Torrent Consulting Pty Ltd
86 Blanch Street
Shortland NSW 2307

ABN 11 636 418 089

www.torrentconsulting.com.au

Our Ref: DJW: L.T2166.002.docx

11 November 2021
Digby Rayward
c/o Perception Planning
PO Box 107
Clarence Town NSW 2321
Attention: Peta Harris

Dear Peta

RE: FLOOD RISK ASSESSMENT FOR PROPOSED SUBDIVISION OF 83 FOTHERINGAY ROAD, CLARENCE TOWN NSW

Background

Torrent Consulting was engaged to undertake a Flood Risk Assessment to assist in the approval process for the subdivision of 83 Fothringay Road, Clarence Town NSW (the Site). This Site is located on the right floodplain of the Williams River, on the downstream side of Clarence Town, as presented in Figure 1.

The topography of the local floodplain is presented in Figure 2. This shows that the Williams River floodplain is principally located on the eastern side of the channel at the Site. However, there are low-lying areas within the Site, where small local tributary catchments enter the Williams River.

With the relative size of the Williams River and local tributary catchments, flood risk is a function of mainstream flooding from the Williams River. The existing design flood conditions for this flood mechanism are detailed in the Williams River Flood Study (BMT WBM, 2009). Information contained in this study will be used to summarise the existing flood conditions and risks in the context of the Site, together with any constraints and required floodplain risk management measures for future development of the Site.

Flood Risk Mapping

The modelled flood levels presented in the Williams River Flood Study are around 6.7 m AHD for the 5% AEP event, 7.9 m AHD for the 1% AEP event and 13.9 m AHD for the PMF event. These flood levels have been used in conjunction with the LPI LiDAR survey data to map peak flood extents for the 5% AEP, 1% AEP and PMF events, as presented in Figure 3 together with the proposed Site lot layout. The Flood Planning Area (FPA) is also mapped at a level of 8.4 m AHD, which is the 1% AEP flood level plus a 0.5 m freeboard.

Figure 4, Figure 5, and Figure 6 are presented for additional flooding context and show the mapped peak flood depths for the 5% AEP, 1% AEP and PMF events, respectively.

Figure 7, Figure 8, and Figure 9 present the flood hazard classification at the Site for the 5% AEP, 1% AEP and PMF events, respectively. The flood hazards have been determined in accordance with Guideline 7-3 of the Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (AIDR, 2017). This produces a six-tier hazard classification, based on modelled flood depths, velocities and velocity-depth product. The hazard classes relate directly to the potential risk posed to people, vehicles, and buildings, as presented in Chart 1.

The flood hazard mapping is useful for providing context to the nature of the modelled flood risk and to identify potential constraints for development of the Site with regards to floodplain risk management. The principal consideration of good practice floodplain risk management is to ensure compatibility of development with the flood hazard of the land, including the risk to life and risk to property.

