopted tailwater conditions for future climate (2090) design events

Design event	Adopted tailwater level (mAHD)	Time varying and peaks with flood?	Tailwater conditions
Base case scenarios			
20% AEP	1.79	No	MHWS
10% AEP	1.79	No	MHWS
5% AEP	1.79	No	MHWS
2% AEP	2.76	Yes	5% Storm surge
1% AEP	2.76	Yes	5% Storm surge
0.5% AEP	2.76	Yes	5% Storm surge
0.2% AEP	2.76	Yes	5% Storm surge

Table 10.2 - Adopted tailwater conditions for current climate (2020) design events

Design event	Adopted tailwater level (mAHD)	Time varying and peaks with flood?	Tailwater conditions
Base case scenarios			
50% AEP	0.99	No	MHWS - static
20% AEP	0.99	No	MHWS - static
10% AEP	0.99	No	MHWS - static
5% AEP	0.99	No	MHWS - static
2% AEP	1.88	Yes	5% Storm surge
1% AEP	1.88	Yes	5% Storm surge
0.5% AEP	1.88	Yes	5% Storm surge
0.2% AEP	1.88	Yes	5% Storm surge
0.05% AEP	1.88	Yes	5% Storm surge
PMPDF	2.07	Yes	1% Storm surge
Sensitivity scenarios			
5% AEP + 1% Storm Surge	2.07	Yes	1% Storm surge
1% AEP + No Blockage	1.88	Yes	5% Storm surge

The current climate and future climate 5% AEP storm surge levels for Rocky Point (in the marine channel at the mouth of the Logan River) reported in the Gold Coast City Council Storm Tide Study Final Report Addendum (GHD, 2013) were adopted for the study, and applied as the peak level for the storm surge tidal sequence applied at the downstream boundary of the model. This is consistent with the approach adopted for recent City of Gold Coast modelling of the Logan River and Woongoolba floodplain.

The risk matrix selected as the basis for the FAAR was not the adopted risk matrix from any of the options recommended by the flood reporting consultants. Its use significantly expands the number of properties mapped as being subject to flood risk.

- Logan's flood risk matrix goes further than neighbouring councils by treating extremely rare, low-hazard flooding as active flood risk land, including areas only affected in a PMF and where water may be shallow or slow moving.
- It also captures "high island" areas, meaning properties can be mapped as flood impacted even when water does not reach the dwelling, simply because surrounding roads or land may become isolated.
- This significantly expands the number of properties shown as flood affected, blurring the line between genuine flood hazard and broader theoretical floodplain extent.
- The impact is amplified because Logan's current and future climate maps are based on "ultimate development" assumptions, meaning the catchment is modelled as if it is fully built out with far more roads, roofs, hard surfaces and runoff.
- As flood risk is calculated using depth and velocity, those future development assumptions can directly increase the mapped level of risk being applied to properties today.
- The result is that residents are being shown flood risk based on a theoretical future catchment, not clearly separated from current real-world conditions, with serious consequences for property perception, insurance concern, planning controls and community trust.

- Recommended options. The first option was used for the FAAR, the third option is what BMT believed would be used.

