

24 July 2025

Peter Morson
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Via email: peter@morsongroup.com.au

Dear Peter

Our ref: 24050074_L03V01_Flood_Compliance_Report

39-65 Old Castlereagh Rd – Flood Compliance Report

This letter is a flood compliance report for the proposed mixed-use tourism development at 39 – 65 Old Castlereagh Road, Castlereagh. It describes the nature of flooding on the site and the flood-related development controls that currently apply to the proposed development.

This flood assessment is based on the following documents:

- *Hawkesbury-Nepean River Flood Study* (NSW Reconstruction Authority, 2024)
- Site specific modelling of local flooding undertaken by Water Technology (2025) based on the Cranebrook Overland Flow Flood Study which was prepared for, and adopted by, Penrith City Council.
- Architectural plans – prepared by Morson Group (issued June 2025)
- State Environmental Planning Policy (Precincts – Western Parkland City) (SEPP) 2021
- Penrith Lakes Development Control Plan – Stage 1 (DCP) 2022.

1 THE PROPOSED DEVELOPMENT

Jacob 4765 Investments has submitted a concept development application for the construction of a mixed-use tourism development at 39 – 65 Old Castlereagh Road, Castlereagh. The proposed development is located within the Penrith Lakes Scheme and zoned for Tourism (Figure 1). It is therefore subject to the Penrith Lakes Development Control Plan – Stage 1 (DCP).

The site is comprised of three (3) lots, as shown in Figure 2 with a regional perspective provided in Figure 3:

- Lot 12/DP793163;
- Lot 14/DP793163; and
- Lot 16/DP793163.

The proposed development is intended to replace 2 existing houses and a number of sheds on the site with 3 multi-storey buildings for tourism purposes. The western building will be a club, the central building will be an indoor recreation centre and the eastern building a hotel with 147 hotel rooms. Floor plans and sections are shown in Figure 4 through to Figure 7.

An undercroft carpark would be located at ground level beneath all 3 buildings (Figure 4).

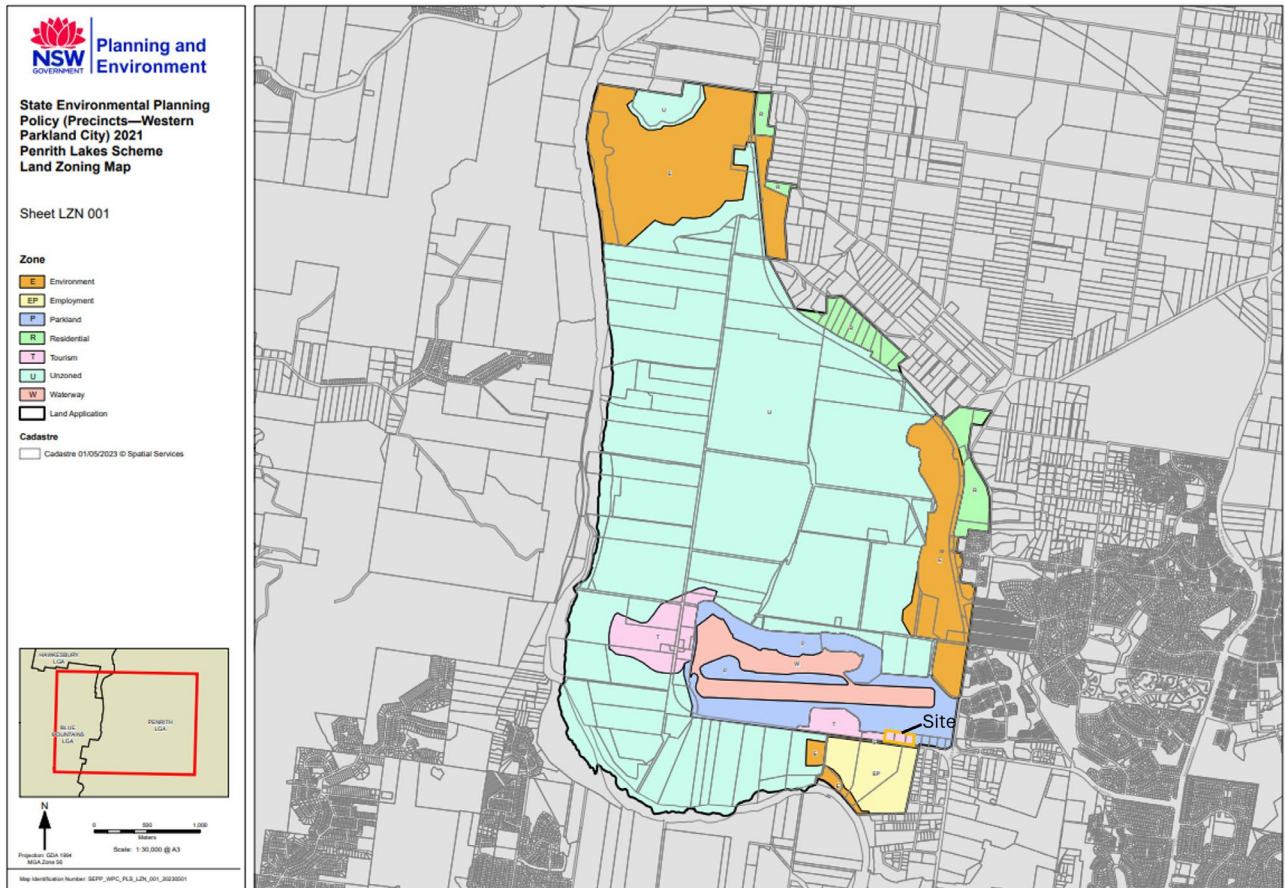


Figure 1 Penrith Lakes Scheme land zoning map



Figure 2 Lot Layout

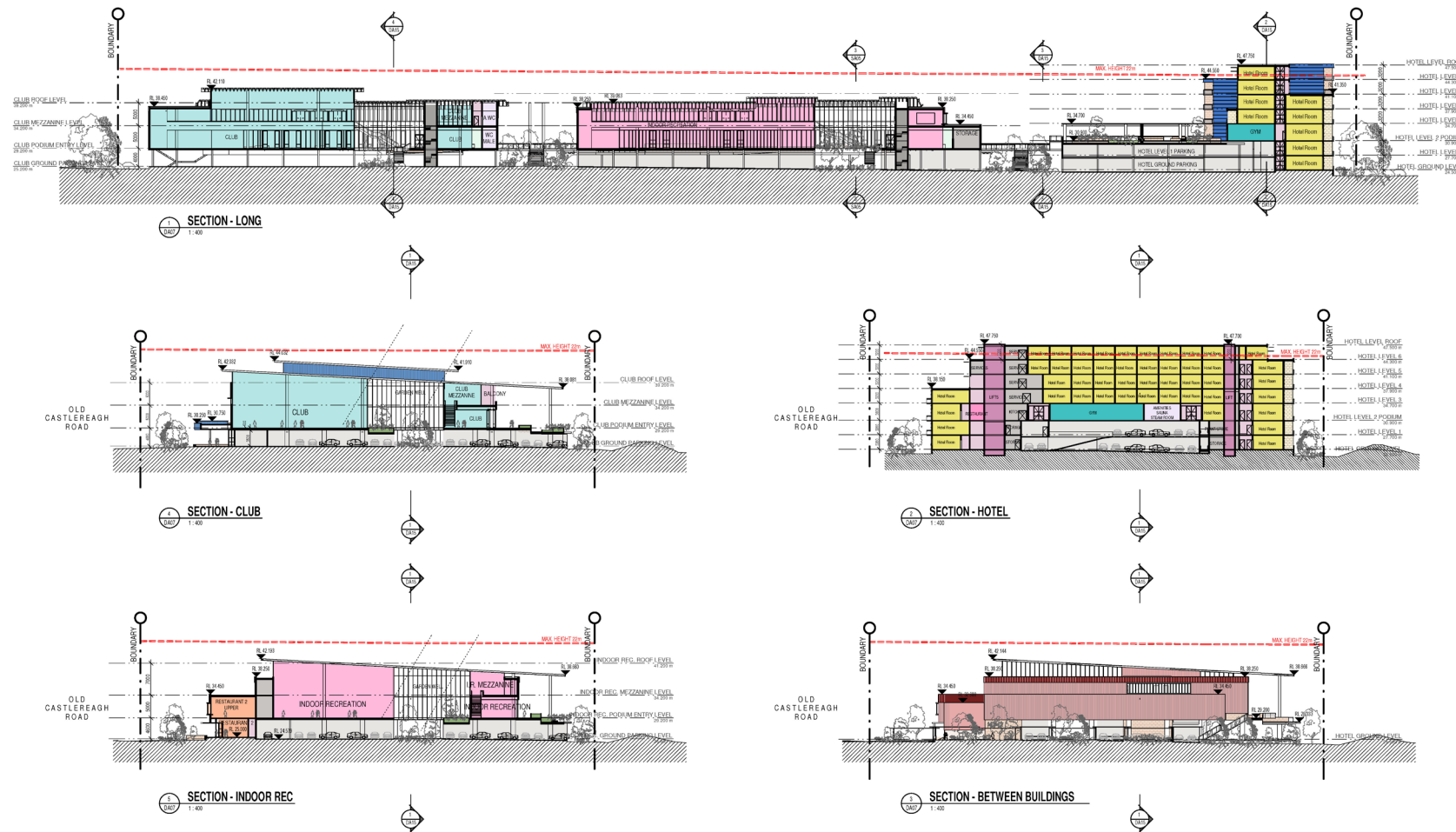


Figure 3 Site Location









REVISION	DATE	AMENDMENT	GENERAL LEGEND	PROJECT	PROJECT No.	MORSON GROUP	SHEET	SHEET NAME	DRAWING No.
RS	20-05-2025	PRELIMINARY	010 New Hydrant Storage	CASTLEREAGH TOURISM DEVELOPMENT	17011		SECTION A	SECTIONS	DA15
RS	21-05-2025	PRELIMINARY	020 General Notes	ADDRESS	CLIENT		SCALE	SCALE	ISSUE No.
PT	04-08-2025	PRELIMINARY	030 Existing Services	39-45 Old Castlereagh Rd, Castlereagh NSW 2143			1:400		A
A	09-08-2025	DA SUBMISSION	040 Top of Road						

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Figure 7 Sections



The proposed club building includes the following:

- Ground floor: Club entry, waste storage, undercroft parking (Figure 4)
- Level 1: Club, amenities and a waste room (Figure 6)
- Level 2: Mezzanine (Figure 7).

The indoor recreation facility includes:

- Ground floor: 2 restaurants and 2 kitchens, undercroft parking (Figure 4)
- Level 1: Indoor recreation area and amenities (Figure 6)
- Level 2: Mezzanine.

The proposed hotel includes:

- Ground floor: Hotel lobby, hotel offices, hotel rooms, waste storage, loading bay, undercroft parking (Figure 4)
- Level 1: Hotel rooms, parking, pool plant room (Figure 5)
- Level 2: Swimming pool, gym, restaurant, kitchen, hotel rooms, rain water tank (Figure 6)
- Levels 3 – 6: Hotel rooms (Figure 7).

2 FLOOD BEHAVIOUR

The site is subject to flooding from the Nepean River, which flows approximately 600 m to the south-west of the site, and also from overland flows which flow from south to north across Old Castlereagh Road, through the site and into the Regatta Lake.

2.1 Nepean River

Riverine flood behaviour is described based on modelling undertaken as part of the *Hawkesbury-Nepean River Flood Study* (NSW Reconstruction Authority, 2024).

Table 1 describes riverine flood behaviour at the site and along Andrews Road. Figure 8 through to Figure 12 show the flood extent and hydraulic hazard in the 5% Annual Exceedance Probability (AEP), 2% AEP, 1% AEP, 0.2% AEP and Probable Maximum Flood (PMF) riverine events in existing conditions.

The site would not be subject to riverine flooding in the 2% AEP event (Figure 9). However, in the 1% AEP flood the northern margin of the site would flood (Figure 10), with shallow (< 0.05 m) flooding in the northern portion of the undercroft carpark beneath the hotel building (Table 1). This flooding is caused by the Penrith Lakes filling from the river and, as the lake levels rise, water flowing through pipes in the embankment north of the site and into the lower parts of the site.

In the 0.2% AEP event (Figure 11) most of the undercroft carpark beneath the hotel and indoor recreational facility buildings would be inundated, while the ground floor hotel rooms, hotel lobby and hotel would flood to depths of 0.3 m.

The habitable area (i.e., kitchens and restaurants) on the ground floor of the indoor recreational facility would only flood to a depth of 0.2 m in the 0.1% AEP riverine flood (Table 1). On the other hand, during the 0.05% AEP event this area would flood to a depth of 1.9 m and the ground floor of the club would flood to a depth of 1.7 m.



Table 1 Riverine flood behaviour on site and on Andrews Road

Flood	Peak flood level at the site (m AHD)	Max. Hydraulic Hazard at the site	Max. Hydraulic Hazard on Andrews Rd	Site Affection	Site Isolation*
5% AEP	Not flooded	Not flooded	Not flooded	Not flooded	Not isolated
2% AEP	Not flooded	Not flooded	H2	Not flooded	Isolated by low hazard flooding
1% AEP	23.8	H3	H4	- Flood depths of up to 0.05 m in northern part of hotel undercroft carpark - Depths of up to 0.4 m in waste area at south-eastern corner of hotel - No above floor flooding of habitable areas	Isolated by medium hazard flooding
0.5% AEP	24.1	H4	H5	- Flood depths of up to 0.4 m in northern part of hotel undercroft carpark - Depths of up to 0.7 m in waste area at south-eastern corner of hotel - No above floor flooding of habitable areas	Isolated by high hazard flooding
0.2% AEP	24.8	H4	H5	- Above floor flooding of 0.3 m in the ground floor hotel rooms, hotel lobby and hotel offices - Flood depths of up to 1.2 m in the hotel undercroft carpark - Flood depths of up to 0.5 m across most of the indoor recreational facility undercroft carpark	Isolated by high hazard flooding
0.1% AEP	25.2	H5	H6	- Above floor flooding of 0.7 m in the ground floor hotel rooms, hotel lobby and hotel offices - Above floor flooding of 0.2 m in the ground floor kitchens and restaurants of the indoor recreational facility	Isolated by high hazard flooding



Flood	Peak flood level at the site (m AHD)	Max. Hydraulic Hazard at the site	Max. Hydraulic Hazard on Andrews Rd	Site Affection	Site Isolation*
				- Flood depths of up to 1.6 m in the hotel undercroft carpark - Flood depths of up to 0.9 m across most of the indoor recreational facility undercroft carpark - Flood depths of up to 0.3 m in the northern portion of the club undercroft carpark	
0.05% AEP	26.9	H6	H6	- Above floor flooding of 2.4 m in the ground floor hotel rooms, hotel lobby and hotel offices - Above floor flooding of 1.9 m in the ground floor kitchens and restaurants of the indoor recreational facility - Above floor flooding of 1.7 m in the ground floor of the club - Flooding of the undercroft carpark to depths of between 1.7 m and 3.3 m	Isolated by high hazard flooding
0.02% AEP	28.3	H6	H6	- Above floor flooding of 0.95 m in Level 1 hotel carpark - Above floor flooding of 0.6 m in Level 1 hotel rooms - Above floor flooding of 3.3 m in the ground floor kitchens and restaurants of the indoor recreational facility - Above floor flooding of 3.1 m in the ground floor of the club	Isolated by high hazard flooding
PMF	31.9	H6	H6	- Above floor flooding of 1.0 m in Level 2 of the hotel - Above floor flooding of 2.7 m in Level 1 of the indoor recreational facility and of the club - Level 2 of the club and the indoor recreational facility and Levels 3 – 6 of the hotel would be above the reach of flooding	Isolated by high hazard flooding