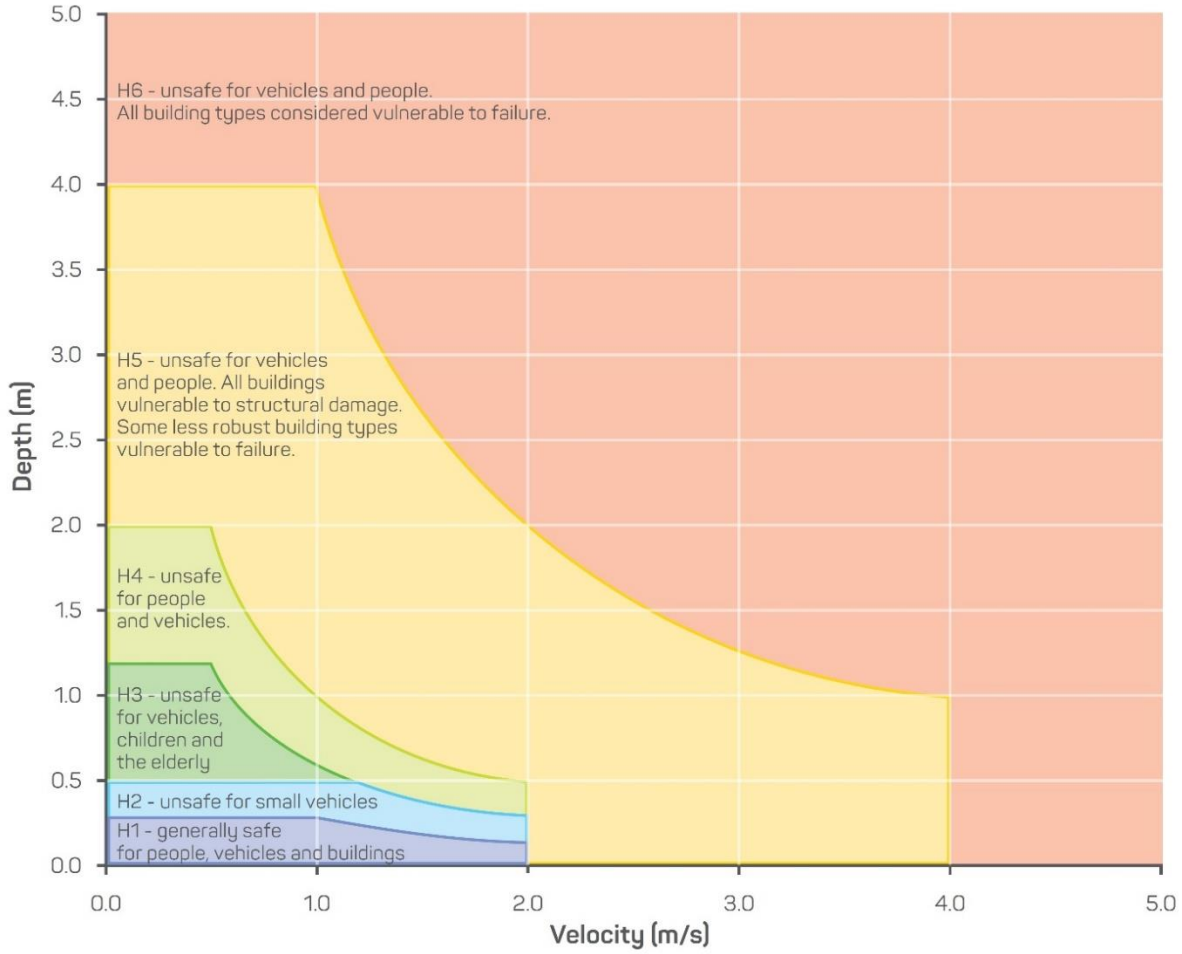


Chart 1 – General Flood Hazard Vulnerability Curves (AIDR, 2017)

Flood Risk Management

The principal consideration of good practice floodplain risk management is to ensure compatibility of the proposed development with the flood hazard of the land, including the risk to life and risk to property. Requirements within a Council's LEP (Local Environment Plan) and DCP (Development Control Plan) typically consider the management of flood risk, with the application of an FPL (Flood Planning Level) being the principal control measure. The standard FPL for residential development in NSW is the 1% AEP flood level plus a 0.5 m freeboard. However, requirements for non-residential development can vary significantly.

The proposed Lot 1 is heavily constrained by flooding, with limited opportunity for development. Proposed lots 2 to 5 can be accessed from the existing driveway and each have extensive areas above the FPL, a large proportion of which is also above the PMF level. Proposed lot 6 includes the existing dwelling and again has an extensive area above the FPL, a large proportion of which is also above the PMF level.

Any proposed future dwellings within the subdivided lots can (and should) be located outside of the FPA and so no specific flood development controls will need to be satisfied beyond those relating to the subdivision. The requirements of Council's DCP relating to subdivision are:

- The development must not obstruct or divert flood waters to or from neighbouring properties
- Consideration is required regarding an appropriate flood evacuation strategy & pedestrian / vehicular access route for both before and during a flood
- Notification is placed on title of the lots being subject to flood planning controls.

Given the context of the floodplain topography and minor scale of potential development, the diversion or obstruction of flood waters impacting neighbouring properties is not considered to be a significant concern.

The principal floodplain risk management consideration for the proposed subdivision and ultimate residential development is the requirement for flood evacuation / access. These requirements can be satisfied through a suitable flood emergency response. The topography of the Site provides a rising access between the proposed subdivided lots (and potential future dwellings) to flood-free land above the PMF, along the alignment of the existing driveway. Therefore, risk to life from flooding in a very rare to extreme flood event is readily managed as safe and self-sufficient evacuation from the Site is readily achieved. However, a Flood Emergency Response Plan is still recommended, to improve education and awareness of flood risk for future residents.