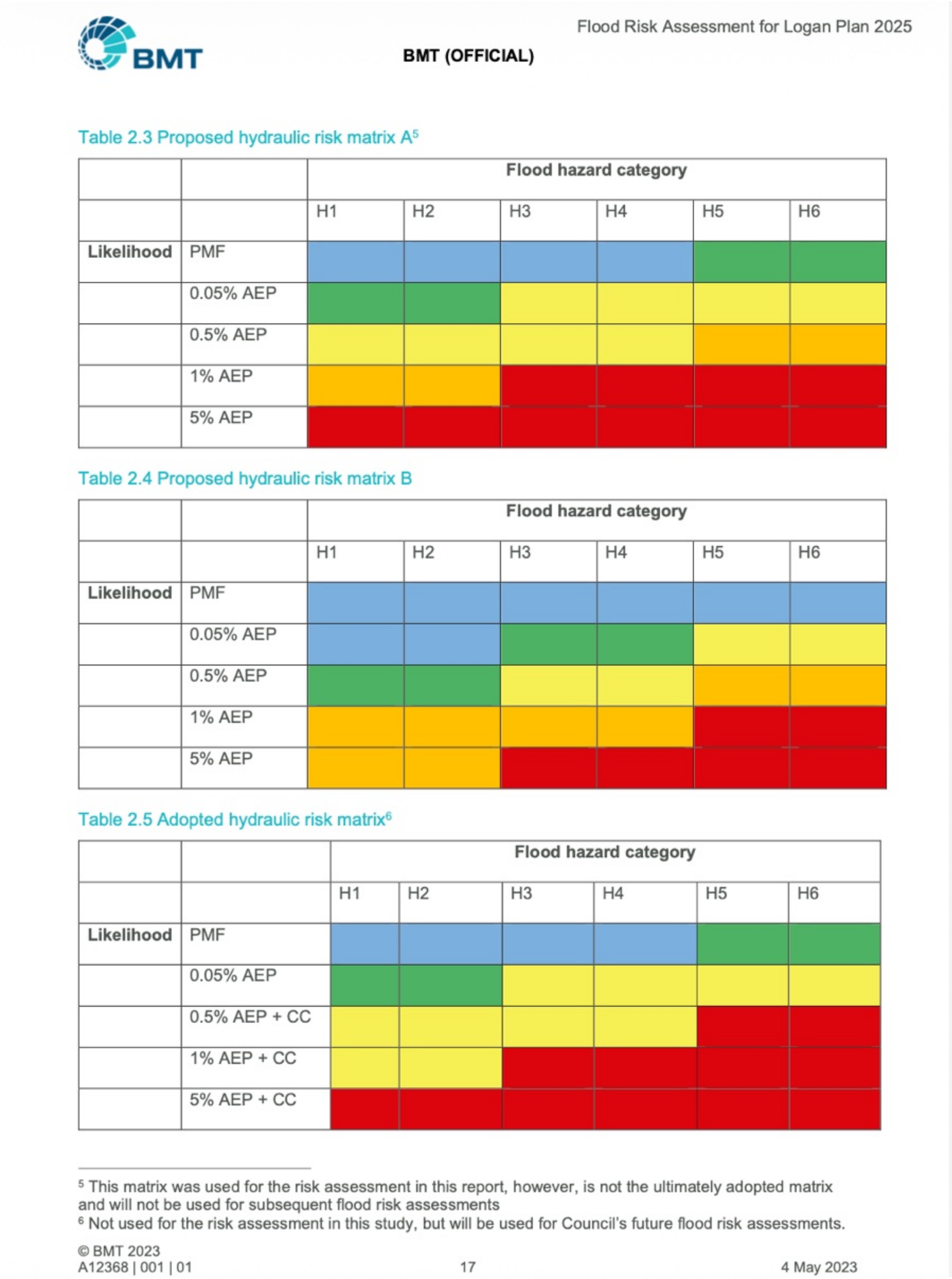


Table 2.3 Proposed hydraulic risk matrix A[5]

		Flood hazard category					
		H1	H2	H3	H4	H5	H6
Likelihood	PMF						
	0.05% AEP						
	0.5% AEP						
	1% AEP						
	5% AEP						

Table 2.4 Proposed hydraulic risk matrix B

		Flood hazard category					
		H1	H2	H3	H4	H5	H6
Likelihood	PMF						
	0.05% AEP						
	0.5% AEP						
	1% AEP						
	5% AEP						

Table 2.5 Adopted hydraulic risk matrix[6]

		Flood hazard category					
		H1	H2	H3	H4	H5	H6
Likelihood	PMF						
	0.05% AEP						
	0.5% AEP + CC						
	1% AEP + CC						
	5% AEP + CC						

[5] This matrix was used for the risk assessment in this report, however, is not the ultimately adopted matrix and will not be used for subsequent flood risk assessments

[6] Not used for the risk assessment in this study, but will be used for Council's future flood risk assessments.

- However, Council then created a separate risk matrix. This means the FAAR does not reference or assess the actual flood risk matrix Council adopted. As a result, the FAAR is not fit for purpose, and there appears to have been no independent peer review of the methodology Council ultimately applied.