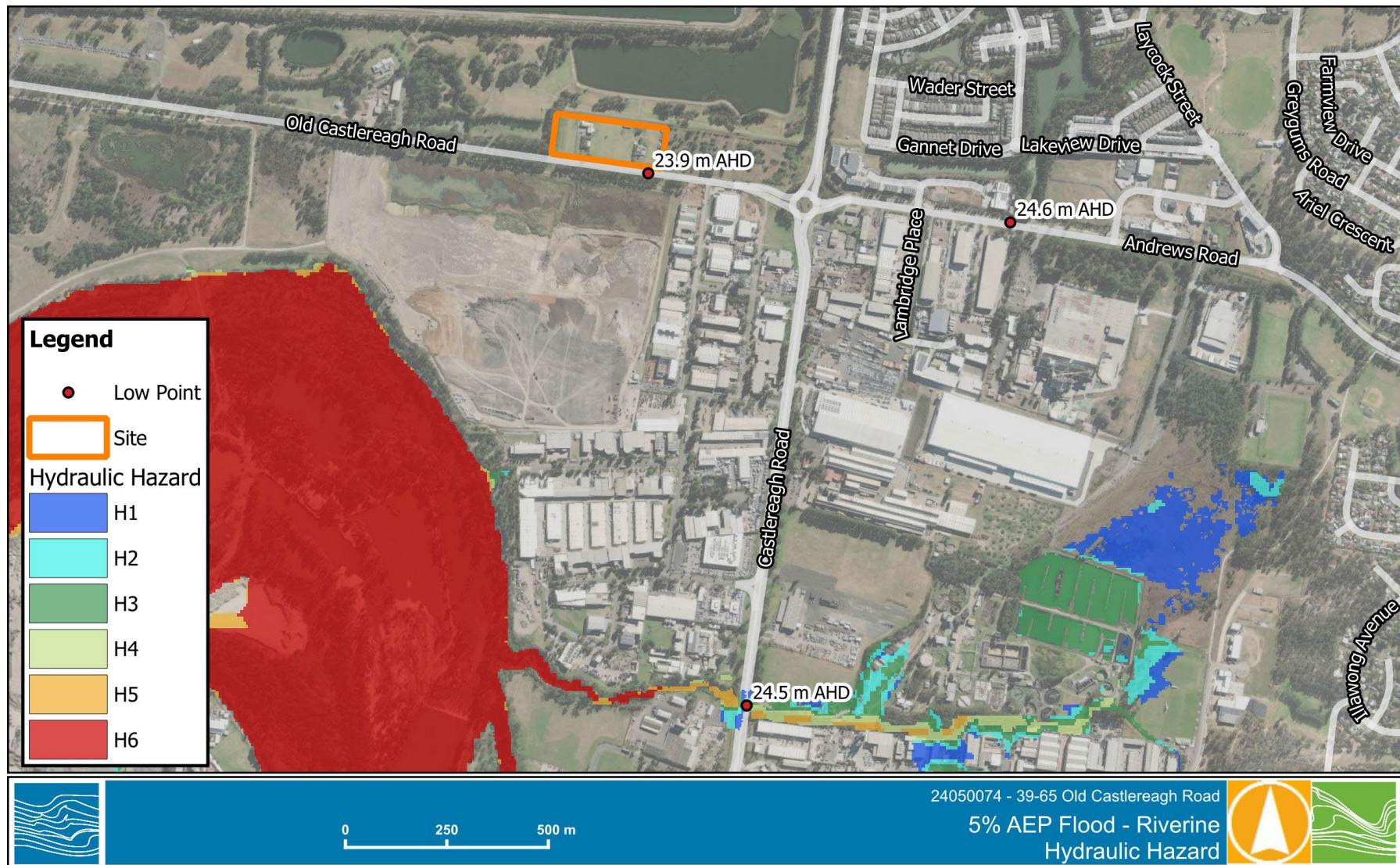


Figure 8 Hydraulic hazard in the 5% AEP riverine flood

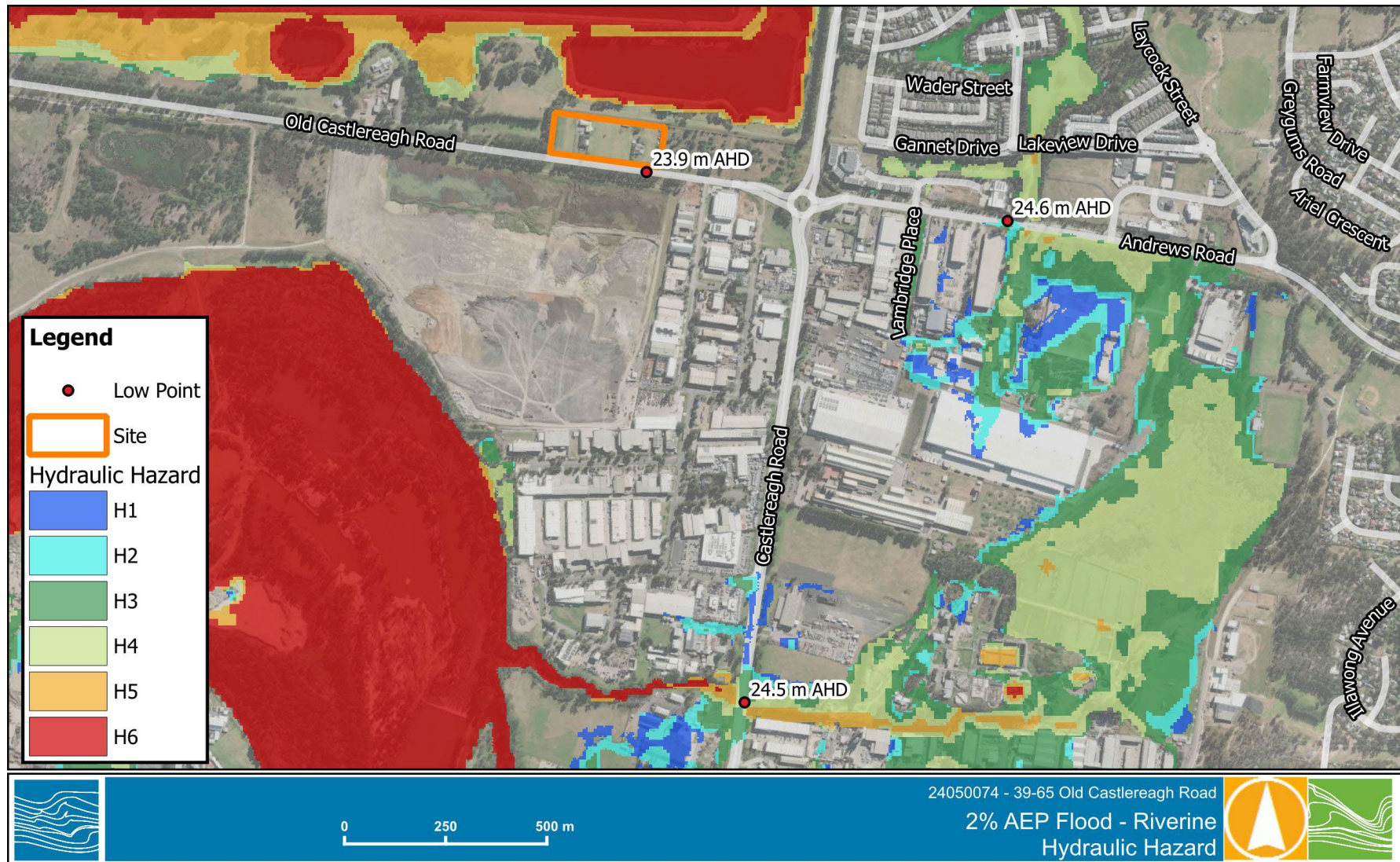


Figure 9 Hydraulic hazard in the 2% AEP riverine flood

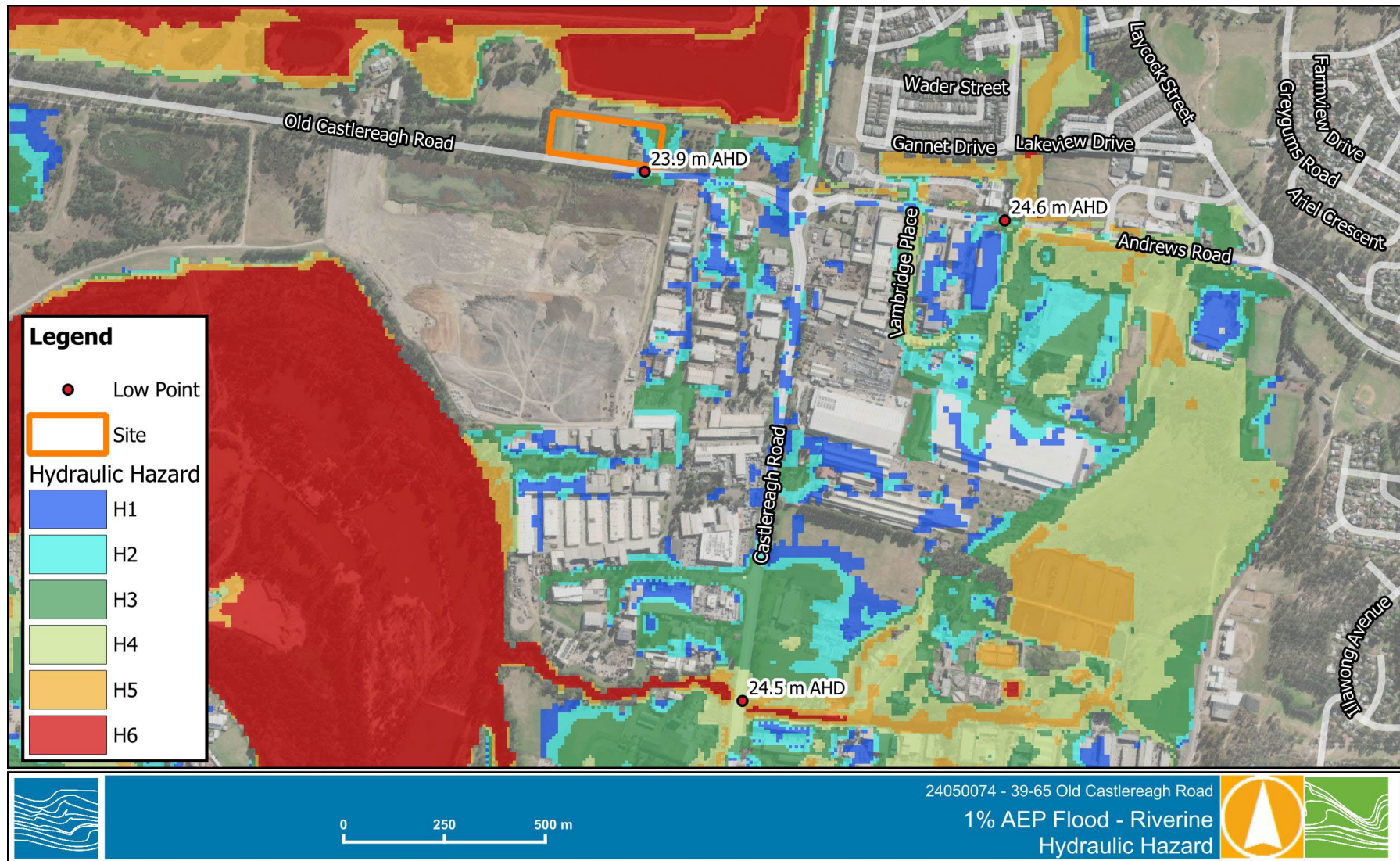


Figure 10 Hydraulic hazard in the 1% AEP riverine flood

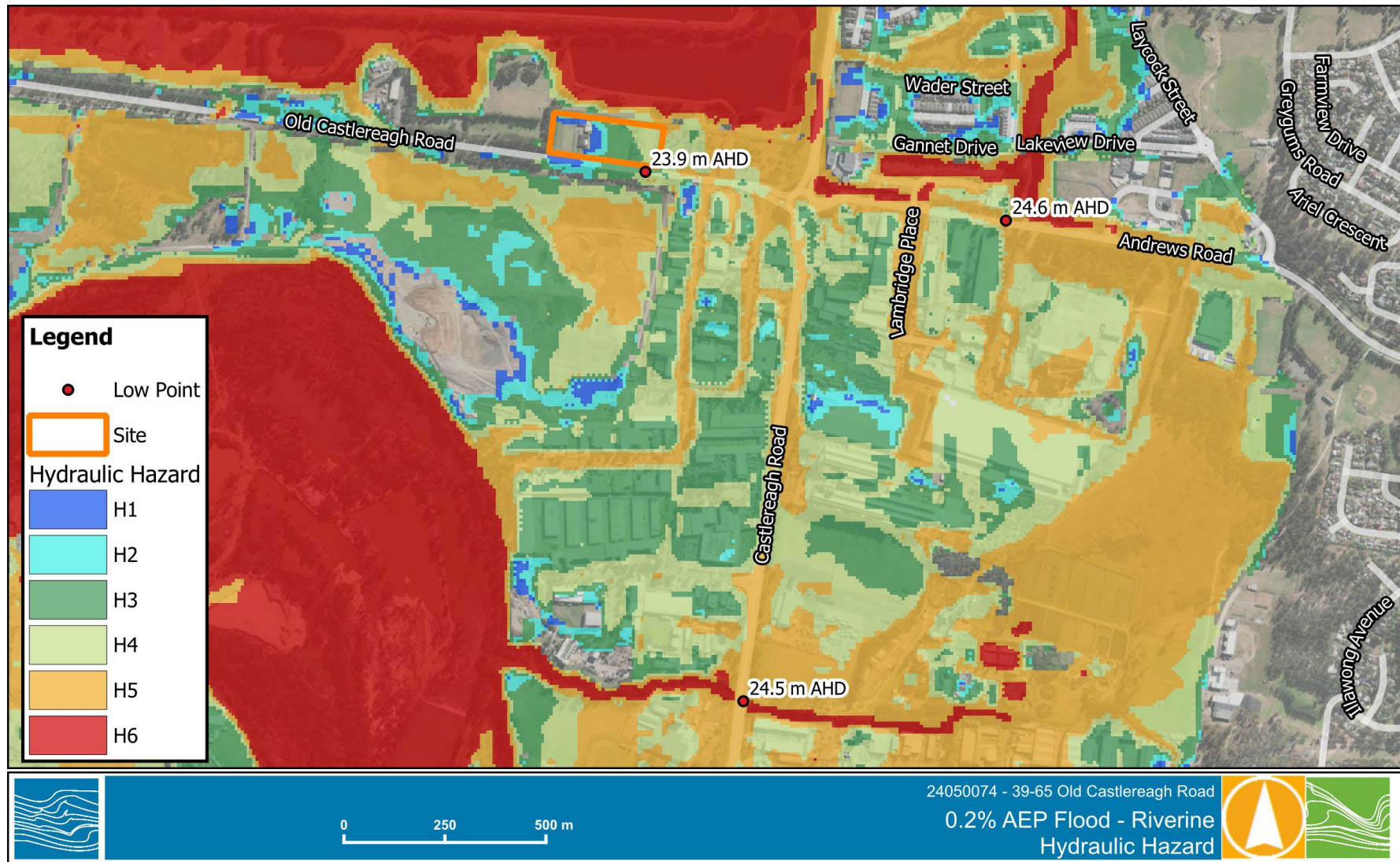


Figure 11 Hydraulic hazard in the 0.2% AEP riverine flood



Figure 12 Hydraulic hazard in the riverine PMF



In the 0.02% AEP flood Level 1 of the hotel would be inundated, with a depth of 0.95 m in the Level 1 carpark and of 0.6 m in the hotel rooms on this floor (Table 1).

The riverine PMF (Figure 12) would inundate Level 2 of the hotel to a depth of 1.0 m and would flood Level 1 of both the indoor recreational facility and the club building to a depth of 2.7 m. In this event all 3 buildings would be subject to H6 flooding. The threat to life or property posed by floodwaters can be measured with a parameter named hydraulic hazard, which is based on the combination of maximum flood depth and velocity at any given location. Figure 13 shows the national hydraulic hazard classification and the threat to life and property associated with each hazard class from H1 (minimum hazard) to H6 (maximum hazard). The H6 floodwaters that would surround the proposed buildings in the PMF would be unsafe for vehicles and people and buildings that have not been designed and constructed to withstand the forces associated with flooding would be vulnerable to failure.

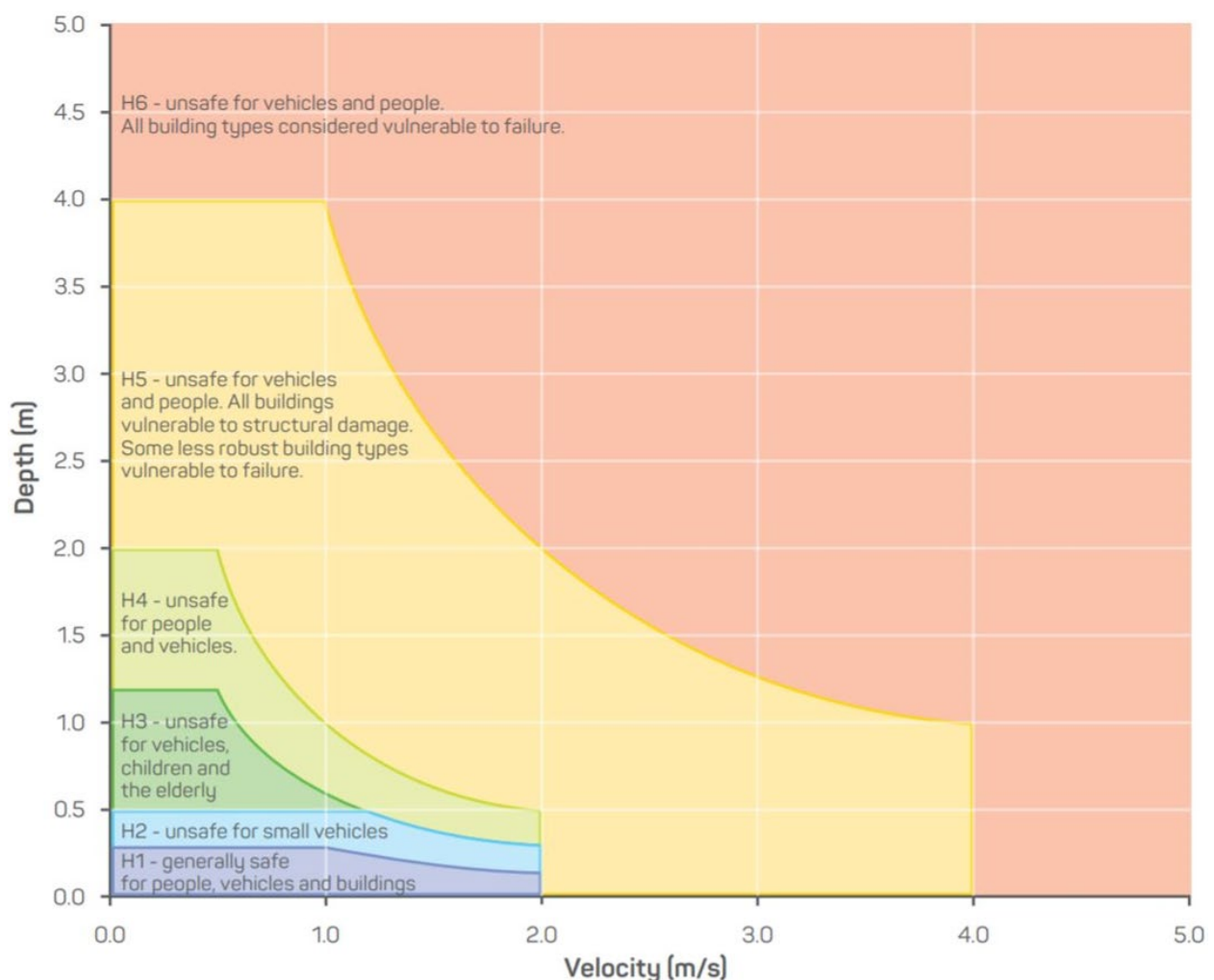


Figure 13 Flood hazard vulnerability curves (AIDR, 2017)

The following area would be above the reach of floodwaters in the PMF:

- Level 2 of the club building
- Level 2 of the indoor recreational facility
- Levels 3 – 6 of the hotel building.