Table 2 Hydraulic risk by conceptual response pathways

	Event / hazard included	Hydraulic Risk	Planning Risk	Response Pathway
	0.5% AEP- H5-6 1% AEP- H3-6 5% AEP- H1-6	High	Intolerable	Avoid / retreat / no intensification
	1% AEP – H1-2 0.05% AEP- H5-6 0.5% AEP- H1-4	Moderate	Tolerable	Mitigate / manage / adapt
	PMF- H1-6 0.05%AEP- H1-4	Low	Broadly acceptable	Mitigate / accept

Based on the descriptions of H1-H6 hydraulic hazard conditions describe in the report, Table 3 below sets out flood risk implications for each of the hydraulic risk categories used in the matrix adopted for the purposes of shaping Logan's planning response

Table 3 Hydraulic risk categories and flood risk implications

HR	Event / hazard included	Flood risk implications
High	0.5%AEP – H5-6 1% AEP- H3-6 5% AEP- H1-6	Frequently flooded by the 5% AEP event or deep and fast-moving floods in the 1% or 0.5% AEP events that could threaten structures and lives
Moderate	1% AEP – H1-2 0.05% AEP- H5-6 0.5% AEP- H1-4	Flooded up to 0.5m depth in the 1% AEP event and up to 2m in the 0.5% AEP event, or deep and fast-moving floods in the rarer 0.05% event that could threaten structures and lives
Low	PMF- H1-6 0.05%AEP- H1-4	All PMF events Shallow and slow-moving floods in the rare events
High island	NA	Flood free in PMF but surrounded by flood in events up to and including the PMF (and may experience flood related impacts, such as loss of power and water)

- Comparing Logan's matrix to Gold Coast City council, a H1 (lowest risk) with 5% chance per year of occurring is the highest risk in Logan's matrix, but medium range. In Logan's matrix, 5% is defines as frequent however Gold Coast defines 5% per year of flooding as a rare occurrence.

- It is important to remember that Logan's 5% AEP mapping is not based solely on present-day catchment conditions. It has been modelled using ultimate development assumptions, which increase hard surfaces, runoff, flood depth and velocity.

- This means the mapped 5% AEP flood extent can be pushed higher and wider than it would be under current real-world conditions, causing more properties to appear within the 5% AEP extent or higher risk categories.

- As a result, the "current climate" map is misleading because it presents future-development flood behaviour as though it reflects today's actual flood risk

Table 2-2 PHR descriptors

PHR Category	Risk Benchmark	Parameters	Rationale
HR1	Very High Risk	H5 to H6 in a 1% AEP H4 to H6 Hydraulic Hazard in a 5% AEP H3 to H6 Hydraulic Hazard in a 20% AEP	Unsafe for people and vehicles and buildings are subject to structural failure in **likely and frequent** flood events. Flood events with HR 1 are both frequent and high hazard. No areas of Low hydraulic hazard in this category.
HR2	High Risk	H6 Hydraulic Hazard in a 0.2% AEP H5 to H6 Hydraulic Hazard in a 0.5% AEP H3 to H4 Hydraulic Hazard in a 1% AEP H2 to H3 Hydraulic Hazard in a 5% AEP H1 to H2 Hydraulic Hazard in a 20% AEP	Unsafe for people and vehicles and buildings are subject to structural failure in **infrequent** flood events. Flood events with HR 2 are usually both relatively frequent and usually of high hazard.
HR3	Medium Risk	H6 Hydraulic Hazard in a 0.05% AEP H4 to H5 Hydraulic Hazard in a 0.2% AEP H3 to H4 Hydraulic Hazard in a 0.5% AEP H2 Hydraulic Hazard in a 1% AEP H1 Hydraulic Hazard in a 5% AEP	Unsafe for people and vehicles and buildings are subject to structural failure in **rare** flood events. Flood events with HR 3 can either be rare with high hazard, or relatively frequent with lower hazard.
HR4	Low risk	H3 to H5 Hydraulic Hazard in a 0.05% AEP H2 to H3 Hydraulic Hazard in a 0.2% AEP H1 to H2 Hydraulic Hazard in a 0.5% AEP H1 Hydraulic Hazard in a 1% AEP	Unsafe for people and vehicles and buildings are subject to structural failure in **very rare** flood events. Flood events with HR 4 can either be very rare with high hazard, or relatively infrequent with lower hazard.
HR5	Maximum Regional Floodplain Extent	H1 to H6 Hydraulic Hazard in a PMF H1 to H2 Hydraulic Hazard in 0.05% AEP H1 Hydraulic Hazard in a 0.2% AEP	Extent of the floodplain associated with **extremely rare** events. Includes hazard of any type (low or high).

Logan Council have also diverted from the guidance to display a community awareness to flood maps.

- The Queensland State Government guidance for community flood awareness mapping recommends simple educational maps that clearly show flood depth, historical flood extent and local reference points using graduated blue shading. The purpose is to help residents understand flooding in a clear and transparent way. Gold Coast City Council has followed a similar approach by separating community awareness mapping from flood risk and planning overlays.

- Logan City Council did not adopt this approach. Instead, council created a simplified flood risk map using broad risk categories and different colour schemes that combine PMF floodplain extent, hydraulic risk and planning controls into a single public map described as the “latest flood risk information.” The maps do not clearly explain that the current climate mapping is based on ultimate development assumptions across the catchment, not current real world conditions.

Guide for Flood Studies and Mapping in Queensland
Part 5 – Technical Guide 90

Table 5-10 Community Education and Awareness – Local Scale – Depth

Output Type	Modelled Event (s)	Suggested Inclusions	Suggested Map Style and Colour	Example
Flood Depth	Design events, extracted at regular increments and critical levels associated with the local stream gauge (if possible), else peak depth	Critical infrastructure such as hospitals, schools, airports, power stations and rail Local landmarks and reference points	0.0 – 0.5m Solid polygon RGB: 239, 243, 255	
			0.5 – 1.0m Solid polygon RGB: 189, 215, 231	
			1.0 – 1.5m Solid polygon RGB: 107, 174, 214	
			1.5 – 2.0m Solid polygon RGB: 49, 130, 189	
			More than 2.0m Solid polygon RGB: 8, 81, 156	
Extent	Nearest-sized historic event (if available)		Historic flood Line extent RGB: 255, 0, 255	

Additional notes:

Suggested transparency of flood result polygons: 30-50%

Include a figure of the local stream gauge totem.

Misleading Flood Risk Descriptions Do Not Match the TLPI Planning Definitions

- The public-facing risk matrix is not presented in the same way as the TLPI flood risk definitions that are actually used for planning decisions.

- In the community document, the risk characteristics are split across two pages and shown as separate dot points. This presentation makes each point appear cumulative or separate, rather than clearly showing the legal/planning test being applied.

- The TLPI definition uses the word “or”, which is critical. For example, land can be classified as high flood risk if floodwaters are deep or fast flowing or if there is a relatively high chance of occurrence. These are not the same meaning.

- By removing or obscuring the word “or” in the public-facing version, Council has changed how an ordinary resident would understand the risk category. It makes the criteria appear more severe and evidence-based than they may actually be.

- The same issue occurs with the low flood risk category. The public document lists “extremely unlikely chance of flooding,” “unacceptable risk for vulnerable land uses,” and “full floodplain under the largest flood” as separate dot points, but does not clearly show how these criteria relate to the TLPI wording used for planning decisions.

- Omitting the word OR is not explained as a formatting error as the inclusion of the word OR entirely changes the definition. The public risk description does not clearly match the TLPI definition that controls planning outcomes, meaning residents are being shown a version that falsely explains how risk is being classified.

- The result is a misleading public explanation of flood risk, where residents and developers are not being clearly told that properties can be captured under these categories because of one characteristic alone, including probability, isolation, shallow flooding, or PMF floodplain extent.

- Council’s public material should clearly reproduce the same wording and structure used in the TLPI, including the word “or”, so residents can understand the actual criteria being used to make planning decisions about their properties.

This is from the Logan risk fact sheet definitions. This fact sheet is used to educate the community,

Risk	Characteristics
High	• Floodwaters may be deep or fast flowing • Floods may have a relatively high chance of occurrence (for example 80% chance in 30 years) • Conditions may pose a risk to life and cause damage to buildings, possibly severe.
Moderate	• Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater • Conditions may pose an unacceptable risk to people or property if not mitigated.

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Risk	Characteristics
Low	• Extremely unlikely chance of flooding (1% chance or less over a 30 year period) and/or relatively shallow or benign flooding conditions • Poses an unacceptable risk for vulnerable land uses such as aged care or childcare • Identifies the full floodplain under the largest flood that could conceivably occur.