2.2 Overland Flooding

The following analysis of overland flooding is based on site-specific modelling undertaken by Water Technology in 2025 for post-development conditions. The modelling shows that overland flooding flows northwards across Old Castlereagh Road at the south-eastern corner of the site before continuing to flow northwards along the site's eastern margin.

Table 2 describes riverine flood behaviour at the site and along Andrews Road. Figure 14 through to Figure 17 show the flood extent and hydraulic hazard in the 20% AEP, 1% AEP, 0.2% AEP and PMF riverine events in post-development conditions.

The site would be isolated by H1 floodwaters in overland floods at least as frequent as the 20% AEP event (Figure 14). H1 floodwaters generally do not cause stability issues for people or vehicles (Figure 13), although it is never advisable to drive or walk through floodwaters of any hydraulic hazard because conditions below the surface are unknown and the flood level could keep rising.

The site would also be isolated by H1 floodwaters in the 1% AEP overland flood (Figure 15). In this event the majority of the site would remain flood free, with the 1% AEP flood level around the margins of the site ranging from 23.44 m AHD in the north-east to 23.97 m AHD between the hotel building and Old Castlereagh Road and 24.55 m AHD in the north-western corner of the site.

It is only in events larger than the 0.2% AEP overland flood (Figure 16) that the site would become isolated by flooding with a hydraulic hazard greater than H1. In the overland PMF Old Castlereagh Road adjacent to the site would be subject to flooding with a maximum hydraulic hazard of H3, while Andrews Road would be subject to H5 flooding (Figure 17). In this event the ground floor hotel rooms, hotel lobby and hotel offices would be subject to above floor flooding with a maximum depth of 0.05 m. All other habitable areas in the proposed development would be above the overland PMF level.



Table 2 Overland flood behaviour on site and on Andrews Road

Flood	Max. Hydraulic Hazard on Old Castlereagh Rd	Max. Hydraulic Hazard on Andrews Rd	Site Affection	Site Isolation*
50% AEP	Not flooded	H1	H1 flooding along the northern, eastern and western margins of the hotel building	Isolated by low hazard flooding
20% AEP	Not flooded	H1	H1 flooding along the northern, eastern and western margins of the hotel building	Isolated by low hazard flooding
10% AEP	Not flooded	H1	H1 flooding along the northern, eastern and western margins of the hotel building	Isolated by low hazard flooding
5% AEP	Not flooded	H1	- H1 flooding along the northern, eastern and western margins of the hotel building - H2 flooding at north-eastern corner of hotel	Isolated by low hazard flooding
2% AEP	Not flooded	H1	- H1 flooding along the northern, eastern and western margins of the hotel building - H2 flooding at north-eastern corner of hotel	Isolated by low hazard flooding
1% AEP	H1	H1	- H1 flooding along the northern, eastern and western margins of the hotel building - H2 flooding at north-eastern corner of hotel	Isolated by low hazard flooding
0.5% AEP	H1	H1	- H1 to H3 flooding along the northern, eastern and western margins of the hotel building - H1 flooding in the northern portion of the hotel undercroft carpark - H1 flooding along the northern margins of the indoor recreational facility and club buildings	Isolated by low hazard flooding



Flood	Max. Hydraulic Hazard on Old Castlereagh Rd	Max. Hydraulic Hazard on Andrews Rd	Site Affection	Site Isolation*
0.2% AEP	H1	H1	■ H1 to H3 flooding along the northern, eastern and western margins of the hotel building ■ H1 flooding in the northern portion of the hotel undercroft carpark ■ H1 flooding along the margins of the indoor recreational facility and club buildings	Isolated by low hazard flooding
PMF	H3	H5	■ Up to H3 flooding in hotel undercroft carpark ■ H1 flooding in eastern portion of undercroft carpark below indoor recreational facility ■ H1 and H2 flooding along the margins of the indoor recreational facility and club buildings ■ Above floor flooding to a depth < 0.05 m in ground floor hotel rooms, hotel lobby and hotel offices	Isolated by high hazard flooding

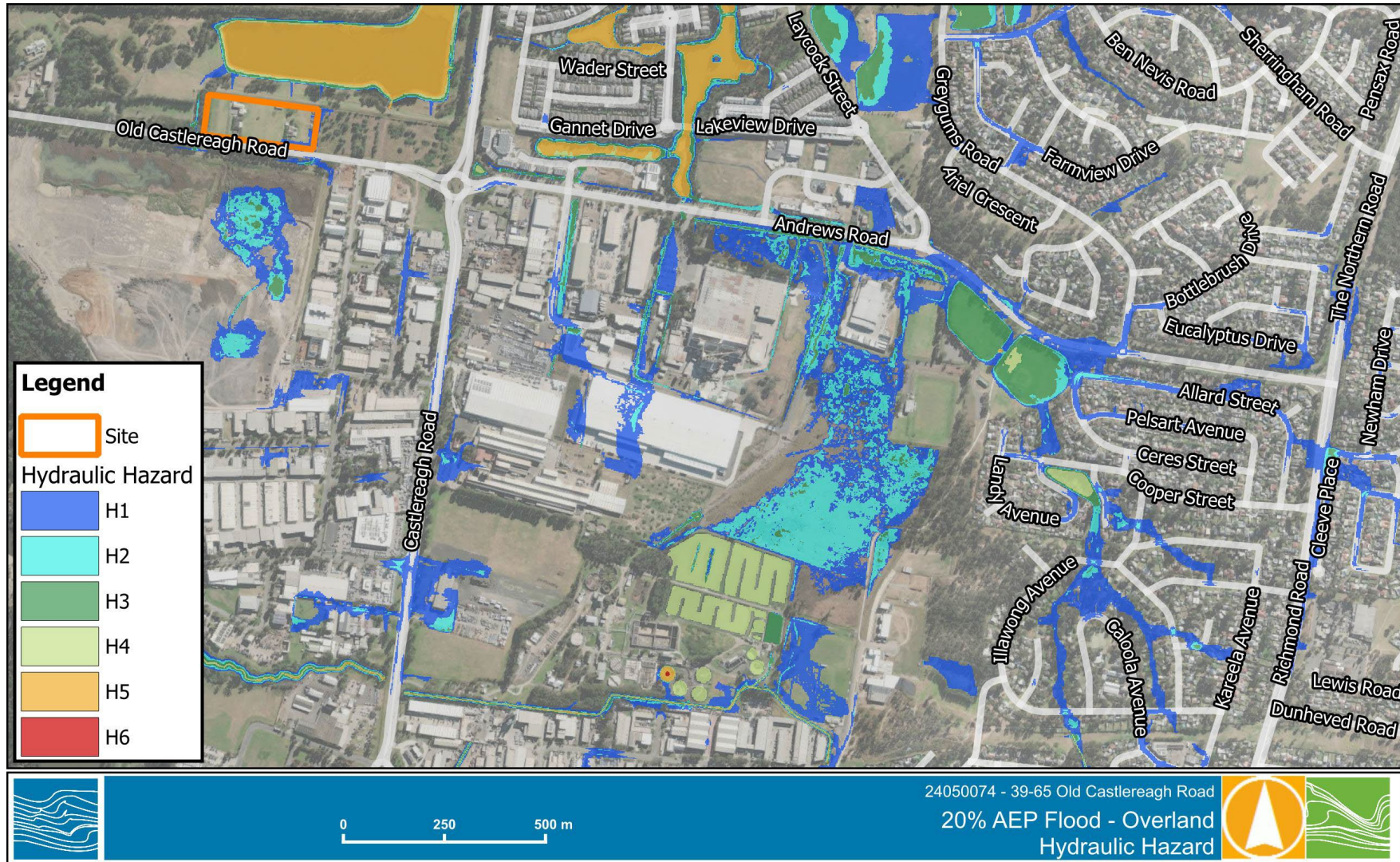


Figure 14 Hydraulic hazard in the 20% AEP overland flood in post-development conditions

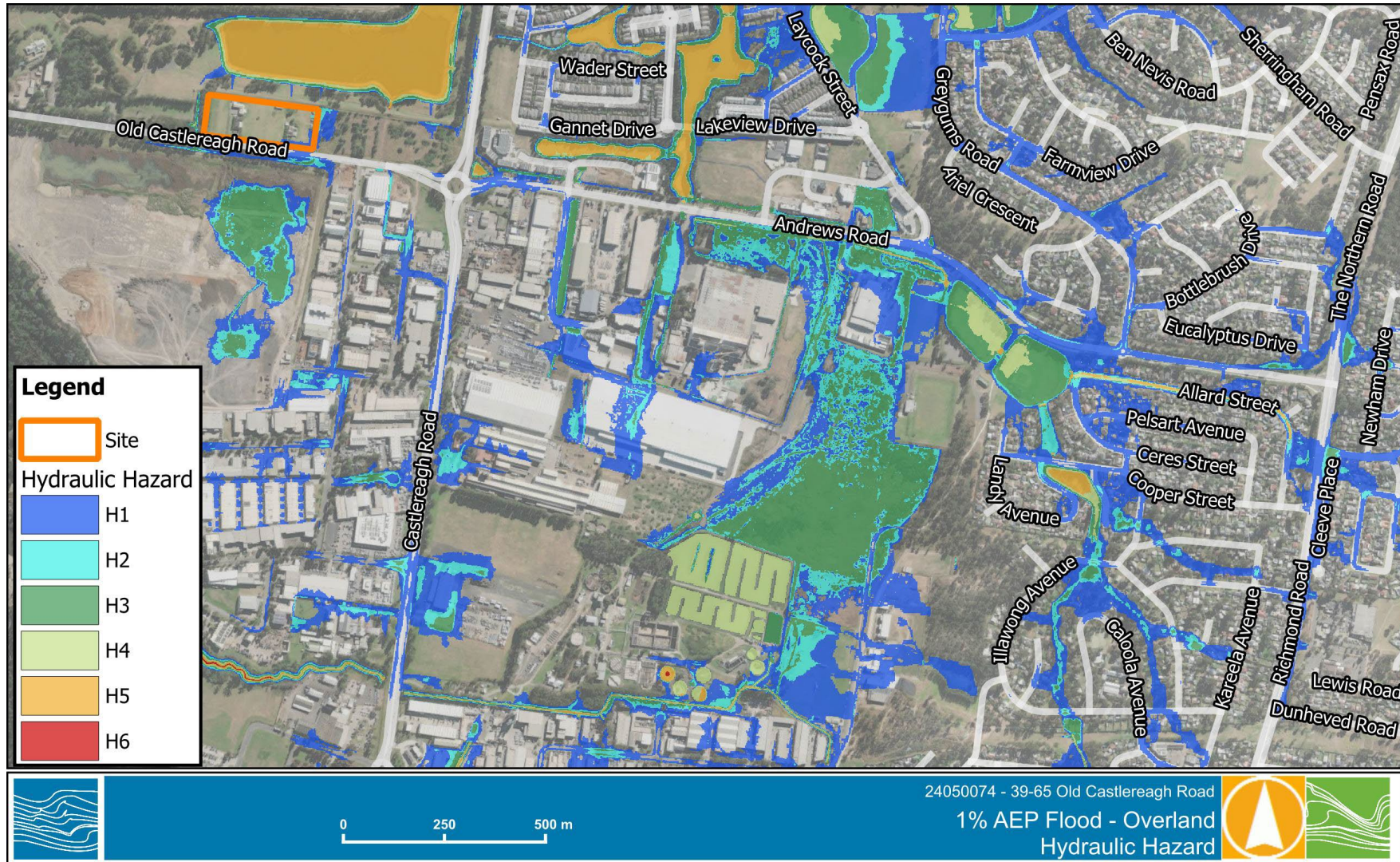


Figure 15 Hydraulic hazard in the 1% AEP overland flood in post-development conditions

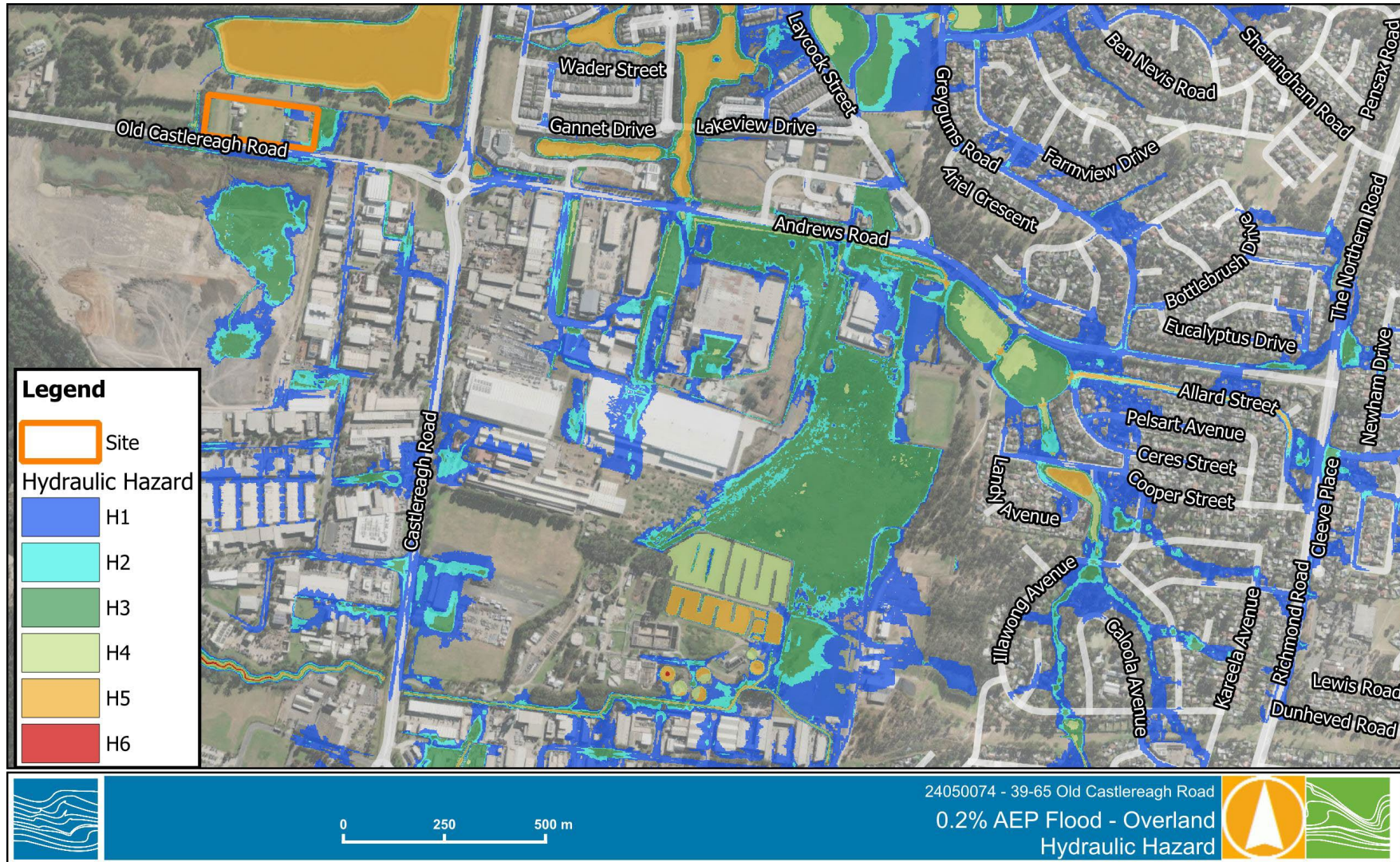


Figure 16 Hydraulic hazard in the 0.2% AEP overland flood in post-development conditions

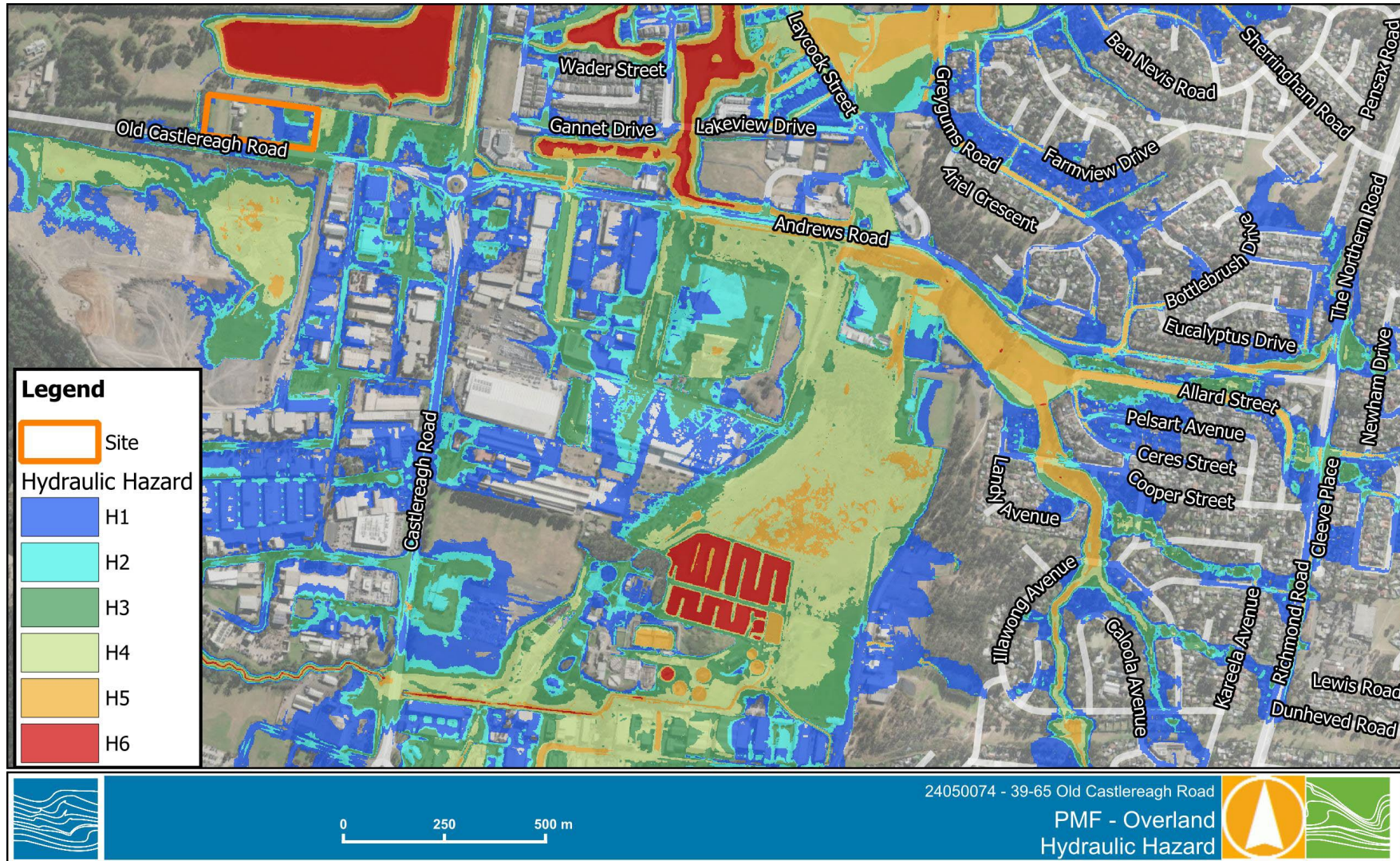


Figure 17 Hydraulic hazard in the overland PMF in post-development condition



3 PENRITH LAKES DEVELOPMENT CONTROL PLAN (DCP) 2022

The subject site is zoned for Tourism (Figure 1) under Chapter 5 – Penrith Lakes Scheme of the SEPP 2021. Therefore, the land is subject to the flood-related development controls set out Section 3.1 of the Penrith Lakes DCP 2022. These development controls are identified and discussed in Table 3 and Table 4.

Controls 1 – 2 of Section 3.1 of the DCP apply to all proposed development, whereas controls 3 – 15 apply to land below the flood planning level (FPL). The FPL is defined in the DCP as the 1% AEP flood level plus 1.0 m freeboard. The riverine 1% AEP flood level applicable to the whole site is 23.8 m AHD, while the overland flood level ranges from 23.44 m AHD to 24.55 m AHD. The FPL is based on the higher of the riverine and the overland 1% AEP flood levels. Therefore, once the 1.0 m freeboard is applied the FPL for the site ranges from 24.8 m AHD to 25.55 m AHD. The majority of the site is below these levels. Therefore, most of the site is below the FPL and controls 3 – 15 apply to the proposed development.

Table 3 Flood-related development controls in Section 3.1 of the DCP 2022

Control	Comments Pertaining to the Proposed Development
3.1 (1) Development on land below the level of the PMF that will increase the number of people on the land must be consistent with the flood evacuation requirements outlined in Section 3.1.1 of the DCP.	The proposed development will increase the number of people on land below the riverine PMF level. Therefore, control 3.1 (1) applies. The consistency of the proposed development with the flood evacuation requirements set out in Section 3.1.1 of the DCP is outlined in Table 4. Complies.
3.1 (2) All development that will increase the number of people on the land must submit a flood emergency management plan prepared in accordance with and to demonstrate compliance with flood evacuation requirements in Section 3.1.1 of the DCP.	The proposed development will increase the number of people that could be on the land. Therefore, a flood emergency response plan (FERP) has been prepared for the proposed development. Compliance of the proposed development with the flood evacuation requirements set out in Section 3.1.1 of the DCP is outlined in Table 4. Complies.
3.1 (3) A flood and drainage investigation that overlays the 20%, 5%, 1%, 0.2% AEP and PMF level and any overland flows must be submitted with a development application. The levels on the survey are required to be verified during construction by a survey certificate.	Overlays of the 20% AEP, 5% AEP, 1% AEP, 0.2% AEP and PMF overland flood depths are provided in the Flood Assessment and overlays of the hydraulic hazard in the 5% AEP, 1% AEP, 0.2% AEP and PMF riverine events are provided in the Flood Emergency Response Plan. Flood levels in the 20% AEP, 5% AEP, 1% AEP, 0.2% AEP and PMF riverine and overland events are provided in Attachment 1 and Attachment 2, respectively, of this letter. The levels on the survey will be verified during the construction stage. Complies.
3.1 (4) The drainage investigation must acknowledge and mitigate the effects of flood on proposed infrastructure.	The Flood Assessment report outlines the effects of the proposed development on flooding and demonstrates that adding a second pipe at the northern end of the overland flow path results in a lowering of peak water levels upstream of the embankment on the site with minimal changes to flooding behaviour occurring downstream. Complies.
3.1 (5) Development must not adversely impact flood behaviour for the full range of	The Flood Assessment demonstrates that the proposed development will not increase flood levels on upstream



Control	Comments Pertaining to the Proposed Development
floods (up to and including the PMF) and is to consider cumulative impacts of development on surrounding land, including: a) loss of flood storage; b) loss of or changes to flood flow paths; c) acceleration or obstruction of flood flows; d) increase in the depth, duration or velocity of floodwaters; and e) any reduction in flood warning times elsewhere on the floodplain.	properties or on the property directly to the east of the site in the 1% AEP overland flood. The 1% AEP critical duration within the site would reduce from 6 hours to 1 hr which indicates that the proposed development would allow water to discharge more freely from the site, but there would be no fundamental changes in flooding behaviour in the downstream lake system. Therefore, in the 1% AEP overland flood there would be no loss of flood storage, no substantial changes to overland flow paths, no significant obstruction of flows and no increase in flood depth on upstream properties. The proposed additional pipe through the embankment at the northern end of the flow path would allow pooling floodwaters to more freely discharge into the lake. The impacts of the proposed development on overland and riverine flooding would not impact flood levels, particularly not along regional evacuation routes, and therefore would not result in reduced warning times elsewhere. In the 1% AEP riverine flood and all riverine events up to and including the 0.2% AEP flood the north-eastern corner of the site is classified as flood fringe (Attachment 3). The <i>Flood Risk Management Guideline FB02: Flood Function</i> (DPE, 2023) specifies that flood fringe areas are not sensitive to adjustments in storage or flow conveyance. Therefore, the proposed development would not adversely impact flood behaviour on surrounding land in riverine floods up to and including the 0.2% AEP flood. In the 0.05% AEP riverine flood (and therefore also the PMF) the site would be classified as floodway. Therefore, it is possible for the proposed development to impact riverine flood behaviour. However, most of the ground floor of the development is undercroft parking which would not take up any flood storage and floodwaters would flow through this area without any real change in flow paths. The ground level walls of the three buildings would have a total length of approximately 250 m. This compares to the 5,200 m floodplain width in the PMF. Furthermore, as shown by the 0.2% AEP flood function mapping, there are flow channels to the east and west of the site which would convey more of the flow in a PMF than would be flowing through the site. Therefore, the proposed development would only have a minor impact on flood levels in an event of this magnitude. In the case of overland flooding, significant flood depths occur where water ponds behind the existing embankment. It is proposed to install a second pipe through that embankment to relieve some of the overland flooding. Furthermore, the provision of undercroft parking means that water will still be able to pond to a similar extent after the development is completed so it will have little impact on overland flood storage or levels up to the PMF. Complies.



Control	Comments Pertaining to the Proposed Development
3.1 (6) The applicant must demonstrate that:	
a) the development will not increase the flood hazard or risk to other properties;	See discussion of control 3.1 (5) for discussion of the impact of the proposed development on flood hazard and flood risk. Complies.
b) all structures are designed and constructed to ensure structural integrity up to the 0.2% AEP, taking into account the forces of ccc. Structural certification must be provided confirming the above;	The buildings will be designed and constructed to ensure structural stability when subjected to the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion in events up to and including the PMF. The current development application is only a concept development application and therefore structural certification can be provided at a subsequent application stage. Complies.
c) the proposed building materials are flood-compatible;	The building will be composed of flood compatible materials below the PMF level. The current development application is only a concept development application and therefore details regarding building materials can be provided at a subsequent application stage. Complies.
d) the buildings are sited in the optimum position to avoid floodwaters and allow safe flood evacuation; and	The buildings are sited on land that is flood free in events up to and including the 2% AEP flood, while only the north-eastern corner of the site would be impacted in the riverine 1% AEP flood. Several driveways from the site to Old Castlereagh Road are provided to allow access to the evacuation route. The flood emergency response strategy for the development is to evacuate early, fully evacuating before riverine floodwaters reach the site or cut the regional evacuation route. Therefore, the proposed configuration of buildings is sufficient for allowing evacuation ahead of riverine flooding. There is potential for overland flooding to inundate the evacuation route at the south-eastern corner of the site while evacuation of the site is occurring. However, these flows are unlikely to be hazardous. The evacuation route along Old Castlereagh Road and Andrews Road would only be subject to H1 flooding from overland flows in events up to and including the 0.2% AEP flood. The NSW SES prefers regional evacuation routes be flood free in the 0.2% AEP event. However, the existing regional evacuation route nominated by the NSW SES for the Penrith Lakes sector (i.e., The Northern Road) would be subject to H1 floodwaters in the 0.2% AEP overland event, which do not generally cause stability issues for vehicles. Therefore, the evacuation route would be trafficable in overland events up to and including the 0.2% AEP flood. While it is generally advisable not to drive through floodwaters, in this case it is preferable for site occupants to do so to ensure timely evacuation completion. No alternative siting of the buildings



Control	Comments Pertaining to the Proposed Development
	would avoid the need to drive through the low points on the regional evacuation route. Complies.
e) the development will not expose any occupants of the land to unacceptable levels of risk.	The flood emergency response strategy for the development is to evacuate early, fully evacuating before riverine floodwaters reach the site or cut the regional evacuation route. Therefore, in most cases early evacuation will prevent site occupants from coming into contact with hazardous floodwaters. There is potential for overland flooding to inundate the evacuation route while evacuation of the site is occurring. However, these flows are unlikely to be hazardous. The evacuation route along Old Castlereagh Road and Andrews Road would only be subject to H1 flooding from overland flows in events up to and including the 0.2% AEP flood. The NSW SES prefers regional evacuation routes be flood free in the 0.2% AEP event. However, the existing regional evacuation route nominated by the NSW SES for the Penrith Lakes sector (i.e., The Northern Road) would be subject to H1 floodwaters in the 0.2% AEP overland event, which do not generally cause stability issues for vehicles. Therefore, the evacuation route would be trafficable in overland events up to and including the 0.2% AEP flood. While it is generally advisable not to drive through floodwaters, in this case it is preferable for site occupants to do so to ensure timely evacuation completion. It would only be in overland events larger than the 0.2% AEP flood, with probabilities approaching that of the PMF (which has a probability of approximately 1 in 10,000,000 in any given year, see Section 2.3.2.1 of the FERP for discussion) that the evacuation route would be cut by H2 or greater floodwaters. However, it should be noted that Level 2 of the club building, Level 2 of the indoor recreational facility and Levels 3 – 6 of the hotel building would be above the riverine PMF level. Therefore, should occupants of the proposed development fail to evacuate prior to the evacuation route becoming cut by floodwaters they could shelter above the floodwaters in these areas, informing the NSW SES of their situation. The consequences of failed evacuation for the site occupants thus would not be drowning, but isolation potentially for a number of days. Sheltering on site should only be a last resort if evacuation has failed. Therefore, the flood risk to site occupants can be appropriately managed. Complies.
3.1 (7) Development, excluding temporary structures, in high flood hazard areas, floodways' and land below the 1% AEP should be avoided.	In the 1% AEP riverine flood most of the site would be flood free while the north-eastern corner of the site would have a maximum hydraulic hazard of H3 and the northern part of the hotel undercroft carpark would flood to a maximum depth of 0.05 m. This flooding is caused by the Penrith



Control	Comments Pertaining to the Proposed Development
	Lakes filling from the river and, as the lake levels rise, water flowing through pipes in the embankment north of the site and into the lower parts of the site. In the 1% AEP overland flood most of the site would also be flood free with a maximum hydraulic hazard of H2 in the north-eastern corner of the site. Therefore, the development is not located in a high flood hazard area or a floodway in the 1% AEP event. While the north-eastern corner of the hotel undercroft carpark would flood to a maximum depth of 0.05 m, this is not a habitable use. Complies.
3.1 (8) Development must demonstrate that any overland flow is maintained for the 1% AEP overland flow.	Section 2.4 of the Flood Assessment demonstrates that the proposed development and the inclusion of an additional pipe outlet at the northern end of the overland flow path will maintain overland flow in the 1% AEP event relative to existing conditions. Complies.
3.1 (9) Consent will not be granted to filling of floodways or high flood hazard areas.	Some minor fill is proposed to achieve floor levels in the undercroft car park. In the 1% AEP riverine flood most of the site would be flood free while the north-eastern corner of the site would have a maximum hydraulic hazard of H3 and the northern part of the hotel undercroft carpark would flood to a maximum depth of 0.05 m. This flooding is caused by the Penrith Lakes filling from the river and, as the lake levels rise, water flowing through pipes in the embankment north of the site and into the lower parts of the site. In the 1% AEP overland flood most of the site would also be flood free with a maximum hydraulic hazard of H2 in the north-eastern corner of the site. Therefore, the development is not located in a high flood hazard area or a floodway in the 1% AEP event and fill is not proposed in a floodway or high flood hazard area. Complies.
3.1 (10) Development shall be consistent with the following guidelines: a) <i>Managing Flood Risk Through Planning Opportunities—Guidance On Land Use Planning In Flood Prone Areas</i> (Hawkesbury–Nepean Floodplain Management Steering Committee); b) <i>Reducing Vulnerability of Buildings to Flood Damage—Guidance On Building In Flood Prone Areas</i> (Hawkesbury–Nepean Floodplain Management Steering Committee); and c) <i>Designing Safer Subdivisions—Guidance On Subdivision Design In Flood Prone Areas</i> (Hawkesbury–	The proposed development has been prepared to be consistent with <i>Managing Flood Risk Through Planning Opportunities—Guidance On Land Use Planning In Flood Prone Areas</i>. The flood hazard and risk are set out in Chapter 2 of the Flood Emergency Response Plan (FERP), measures for reducing the flood risk to people are set out in the FERP and measures for reducing the flood risk to buildings and property are discussed in both the Flood Assessment and the FERP. The guideline <i>Reducing Vulnerability of Buildings to Flood Damage—Guidance On Building In Flood Prone Areas</i> focuses on reducing the vulnerability of dwellings/houses to flooding. As no dwellings are proposed this guideline is not directly applicable to the site. However, the proposed development will be constructed to be consistent with <i>Reducing Vulnerability of Buildings to Flood Damage—Guidance On Building In Flood Prone Areas</i> as far as practicable, including the requirement set out in Chapter 4.5



Control	Comments Pertaining to the Proposed Development
Nepean Floodplain Management Steering Committee).	of the FERP that the buildings must be designed and constructed to remain structurally stable in the PMF. No subdivision of the land is proposed therefore the proposed development the Designing Safer Subdivision guideline is not applicable to the site. Complies.
3.1 (11) Development must avoid significant adverse effects on the floodplain environment that would cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of the riverbank or watercourse.	The proposed development is not located on or adjacent to the riverbank of the Nepean River and therefore will not impact erosion, siltation, destruction of riparian vegetation or a reduction in the stability of the riverbank. The proposed development is located directly to the south of a lake. Overland flooding flows northwards through the site, through pipes in an embankment and into the lake to the north. Therefore, the Flood Assessment recommends works downstream of the embankment, such as scour protection or the formalisation of a headwall structure, to ensure that the proposed development does not result in concurrent adverse impacts such as an increase in erosion potential. The current development application is only a concept development application and therefore further details can be provided at a subsequent application stage. Complies.
3.1 (12) All electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed, located above the flood planning level, or both.	Where practicable electrical equipment, power points, wiring, fuel lines, sewerage systems and other pipes and connections will be located above the FPL. Where this is not practicable these assets will be waterproofed up to the FPL. The current development application is only a concept development application and therefore further details can be provided at a subsequent application stage. Complies.
3.1 (13) Hazardous or potentially polluting materials must not be stored below the 0.2% AEP level unless adequately protected from floodwaters in accordance with industry standards.	The only storage area below the 0.2% AEP flood level (24.8 m AHD) is the waste area at the south-eastern corner of the ground floor of the hotel. Details regarding the type of waste to be stored here will be provided at a subsequent application stage. Should hazardous or potentially polluting materials be stored here, the entry to the waste room will be protected by a flood barrier up to the 0.2% AEP flood level. Complies.
3.1 (14) Adequate flood signage and exits must be installed to facilitate safe and orderly evacuation from flooding without reliance upon the State Emergency Service or other authorised emergency services personnel.	Details regarding flood signage are set out in Chapter 4.5 of the FERP. Flood signage will be installed around the site detailing that the site is subject to flooding and that site occupants must evacuate immediately if instructed to do so by a staff member. The evacuation route is also to be provided on the signage. The flood emergency response strategy is for early self-evacuation of the site occupants without reliance on the NSW SES. Actions, roles and responsibilities for implementing early evacuation are set out in Chapter 5 of the FERP. Complies.