However the definition in the matrix in the TLPI 2024 differs to the fact sheet. It shows the words “OR” in the description for the highest flood risk. This means frequency alone can cause a property to be mapped as high risk. This has been left out of the fact sheet so it is not clear such a low % can place a property into the highest risk category, with the strict planning regulations.

4.3 Guidelines for satisfying the Flood hazard overlay code and Dual occupancy and Dwelling house code

1. Table 4.3.1 - Logan flood risk areas describes the flood risk areas defined for Logan.

Table 4.3.1 - Logan flood risk areas

Flood risk	Map format	Description of flood risk
High flood risk		Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe.
Moderate flood risk		Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if not mitigated.
Low flood risk		Extremely unlikely chance of flooding (1% chance or less over a 30 year period) and/or relatively shallow or benign flooding conditions. Identifies the full floodplain under the largest flood that could conceivably occur.

Then there is a third reference to the matrix, that actually shows the true extent which actually includes climate change to most AEP's. Again, this is not explained in the characteristics in the guidelines for satisfying the Flood hazard overlay code, or on the community flood fact sheet. It also does not comply with the state government guidance of a risk matrix which is frequency x risk.

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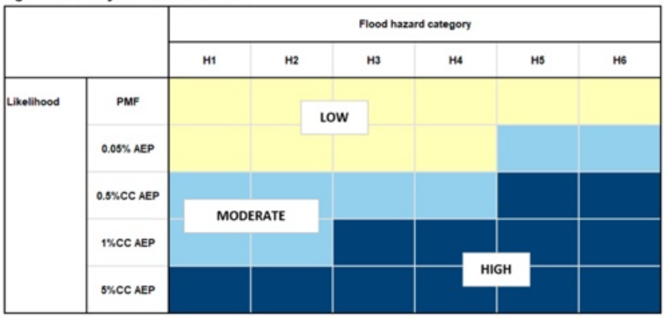
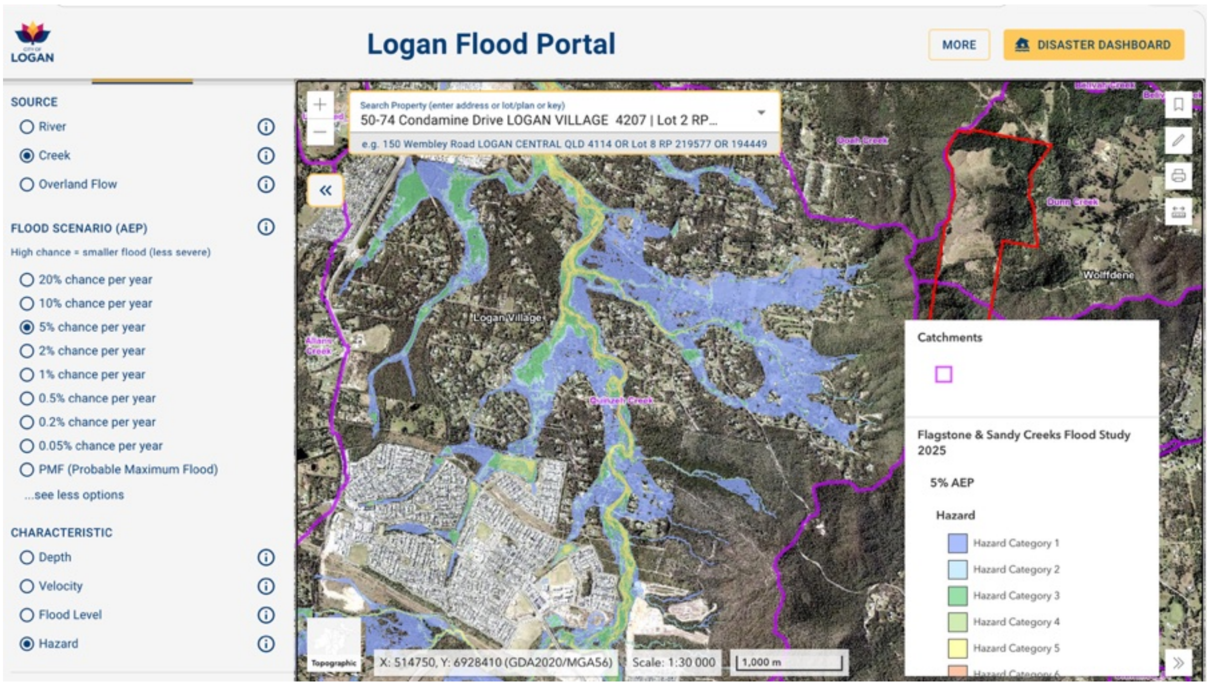
Flood risk areas

6. The Flood hazard overlay map **OM-05.04** defines areas of flood risk, being Low flood risk area, Moderate flood risk area or High flood risk area. These have been defined in accordance with the hydraulic risk matrix below in Figure 1.8.2 - Hydraulic risk matrix, in consideration of the characteristics of the Logan waterways and floodplains.