Control	Comments Pertaining to the Proposed Development
3.1 (15) Fencing must not impede the flow of floodwaters or increase flood affectation on surrounding land.	The current development application is only a concept development application and therefore further details regarding fencing can be provided at a subsequent application stage. Any fencing in an area impacted by floodwaters will be permeable and allow floodwaters to flow through the fence so as not to adversely impact on flood behaviour. Complies.

Table 4 Flood evacuation-related development controls in Section 3.1.1 of the DCP 2022

Control	Comments Pertaining to the Proposed Development
3.1.1 (1) Development that will increase the number of people on the land below the probable maximum flood (PMF) level at Penrith Lakes covered by this DCP must be consistent with the Early Flood Evacuation Guideline (if available), or the objective to achieve early site evacuation and/or non-attendance in the event of a flood or probable flood.	The proposed development will increase the number of people on land below the riverine PMF level. Therefore, control 3.1.1(1) applies. There is currently no Early Flood Evacuation Guideline that has been endorsed by the NSW SES. Therefore, the proposed development has been prepared to be consistent with the objective of achieving early site evacuation and non-attendance in the event of a flood or probable flood. Sections 4.4 and 5.3.2 of the Flood Emergency Response Plan (FERP) set out the actions for closure of certain facilities, appointments and deliveries when a Moderate flood warning is issued and for early evacuation of the site prior to the NSW SES ordering evacuation of surrounding evacuation subsectors. Sections 3 and 4 of the Flood Evacuation Modelling Assessment (FEMA) and Section 4.2 discuss how early evacuation of the site can be achieved. Complies.
3.1.1 (2) Development consent must not be granted to development on land below the PMF level that will increase the number of people on the land, unless the consent authority is satisfied that:	The proposed development will increase the number of people on land below the riverine PMF level. Therefore, control 3.1.1(2) applies.
a) appropriate systems and processes will be in place to ensure the efficient evacuation of the site and surrounding area and will not adversely impact on the evacuation routes in the Hawkesbury-Nepean Valley floodplain in the event of a flood; and	The FERP and the FEMA include appropriate systems and processes to ensure efficient evacuation. Sections 3 and 4 of the FEMA discuss the triggers for evacuation that will allow the proposed development to achieve early evacuation without adversely impacting the evacuation routes in the Hawkesbury-Nepean floodplain. The FEMA demonstrates that a flood warning for a flood level of 24.35 m AHD or greater at the Penrith (Victoria Bridge) gauge would provide sufficient time for evacuation of the proposed development and existing developments in the Penrith Lakes sector in the 0.02% AEP event before evacuating vehicles from the Penrith North sector would start using the road network. Section 4.5 of the FERP sets out the Flood Risk Management Features to be integrated into the design, construction and operation of the proposed development to



Control	Comments Pertaining to the Proposed Development
	ensure that efficient evacuation can occur. This includes nominating staff as Flood Wardens, resourcing and training the Flood Wardens and subscribing them to appropriate apps for monitoring evacuation triggers. In addition, a Public Address system and flood signage will be installed to ensure evacuation instructions can be communicated efficiently. The actions for implementing evacuation and flood emergency response are set out in Section 5.3 of the FERP. Complies.
b) a flood emergency management plan has been prepared.	A Flood Emergency Response Plan (FERP) has been prepared for the proposed development. Complies.
3.1.1 (3) The flood emergency management plan must address the following matters:	
a) an overview of the flood risk and resilience of the site and the surrounding area;	An overview of the flood risk and resilience of the site and the surrounding area is set out in Section 2 of the FERP. Complies.
b) details the requirements for governance and documentation of flood preparedness and response at Penrith Lakes;	The FERP details the requirements for governance and documentation of flood preparedness and response at the site at Penrith Lakes. Site management is responsible for ensuring flood management features are implemented, regularly tested, serviced and repaired, for reviewing and updating the FERP every 5 years or following a flood that impacts the site and for ensuring the flood emergency response strategy set out in the FERP is incorporated into the Site Operational Plans for each of the 3 buildings. The actions and responsibilities for preparing and responding to a flood are set out in Section 5 of the FERP and are provided as a checklist for during a flood in Appendix A. Required flood emergency items are listed in Appendix B and a list of flood emergency contacts is included in Appendix C. Complies.
c) measures to be undertaken by occupants of the site to manage the risk to life in the event of a flood;	Measures to be undertaken to manage the flood risk to life at the site are listed in Section 4.5 of the FERP and actions to be undertaken by site occupants are set out in Section 5.3. Complies.
d) measures to be undertaken by occupants of the site to ensure the efficient evacuation of people in the event of an early flood warning;	An overview of triggers and actions for efficient early evacuation are set out in Section 4.4. Actions are provided in more detail in Section 5.3 and Appendix A of the FERP. Complies.
e) immediate flood relief and recovery actions to be undertaken by occupants of the site following a flood event or false alarm of a flood event; and	The actions to be undertaken during the recovery phase after a flood are set out in Section 5.3.4 of the FERP. Complies.



Control	Comments Pertaining to the Proposed Development
f) long-term review of systems and processes to ensure the efficient evacuation of the site and recovery measures to be undertaken	Section 5 of the FERP includes actions for ensuring the long-term review of the FERP and of the flood emergency response strategy and processes. After a flood if flooding isolated the site, inundated parts of the undercroft carpark or triggered evacuation of the site the flood event and response, including the use of the FERP and any emergency procedures, will be reviewed. The FERP also includes responsibilities and actions for review of the FERP every 5 years, regardless of whether flooding has occurred. Changes may be made to the FERP and the requirements for future emergency response should the review identify any improvements which may be made. Complies.
3.1.1 (4) Only strata or community title subdivision is permitted, unless measures compliant with provisions 2 and 3 can otherwise be demonstrated.	Subdivision of the site is not proposed. Complies.
3.1.1 (5) Despite any other provision in the DCP, the consent authority must not grant consent to a development application for development on land below the PMF in the Penrith Lakes precinct unless provisions 1, 2 and 3 are satisfied.	Provisions 1, 2 and 3 above are satisfied. Therefore, the consent authority may grant consent to the proposed development. Complies.

4 CONCLUSION

This letter has set out the flood management considerations for the proposed mixed-use tourism development at 39 – 65 Old Castlereagh Road, Castlereagh, based on the current flood-related development controls applicable to the site.

The proposed development complies with the flood-related provisions of Sections 3.1 and 3.1.1 of the DCP.

Yours sincerely

Steven Molino
Director
steven.molino@watertech.com.au
WATER TECHNOLOGY PTY LTD

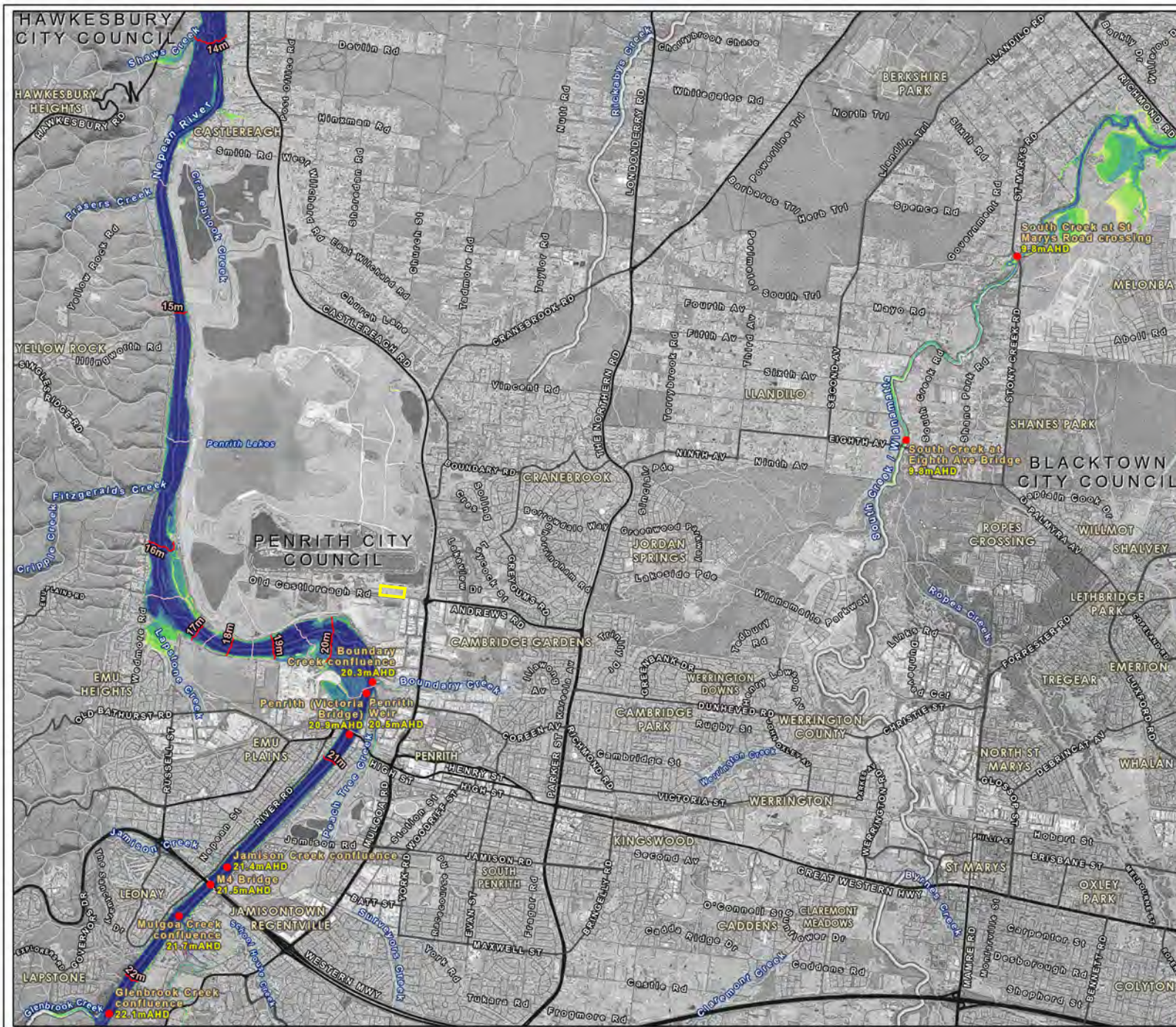
Water Technology pays respect to all First Nations peoples, their cultures and to their Elders, past and present.



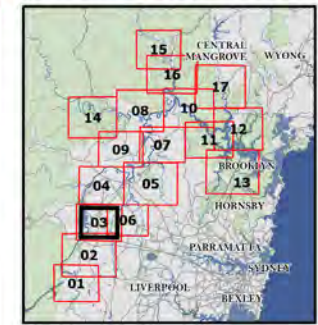
ATTACHMENT 1 | FLOOD LEVELS FOR RIVERINE FLOODING

Figures from the *Hawkesbury-Nepean River Flood Study* (NSW Reconstruction Authority, 2024)





**Hawkesbury-Nepean River
Flood Study**
Final Report - May 2024
Map-EXT02-5-03 of 17
**FLOOD EXTENTS, DEPTHS
AND CONTOURS**
1 in 5 AEP flood
(20% chance per year flood)



Legend

● Reporting location and flood level

Flood contours (m AHD)

— Flood Level Contours at 1 metre interval

— Flood Level Contours at 0.5 metre interval

Flood depths

0 - 0.3m	Site
0.3 - 0.5m	
0.5 - 1.2m	
1.2 - 2m	
2 - 4m	
4 - 6m	
>6m	

0 1,500 3,000
Metres (1:50,000 at A3)

Notes:
This map was prepared by NSW Reconstruction Authority based on the Hawkesbury-Nepean River Flood Study - Final Report, May 2024 (Rhein and CSS), and is subject to the assumptions, qualifications and limitations as well as the copyright identified in that report.

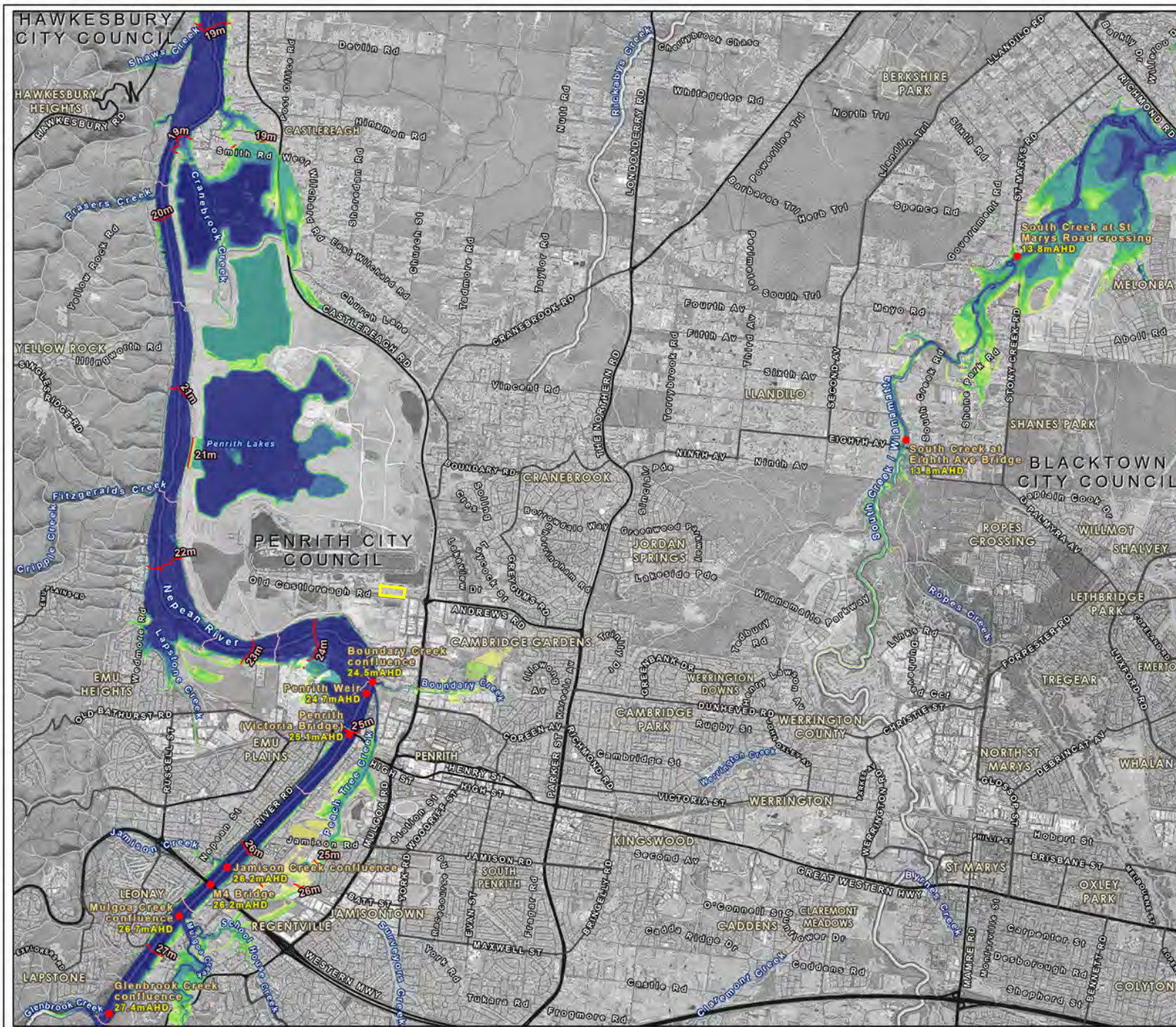
The mapped flood information represents riverine flooding of the Hawkesbury-Nepean River and associated backwater, but does not include local catchment flooding or local overland flooding. Contact your local council for information about all flood types (where available) at a property.

The flood mapping is based primarily on 2019 landform with some localised updates to mid-2020. Flood information is subject to revision as a result of changing landform, data, methods and technology.

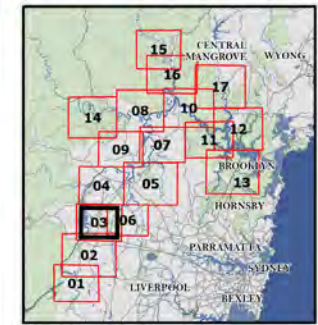
Flood level contours on this map have been simplified. The relevant digital files should be consulted for precise levels. To determine precise depths, a surveyed ground level should be compared to the flood level.

See Legal Notice in the map book cover page.