Figure 1.8.2 - Hydraulic risk matrix



To show the scale of the impact, this map identifies areas affected by any water in the 5% AEP event**.** If Logan's risk matrix was aligned more closely with Gold Coast's approach, the areas shown in purple would not be treated as the highest risk on the map, because purple represents the lowest hazard category, H1**.** This is especially important because the 5% AEP mapping itself is based on ultimate development assumptions, with no full allowance for the mitigation works, trunk drainage infrastructure, detention or other systems that would be required to support that level of development. It also applies increased roughness, impervious land factors and waterway assumptions across the LGA. On a true current-climate, present-day conditions map, the flood footprint should be smaller from the outset, meaning fewer homes should be captured before any risk classification is even applied.



The result is that a property can be mapped as the highest possible flood risk simply because it is affected by overland flow. In some cases, the modelled water depth is so shallow it displays as 0.0 metres, yet the matrix can still classify the property as high risk because there is a 5% AEP + climate change chance of at least 1 mm of water. This risk classification is then being applied based on ultimate development assumptions, not present-day conditions.

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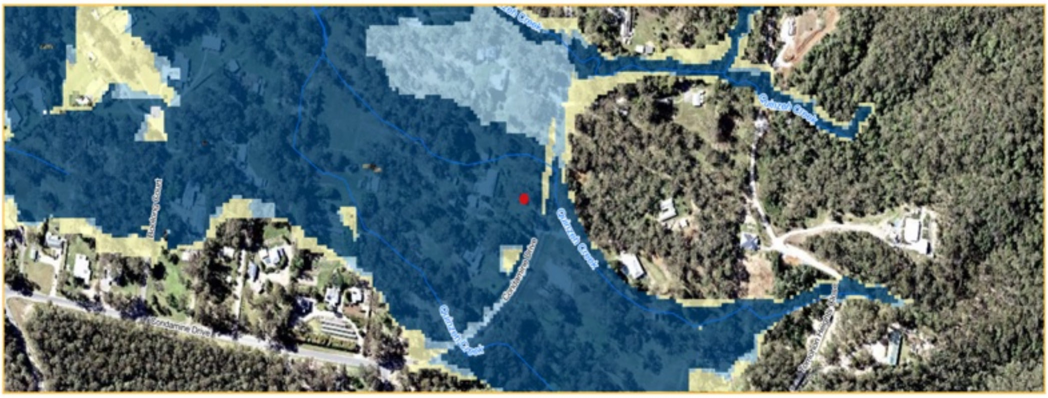
Latest Flood Risk

The extract below comes from the flood risk map based on the latest (most recent) flood studies accepted by Council applicable at the selected location.



LEGEND

High	Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe. Limited development may be considered if not increasing the flood risk exposure for people or property. These areas are generally better suited to environmental, recreational and some agricultural uses.
Moderate	Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if not mitigated. Development may be tolerable if measures are taken to address flood impacts, protect people and limit damage.
Low	Extremely unlikely chance of flooding (1% chance or less over a 30 year period) and/or relatively shallow or benign flooding conditions. Development is generally acceptable except for essential community infrastructure (e.g. emergency services). Vulnerable uses (e.g. childcare, aged care) may be ok subject to building, site access and safe shelter mitigation measures. Shows the full floodplain under the largest flood that could conceivably occur.
Investigation area	Locations where a current flood study has not been delivered and information to determine flood risk is not available. The approximation of the floodplain in these areas is based on a citywide overland flow study. Development should avoid these areas until further investigation (updated flood study or localised risk assessment) is completed

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Overland flow	Not applicable

Flood Study Data

The table(s) below display data from the flood studies applicable at the selected point.