Aerial photography: Nearmap 2020-2021 and LPI NSW Imagery 2009-2016
Production Date: 7/05/2024



**Hawkesbury-Nepean River
Flood Study**
Final Report - May 2024
Map-EXT04-20-03 of 17
**FLOOD EXTENTS, DEPTHS
AND CONTOURS**
1 in 20 AEP flood
(5% chance per year flood)



Legend

- Reporting location and flood level
- Flood contours (m AHD)**
 - Flood Level Contours at 1 metre interval
 - Flood Level Contours at 0.5 metre interval
- Flood depths**
 - 0 - 0.3m
 - 0.3 - 0.5m
 - 0.5 - 1.2m
 - 1.2 - 2m
 - 2 - 4m
 - 4 - 6m
 - >6m
- Site

0 1,500 3,000
Metres (1:50,000 at A3)

Notes:
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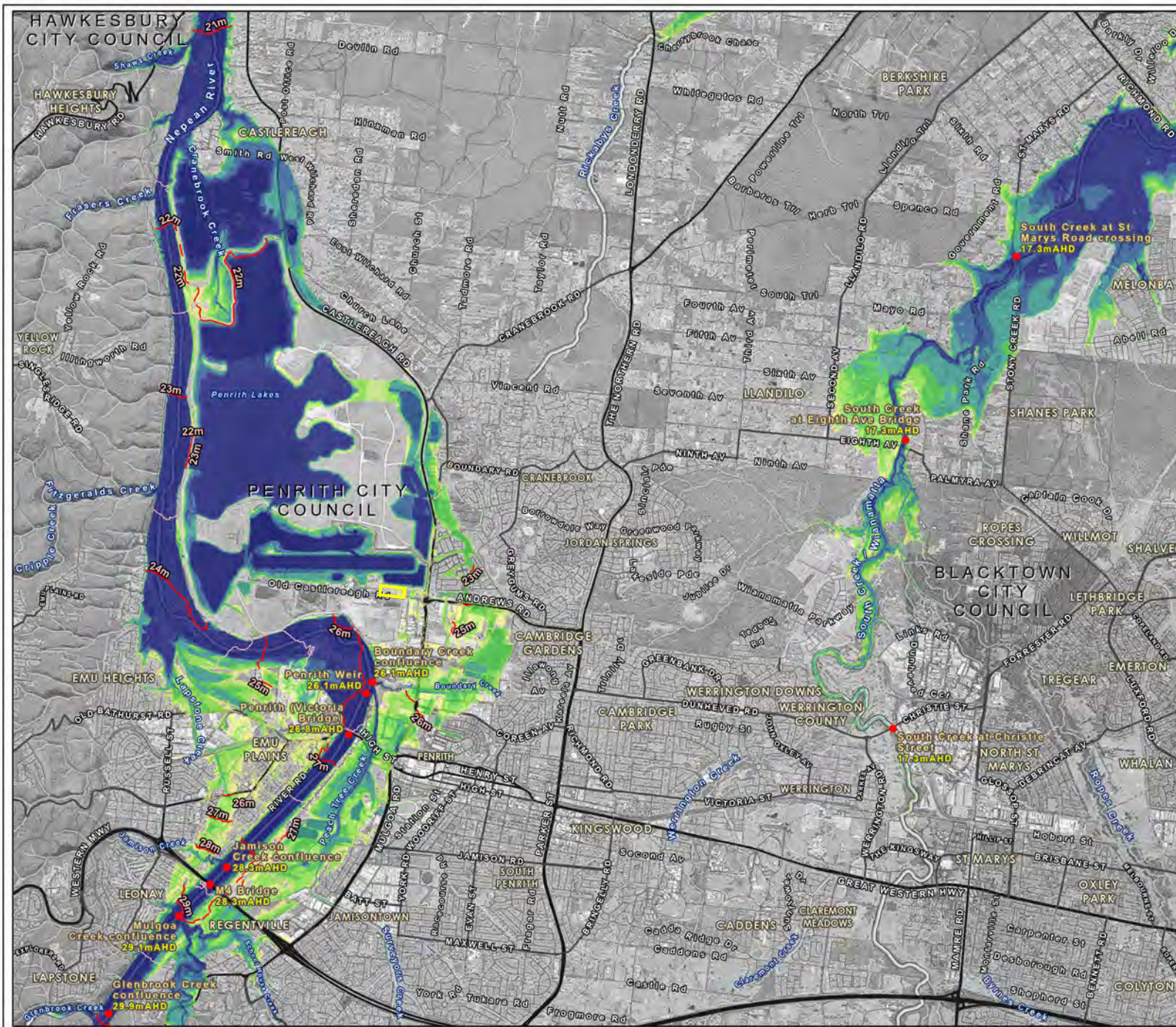
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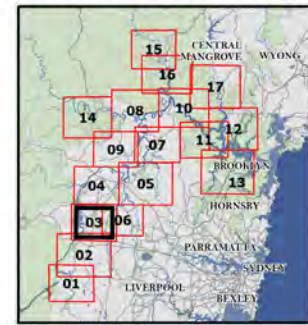
Flood level contours on this map have been simplified. The relevant digital files should be consulted for precise levels. To determine precise depths, a surveyed ground level should be compared to the flood level.

See Legal Notice in the map book cover page.

Aerial photography: Nearmap 2020-2021 and LPI NSW Imagery 2009-2016
Production Date: 7/05/2024



Hawkesbury-Nepean River Flood Study Final Report - May 2024 Map-EXT06-100-03 of 17 FLOOD EXTENTS, DEPTHS AND CONTOURS 1 in 100 AEP flood (1% chance per year flood)



Legend

- Reporting location and flood level
- Flood contours (m AHD)**
 - Flood Level Contours at 1 metre interval
 - Flood Level Contours at 0.5 metre interval
- Flood depths**
 - 0 - 0.3m
 - 0.3 - 0.5m
 - 0.5 - 1.2m
 - 1.2 - 2m
 - 2 - 4m
 - 4 - 6m
 - >6m
- Site

0 1,500 3,000
Metres (1:50,000 at A3)

Notes:
This map was prepared by NSW Reconstruction Authority based on the Hawkesbury-Nepean River Flood Study - Final Report, May 2024 (Rhein and CSS), and is subject to the assumptions, qualifications and limitations as well as the copyright identified in that report.

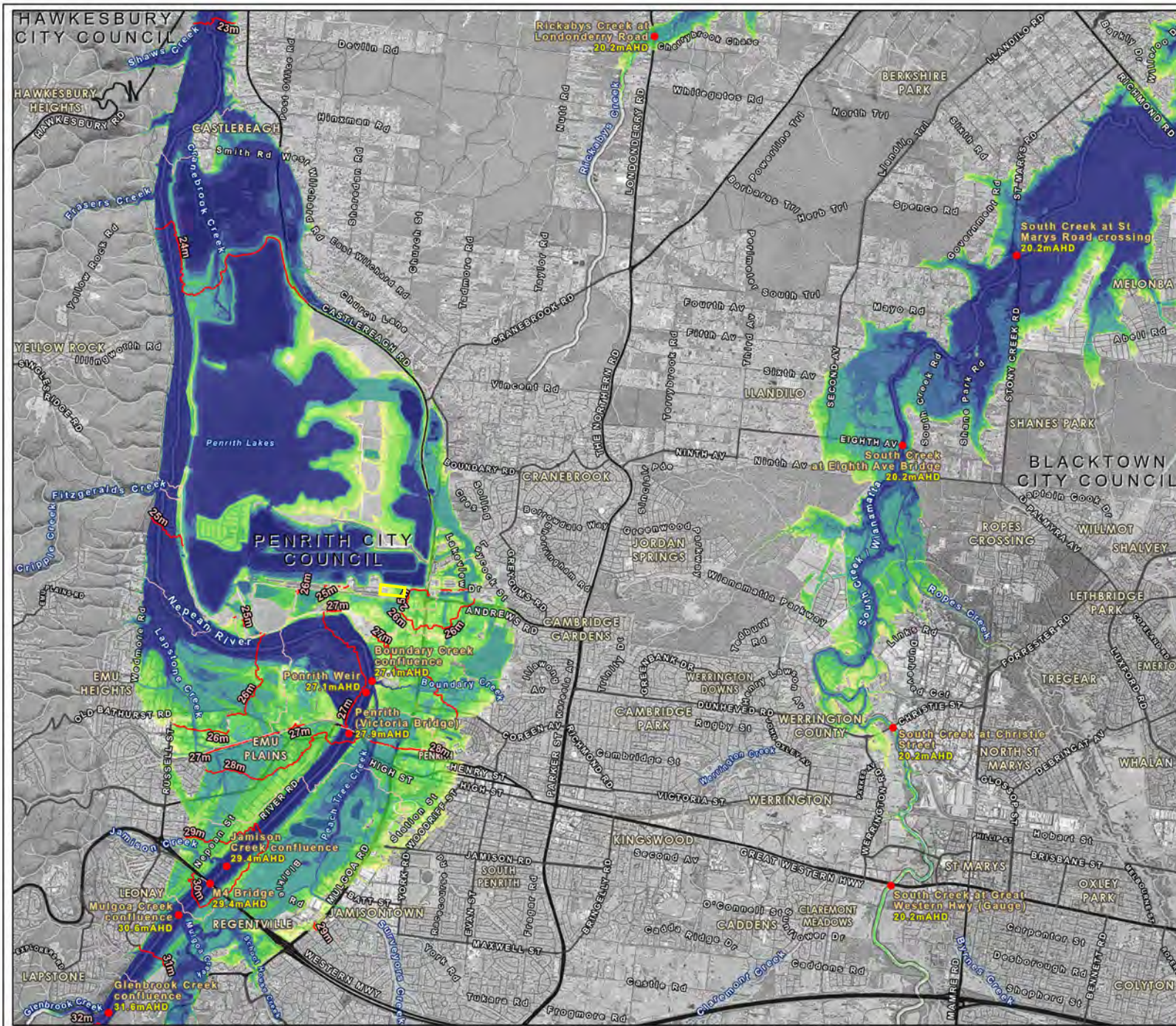
The mapped flood information represents riverine flooding of the Hawkesbury-Nepean River and associated backwater, but does not include local catchment flooding or local overland flooding. Contact your local council for information about all flood types (where available) at a property.

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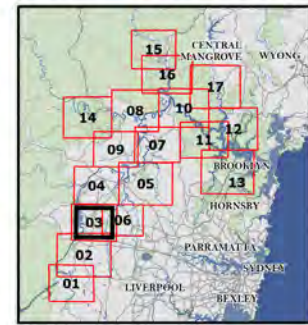
Flood level contours on this map have been simplified. The relevant digital files should be consulted for precise levels. To determine precise depths, a surveyed ground level should be compared to the flood level.

See Legal Notice in the map book cover page.

Aerial photography: Nearmap 2020-2021 and LPI NSW Imagery 2009-2016
Production Date: 30/04/2024



Hawkesbury-Nepean River Flood Study Final Report - May 2024 Map-EXT08-500-03 of 17 FLOOD EXTENTS, DEPTHS AND CONTOURS 1 in 500 AEP flood (0.2% chance per year flood)



Legend

- Reporting location and flood level
- Flood contours (m AHD)**
 - Flood Level Contours at 1 metre interval
 - Flood Level Contours at 0.5 metre interval
- Flood depths**
 - 0 - 0.3m
 - 0.3 - 0.5m
 - 0.5 - 1.2m
 - 1.2 - 2m
 - 2 - 4m
 - 4 - 6m
 - >6m
- Site

0 1,500 3,000
Metres (1:50,000 at A3)

Notes:
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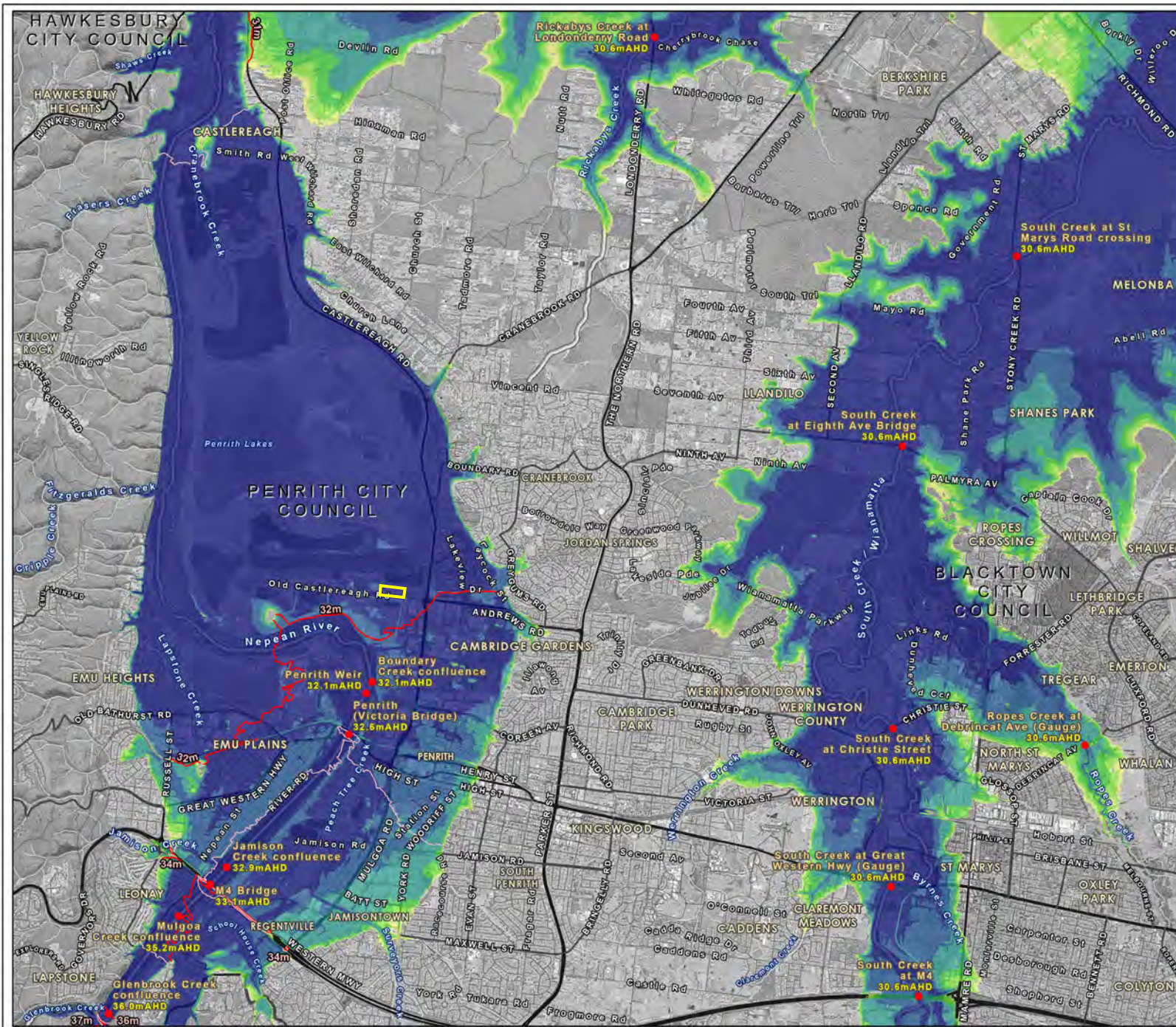
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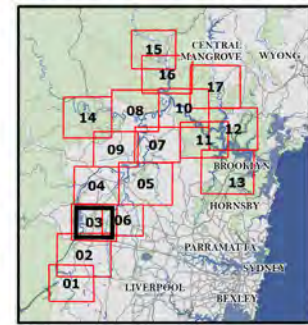
Flood level contours on this map have been simplified. The relevant digital files should be consulted for precise levels. To determine precise depths, a surveyed ground level should be compared to the flood level.

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Aerial photography: Nearmap 2020-2021 and LPI NSW Imagery 2009-2016
Production Date: 30/04/2024



**Hawkesbury-Nepean River
Flood Study**
Final Report - May 2024
Map-EXT12-PMF-03 of 17
**FLOOD EXTENTS, DEPTHS
AND CONTOURS**
Probable Maximum Flood (PMF)



Legend

- Reporting location and flood level
- Flood contours (m AHD)**
 - Flood Level Contours at 1 metre interval
 - Flood Level Contours at 0.5 metre interval
- Flood depths**
 - 0 - 0.3m
 - 0.3 - 0.5m
 - 0.5 - 1.2m
 - 1.2 - 2m
 - 2 - 4m
 - 4 - 6m
 - >6m
- Site

0 1,500 3,000
Metres (1:50,000 at A3)

Notes:
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Flood level contours on this map have been simplified. The relevant digital files should be consulted for precise levels. To determine precise depths, a surveyed ground level should be compared to the flood level.

See Legal Notice in the map book cover page.