Study: Quinzeh Creek Flood Study 2023

Likelihood (each year)	Hazard	Depth	Level	Velocity
20% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.1 metres per second
10% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
5% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
2% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
1% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
0.5% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
0.2% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
0.05% AEP	Hazard Category 1	0.0 metres	49.9 metres AHD	0.2 metres per second
PMF	Hazard Category 1	0.0 metres	49.9 metres AHD	0.4 metres per second

Term	Description
AEP	Annual Exceedance Probability, or the chance that a flood of that size or larger will occur in any given year. A low chance indicates a rare but larger flood.
Hazard	Level of danger, where 6 is highest, based on vulnerability curves considering depth and velocity presented in the Australian Institute for Disaster Resilience Handbook 7-3. • Hazard Category 1: Generally safe for vehicles, people and buildings. • Hazard Category 2: Unsafe for small vehicles. • Hazard Category 3: Unsafe for vehicles, children and the elderly. • Hazard Category 4: Unsafe for vehicles and people. • Hazard Category 5: Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.

This is not a one off event as evidenced by another property report in the same situation.

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Logan Flood Portal

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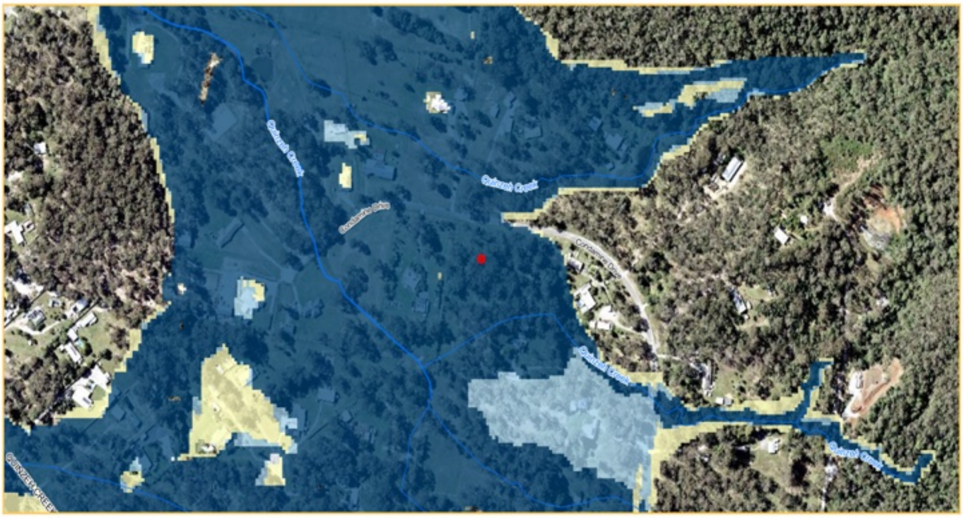
The extract below comes from the flood risk map based on the latest (most recent) flood studies accepted by Council applicable at the selected location.



LEGEND

High	Floodwaters may be deep or fast flowing, or have a relatively high chance of occurrence (e.g. 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe. Limited development may be considered if not increasing the flood risk exposure for people or property. These areas are generally better suited to environmental, recreational and some agricultural uses.
Moderate	Less frequently affected by flooding or if more frequent, with shallow or slower moving floodwater. Conditions may pose an unacceptable risk to people or property if

Flood Study Data

The table(s) below display data from the flood studies applicable at the selected point.

Study: Quinzeh Creek Flood Study 2023

Likelihood (each year)	Hazard	Depth	Level	Velocity
20% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.5 metres per second
10% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.5 metres per second
5% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.5 metres per second
2% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.6 metres per second
1% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.6 metres per second
0.5% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.6 metres per second
0.2% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.5 metres per second
0.05% AEP	Hazard Category 1	0.0 metres	42.3 metres AHD	0.5 metres per second
PMF	Hazard Category 1	0.1 metres	42.4 metres AHD	0.7 metres per second

Term	Description
AEP	Annual Exceedance Probability, or the chance that a flood of that size or larger will occur in any given year. A low chance indicates a rare but larger flood.
Hazard	Level of danger, where 6 is highest, based on vulnerability curves considering depth and velocity presented in the Australian Institute for Disaster Resilience Handbook 7-3. • Hazard Category 1: Generally safe for vehicles, people and buildings. • Hazard Category 2: Unsafe for small vehicles. • Hazard Category 3: Unsafe for vehicles, children and the elderly. • Hazard Category 4: Unsafe for vehicles and people. • Hazard Category 5: Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure. • Hazard Category 6: Unsafe for vehicles and people. All building types considered vulnerable to failure.
	How deep the floodwater is projected to get (i.e. height of the water above the surface of the land) in a particular flood scenario, measured in metres. Flood depth is the

Data used is outdated and not best practice for flood modelling

- The flood studies were not prepared using a complete and fully current data set. Instead, key inputs such as stormwater infrastructure, culverts and drainage details were taken from older hydraulic models and earlier data sources, raising concerns about whether the modelling reflects the actual infrastructure and catchment conditions in place when the maps were adopted.

- Important infrastructure information was also missing or incomplete, including bridge, culvert, pipe dimension and invert level details. Where this information was unavailable or inconsistent, assumptions and model adjustments were used to fill the gaps, rather than a complete verified data set.

- The documents show that detailed field verification was limited, with broader in-person inspections not fully undertaken due to time and budget constraints. This is a significant limitation, because flood mapping depends heavily on accurate ground levels, drainage structures, bridge openings, culverts and local flow paths.

- Flood studies should not rely only on desktop modelling and officer assessment. Community and local councillor input is essential because residents have real lived experience of where floodwater actually goes, which roads are cut, which properties are affected and where modelled results do not match historical events.

- Moving flood study acceptance into an officer-led process reduces the opportunity for councillors to test the studies against local knowledge and community experience before the mapping is accepted and applied.

- This is particularly concerning given the scale of public objection, with Logan receiving the largest number of submissions in Council's history and Council acknowledging that many submissions raised concerns with the flood maps. That level of community concern should have triggered greater scrutiny, transparency and review, not a reduced role for councillors and the community.

modelled consistently between the 'Fast Model' and 'Detailed Model'. The following is of note with regards to the configuration of stormwater culverts:

- For most areas in the hydraulic model, details of stormwater culverts were obtained from the Engeny (2011) and WRM (2014) hydraulic models. Details of these culverts were confirmed using the Council's GIS database of hydraulic structures.
- For areas along the M1 Motorway (Pacific highway), details of stormwater culverts were obtained from the M1 Motorway hydraulic model WRM (2017).
- For areas within the Slacks and Scrubby creeks catchment, details of stormwater culverts were obtained from the Slacks and Scrubby Creeks hydraulic model (LCC, 2018). Note that the LCC (2018) hydraulic model contains a large number of trunk stormwater pipe networks. These trunk stormwater pipes were not included in the hydraulic model for the current study.

It is noted that the supplied stormwater network data does not provide a full and comprehensive data set with some missing information on the network including dimensions and elevations. Specifically, this includes:

- Several road culvert structures throughout the catchment were not included in the database (i.e. inspection of aerial imagery and LiDAR compared to provided data); and
- Invert level information included in the GIS data was incomplete and not available for some of cross drainage structures. Upon further review, the invert level information that was provided was not compatible with the topography in relatively new development areas.

As noted above, invert level information contained in the GIS data sets were incompatible with the model surface elevation. Considering the significant developments planned and undertaken in the Quinzeh Creek catchment since 2017, the model topography was locally altered to match pipe invert levels. This aspect is discussed separately in Section 2.8.

2.9 Data Summary

The data review completed by WT shows that there is an extensive amount of background information that is suitable and can be readily used to inform the current investigation. The key limitation in respect to the background data sets however relates to the information available on the model topography and the integration of the existing stormwater network data. As discussed previously, the existing stormwater network represented within the local catchment areas were found to be incompatible in respect to structure details, be that sizes or invert level information. Attempts have since been made by WT to better address the missing or erroneous information through:

- A series of site inspections undertaken across the catchment areas which has included physical site measurements and observations;
- Inspections of high definition aerial imagery as provided by Metromap for visible confirmation of select large structures; and
- Inclusion of as-constructed information as provided by Design Flow.

Despite the above, and in the absence of detailed survey, it has been necessary to adjust the model topography to match the council provided invert level information for a large number of structures. It is considered however that due to time availability, overall costs and discussions with Council, altering the topography, informed by the pipe invert, is considered reasonable and appropriate for the purposes of informing this study.

Yours sincerely,

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