Aerial photography: Nearmap 2020-2021 and LPI NSW Imagery 2009-2016
Production Date: 30/04/2024



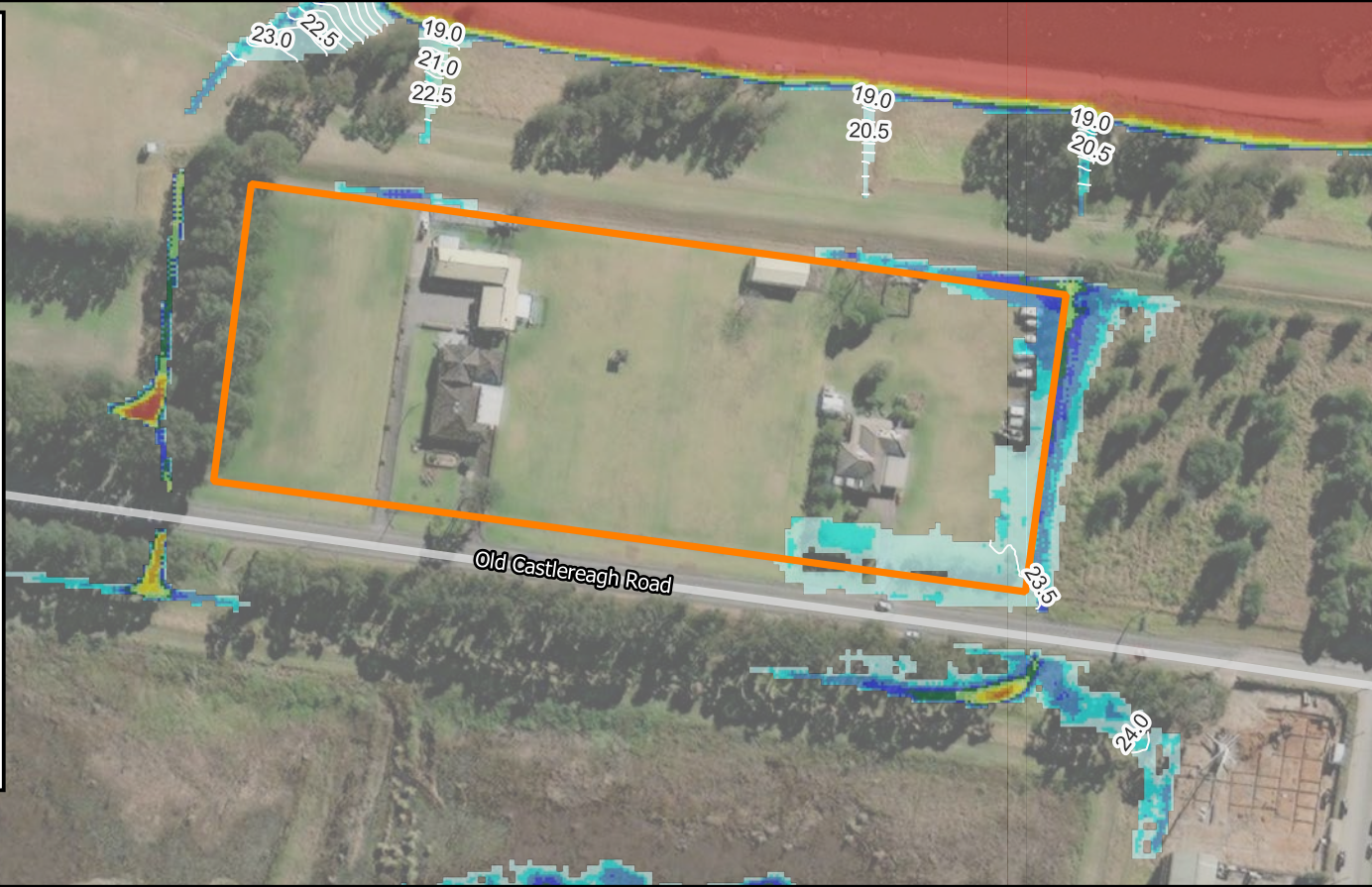
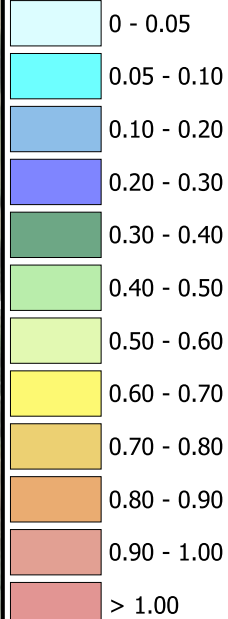
ATTACHMENT 2 | FLOOD LEVELS FOR OVERLAND FLOODING



Legend

 Site

Flood Depth (m)

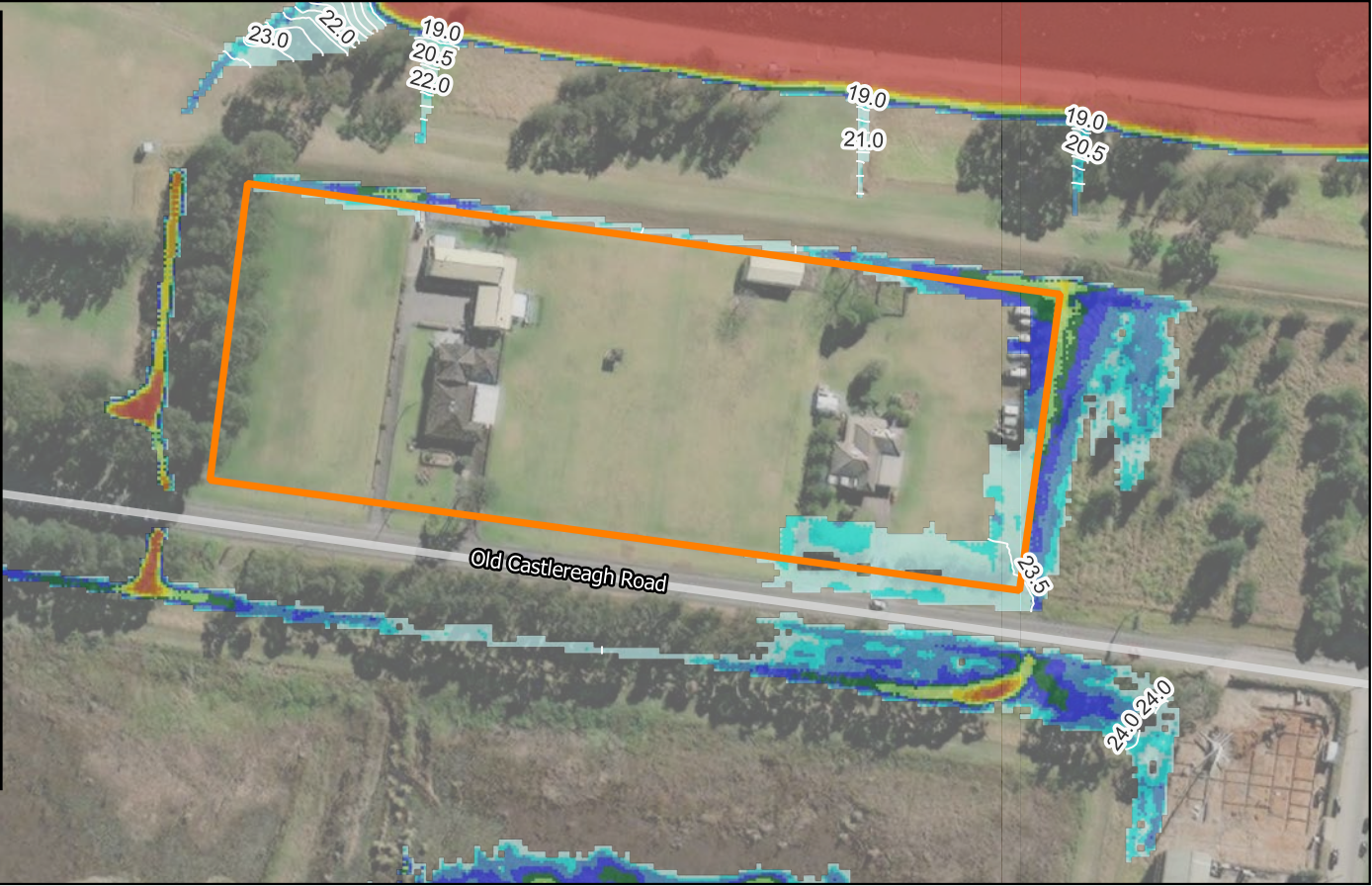
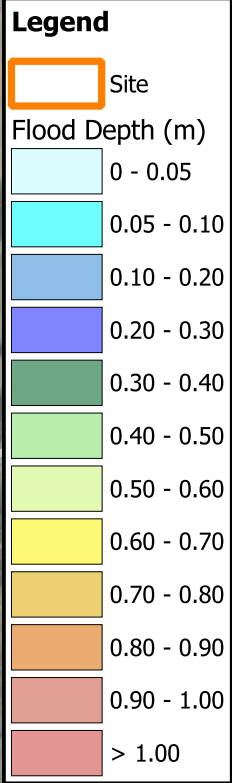


0 50 100 m

24050074 - 39-65 Old Castlereagh Road

20% AEP Flood - Overland
Flood Level and Depth





0 50 100 m

24050074 - 39-65 Old Castlereagh Road

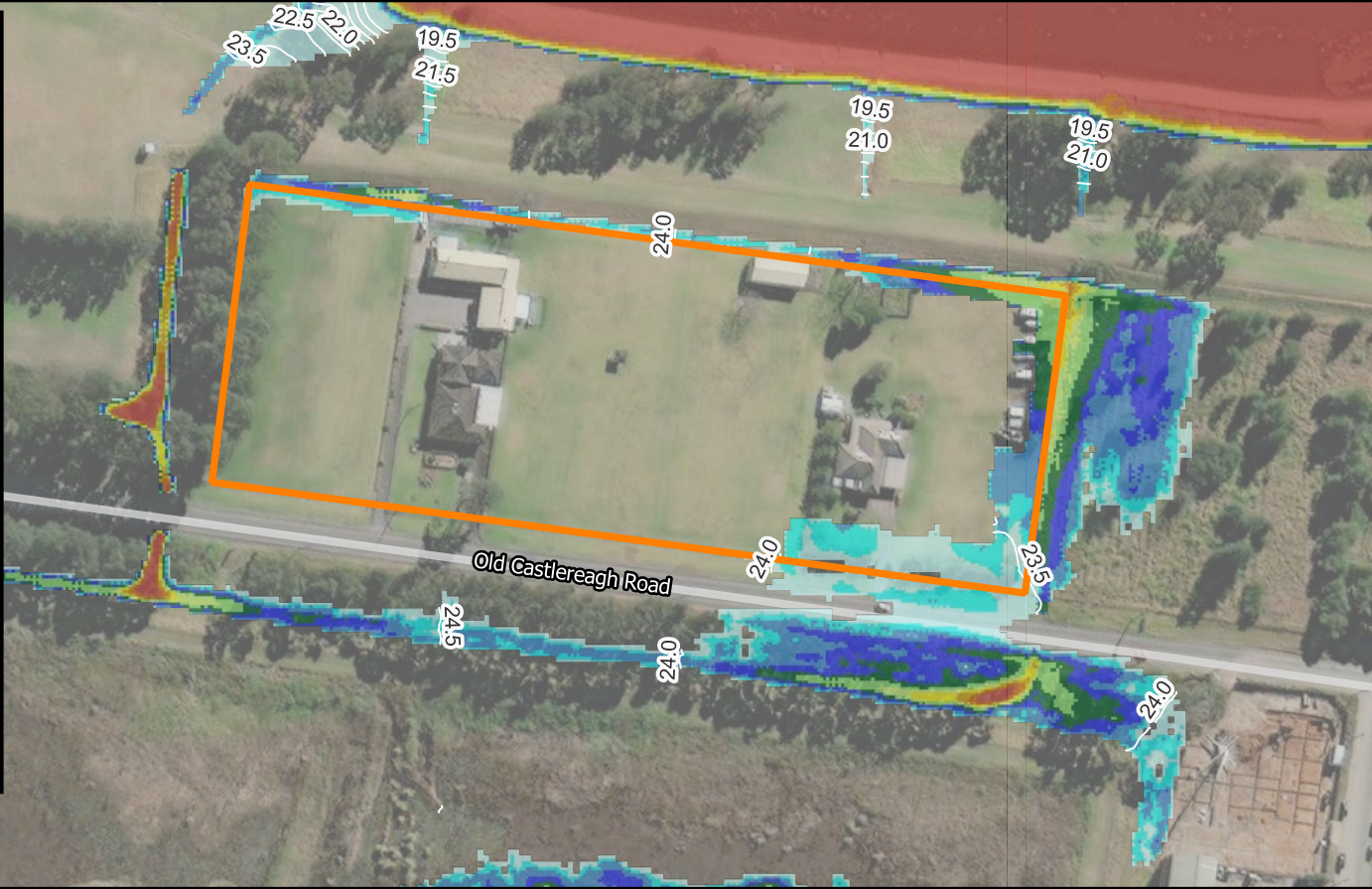
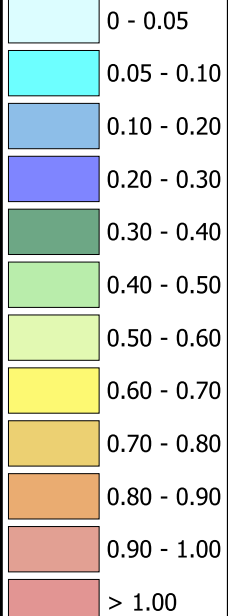
5% AEP Flood - Overland
Flood Level and Depth



Legend

 Site

Flood Depth (m)



0 50 100 m

24050074 - 39-65 Old Castlereagh Road

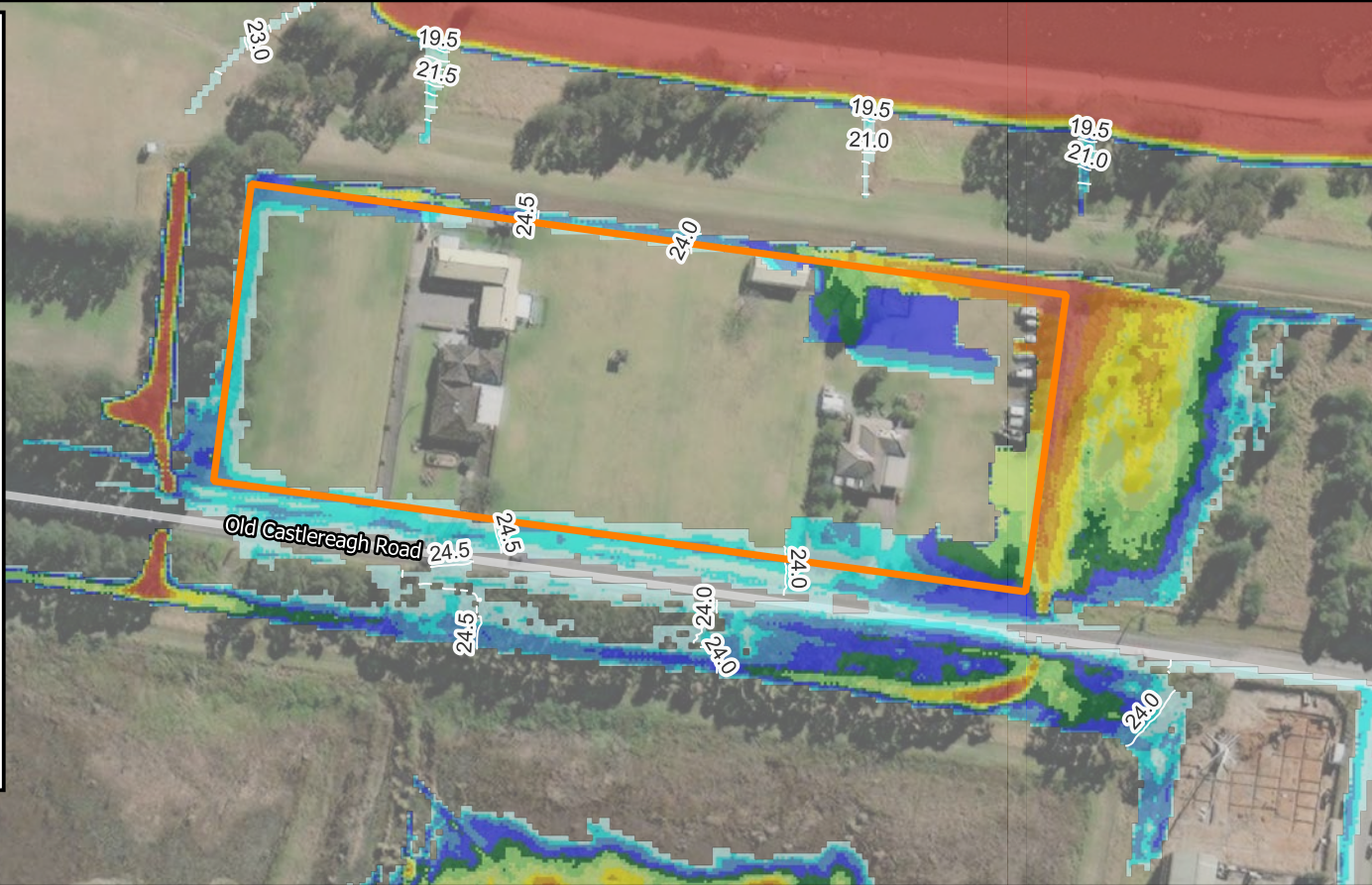
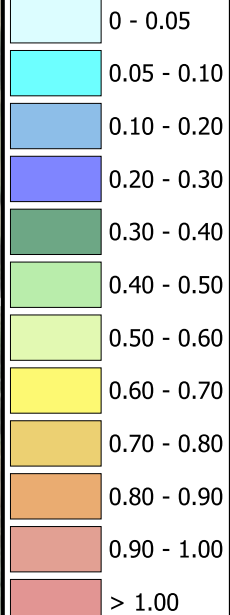
1% AEP Flood - Overland
Flood Level and Depth



Legend

 Site

Flood Depth (m)



0 50 100 m

24050074 - 39-65 Old Castlereagh Road
0.2% AEP Flood - Overland
Flood Level and Depth



Legend

Site

Flood Depth (m)

0 - 0.05

0.05 - 0.10

0.10 - 0.20

0.20 - 0.30

0.30 - 0.40

0.40 - 0.50

0.50 - 0.60

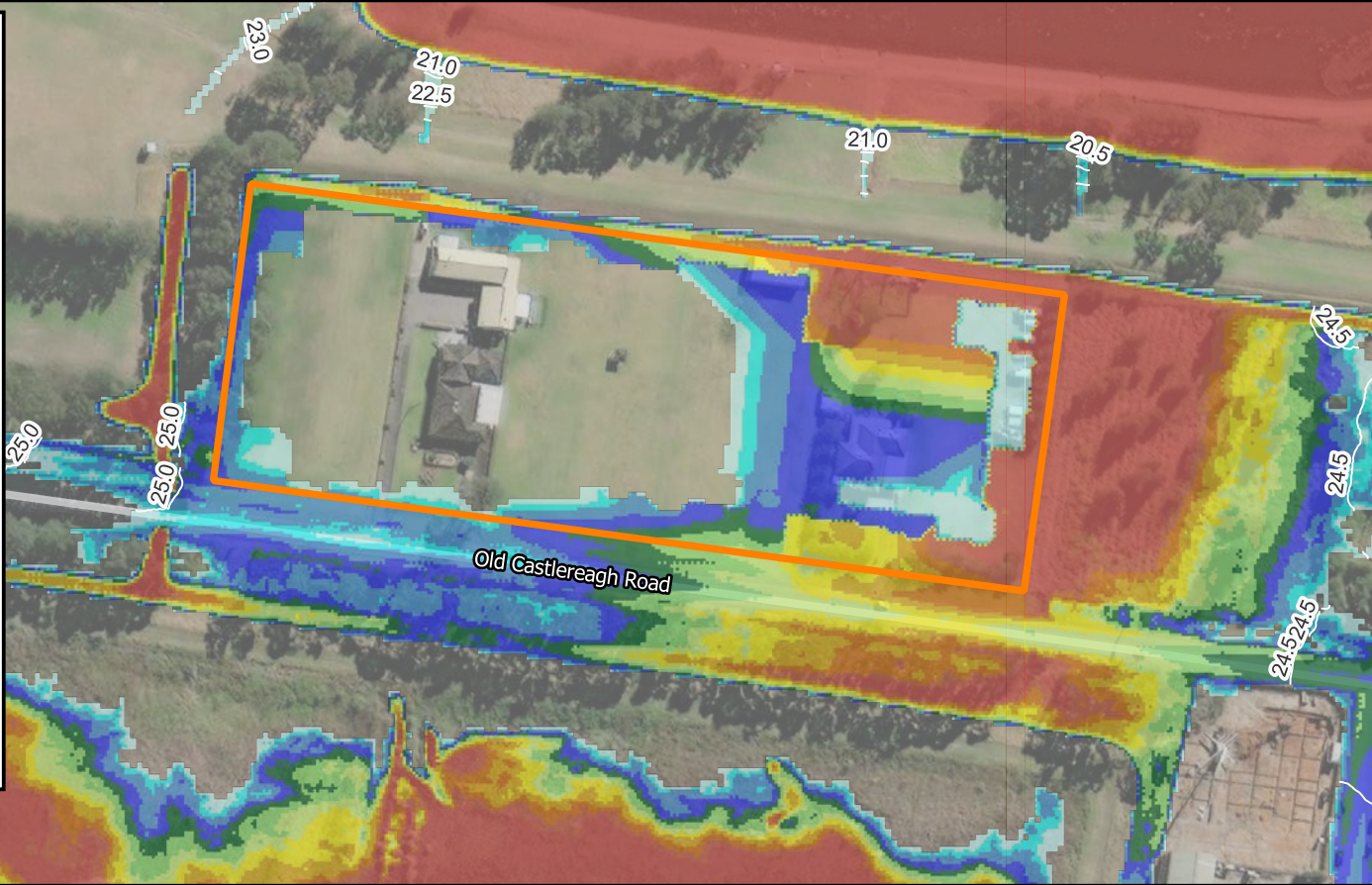
	0.60 - 0.70
--	-------------

0.70 - 0.80

0.80 - 0.90

0.90 - 1.00

> 1.00



24050074 - 39-65 Old Castlereagh Road

PMF - Overland Flood Level and Depth

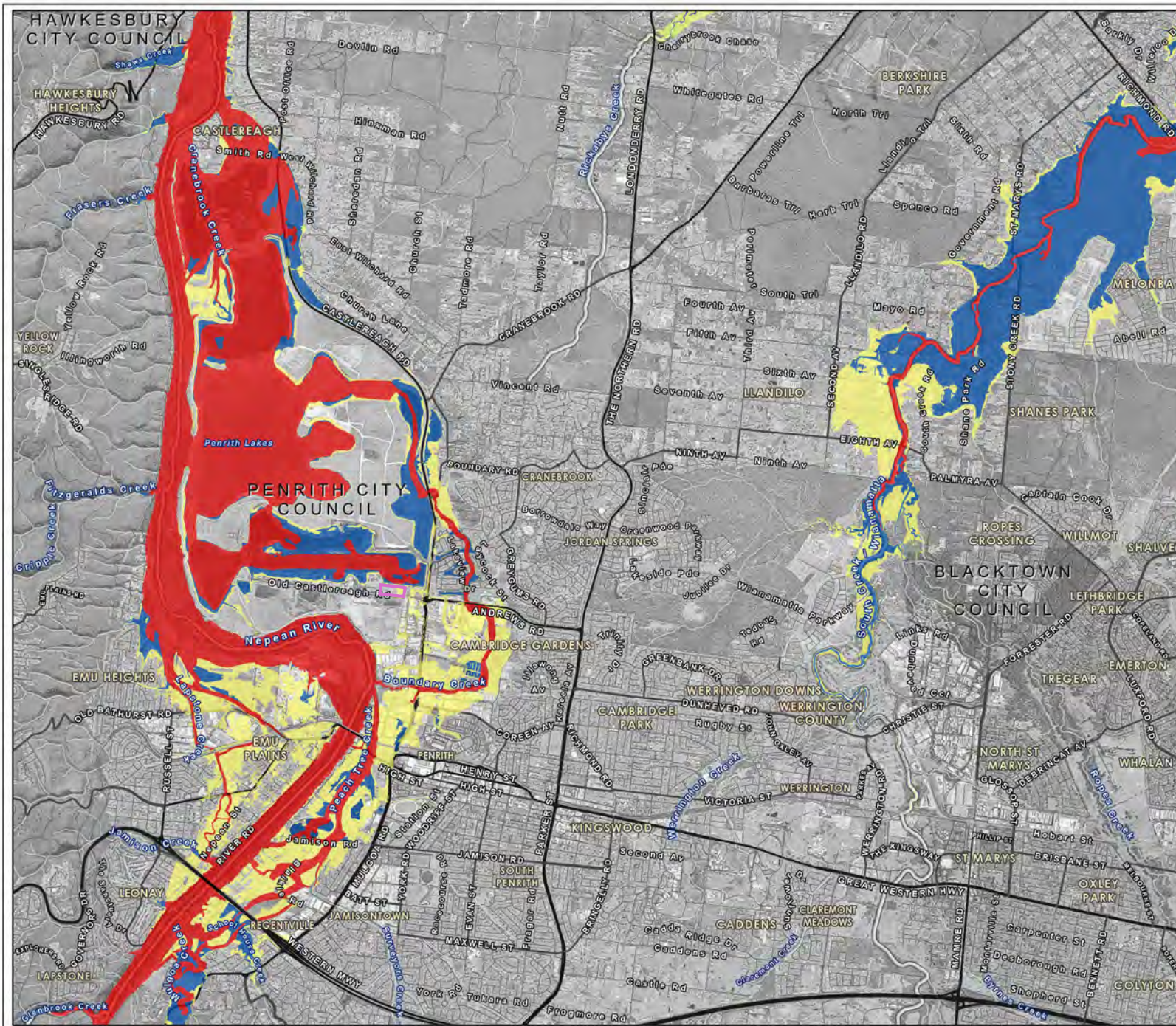




ATTACHMENT 3 | FLOOD FUNCTION

Figures from the *Hawkesbury-Nepean River Flood Study* (NSW Reconstruction Authority, 2024)

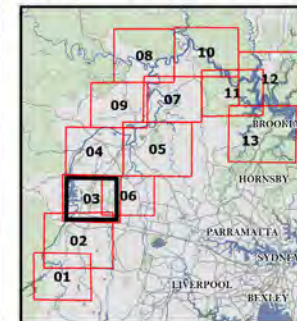




Hawkesbury-Nepean River Flood Study

Final Report - May 2024
Map-FLF02-100-03 of 13

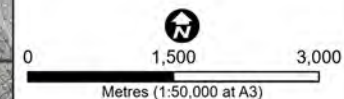
FLOOD FUNCTION 1 in 100 AEP flood (1% chance per year flood)



Legend

Flood function

- Floodway
- Flood Storage
- Flood Fringe
- Site



Notes:
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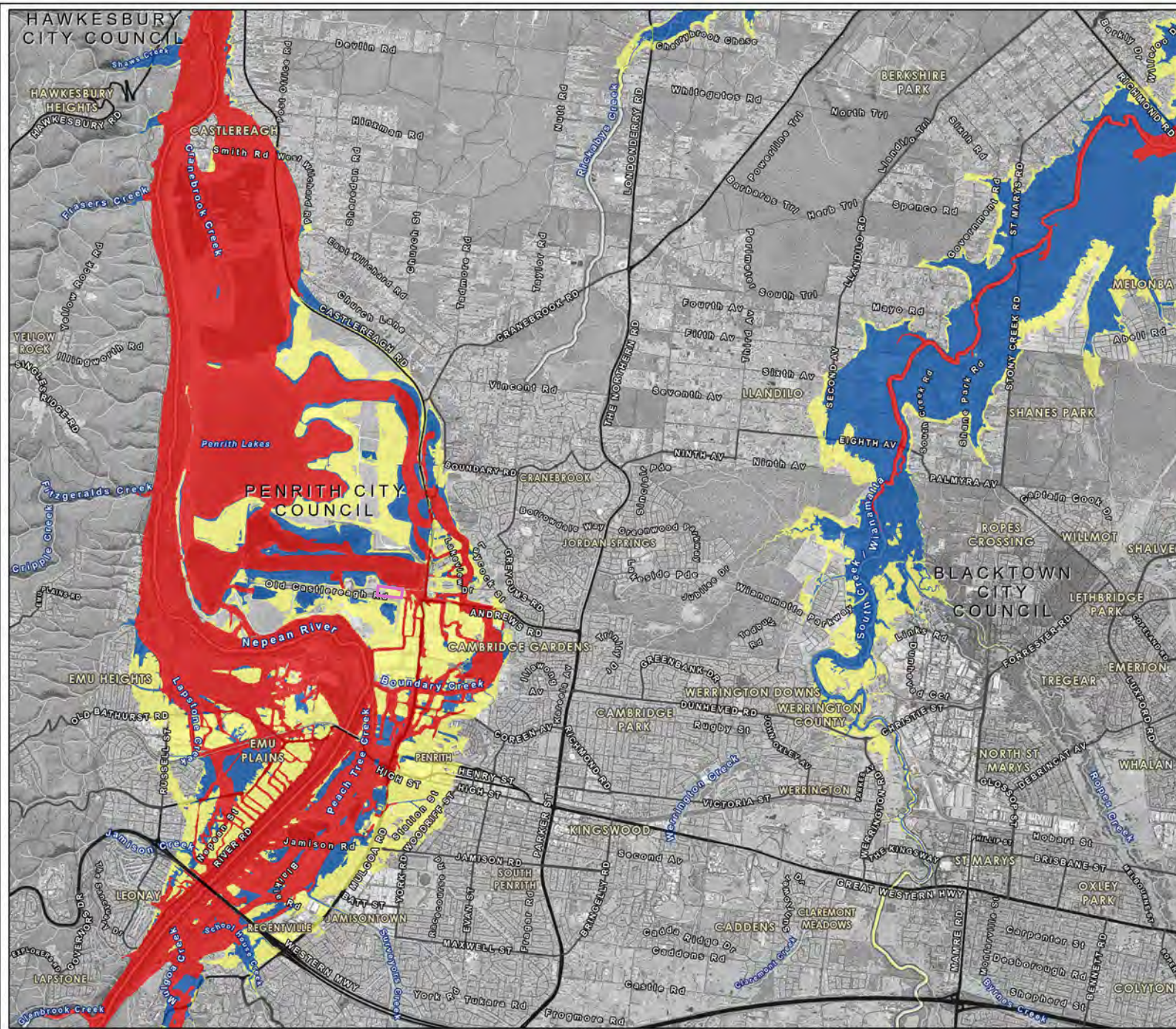
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The flood mapping is based primarily on 2019 landform with some localised updates to mid-2020. Flood information is subject to revision as a result of changing landform, data, methods and technology.

Flood function categories are as defined in the Hawkesbury-Nepean River Flood Study Technical Volume 11.

See Legal Notice in the map book cover page.

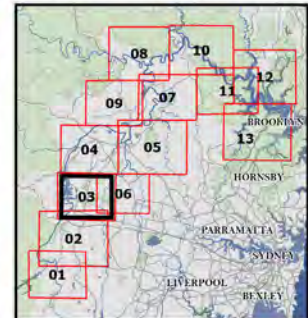
Aerial photography: Nearmap 2020-2021 and LPI NSW Imagery 2009-2018
Production Date: 29/04/2024



**Hawkesbury-Nepean River
Flood Study**
Final Report - May 2024
Map-FLF04-500-03 of 13

FLOOD FUNCTION

**1 in 500 AEP flood
(0.2% chance per year flood)**



Legend

Flood function

- Floodway
- Flood Storage
- Flood Fringe

Site

0 1,500 3,000
Metres (1:50,000 at A3)

Notes:
This map was prepared by NSW Reconstruction Authority based on the Hawkesbury-Nepean River Flood Study - Final Report, May 2024 (Rhelm and CSS), and is subject to the assumptions, qualifications and limitations as well as the copyright identified in that report.

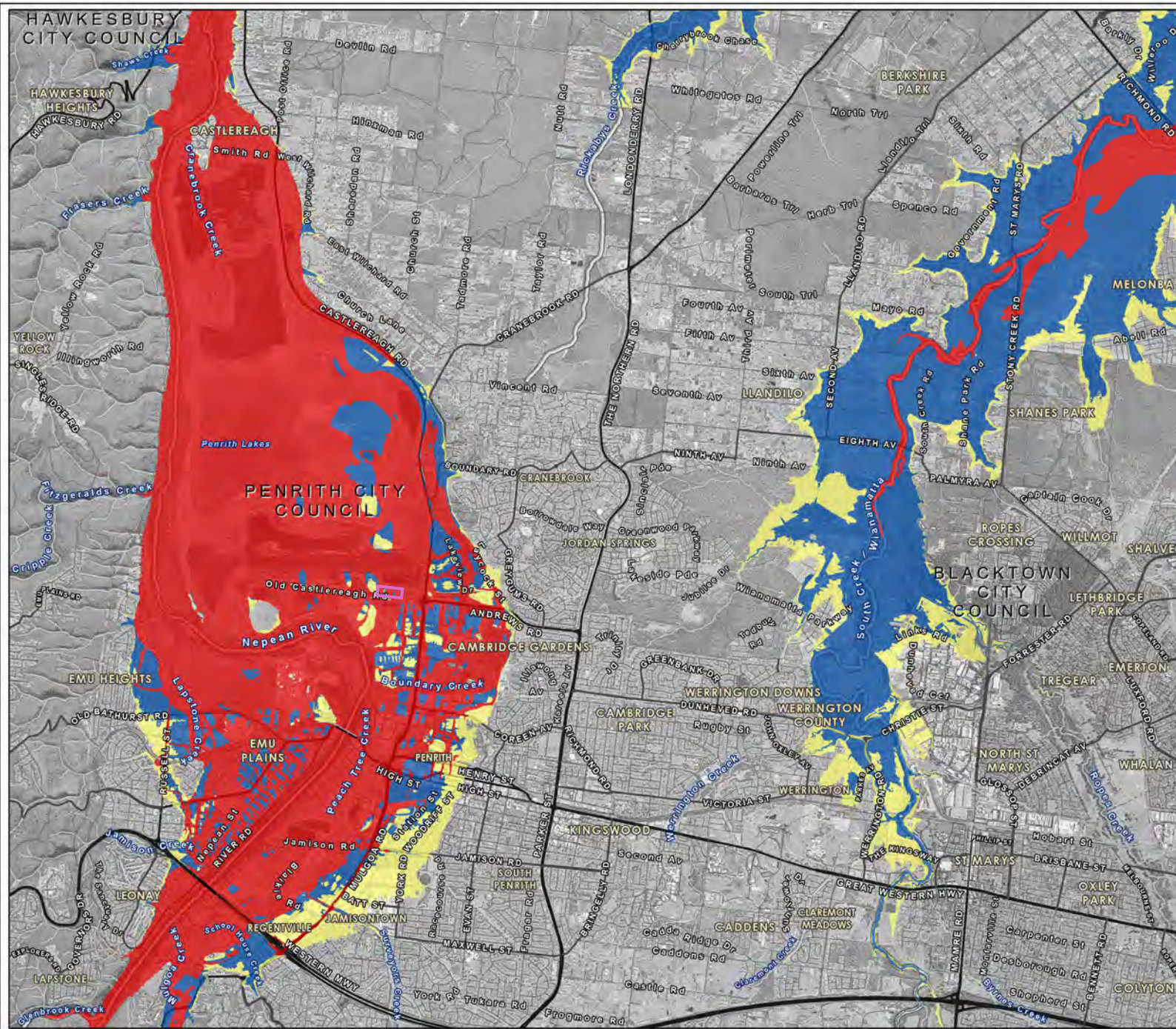
The mapped flood information represents riverine flooding of the Hawkesbury-Nepean River and associated backwater, but does not include local catchment flooding or local overland flooding. Contact your local council for information about all flood types (where available) at a property.

The flood mapping is based primarily on 2019 landform with some localised updates to mid-2020. Flood information is subject to revision as a result of changing landform, data, methods and technology.

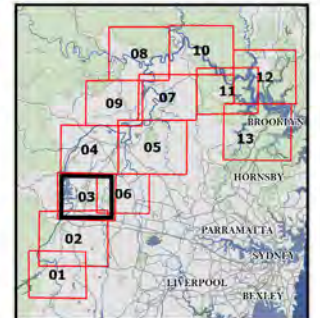
Flood function categories are as defined in the Hawkesbury-Nepean River Flood Study Technical Volume 11.

See Legal Notice in the map book cover page.

Aerial photography: Neamap 2020-2021 and LPI NSW Imagery 2009-2018
Production Date: 29/04/2024



**Hawkesbury-Nepean River
Flood Study**
Final Report - May 2024
Map-FLF05-2000-03 of 13
FLOOD FUNCTION
1 in 2,000 AEP flood
(0.05% chance per year flood)



Legend

Flood function

- Floodway
- Flood Storage
- Flood Fringe

Site

0 1,500 3,000
Metres (1:50,000 at A3)

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Production Date: 29/04/2024