Flood Emergency Response

Homeowners in flood-affected areas are encouraged to prepare a Flood Emergency Response Plan (FERP). The NSW SES (State Emergency Service) provides an online tool (http://www.seshomeemergencyplan.com.au/) for homeowners to complete a Home Emergency Plan, covering risks such as floods, storms, tsunamis and bushfires. Most of the content can (and should) be completed by the homeowner. However, details relating to the specific hazards cannot be readily produced, with information suggested to be sourced from government authorities where available. This section of the review therefore provides relevant flood information to support the development of a Home Emergency Plan to manage flood risk.

The main impact of flooding on future residents of the Site is likely to be temporary isolation from the community, through flood inundation of local roads. Therefore, it can be important to ensure that properties are stocked to accommodate a period of isolation of a few days.

Residents at the Site should pay attention to any Flood Watch or Flood Warnings issued by the Australian Bureau of Meteorology (BoM).

The BoM incorporates the Williams River at Mill Dam Falls gauge into its operational flood warning network. Water level data for the Mill Dam Falls gauge can be accessed at: http://www.bom.gov.au/fwo/IDN60232/IDN60232.061339.plt.shtml, which presents the current recorded water level at the gauge together with the recorded data over the past five days. The Minor, Moderate and Major flood warning levels are also provided and are summarised in Table 1.

All gauge records and warnings are provided as heights in metres above the gauge zero reading, which is surveyed at 0.825 m AHD. As the Mill Dam Falls gauge is only around 11 km upstream of the Site it provides a good reference for expected local flood conditions, with the BoM actively monitoring forecast

storm events and recorded rainfall. The NSW State Flood Plan (2015) provides a target flood warning time of 12 hours prior to a flood event on the Williams River.

Table 1 – Williams River at Mill Dam Falls Flood Warning Levels

Warning Level	Gauge Height (m)	Gauge Flood Level (m AHD)
Minor	6.1	6.9
Moderate	7.6	8.4
Major	9.1	9.9

The Site may become isolated from Clarence Town and further afield for flood events in the order of a 5% AEP. This is a rarer event than the Major flood level at Mill Dam Falls.

As well as the option to relocate from the Site during a period of flooding, the advanced flood warning afforded by the Mill Dam Falls gauge would also enable the option to leave the Site to acquire essential provisions, returning prior to the Site becoming isolated.

Homeowners in flood-affected areas are encouraged to prepare a Flood Emergency Response Plan (FERP). The NSW SES (State Emergency Service) provides an online tool (http://www.seshomeemergencyplan.com.au/) for homeowners to complete a Home Emergency Plan, covering risks such as floods, storms, tsunamis and bushfires. Most of the content can (and should) be completed by the homeowner. However, details relating to the specific hazards cannot be readily produced, with information suggested to be sourced from government authorities where available. However, this document provides relevant flood information to support the development of a Home Emergency Plan to manage flood risk.

Residents at the Site should pay attention to any Flood Watch or Flood Warnings issued by the Australian Bureau of Meteorology (BoM). In the event of a flood emergency response being initiated by the SES, residents and guests should follow the instructions given accordingly. This may include an order to evacuate to a designated flood evacuation centre, if required. However, during such an event State emergency services would likely be stretched, and homeowners should be prepared to respond to a flood emergency without assistance.

To ensure timely flood warning in advance of a potential loss of Site access, homeowners can set themselves up to receive RSS (Really Simple Syndication) feeds from the BoM New South Wales & ACT Warning service. Alerts are automatically provided to subscribed devices when the feed is updated. This can be set up for both home computers and mobile phones and is customisable (refer http://www.bom.gov.au/rss/rss-guide.shtml). Warnings issued for the Williams River can then be monitored, with real-time gauge data for Mill Dam Falls available for viewing at http://www.bom.gov.au/fwo/IDN60232/IDN60232.061339.plt.shtml.

Conclusion

Torrent Consulting was engaged to undertake a Flood Risk Assessment to assist in the approval process for the subdivision of 83 Fothringay Road, Clarence Town NSW.

Design flood information has been sourced from the Williams River Flood Study and used to assess flood risk at the Site in the context of the proposed subdivision.

Any proposed future dwellings within the subdivided lots can (and should) be located outside of the FPA and so no specific flood development controls will need to be satisfied beyond those relating to the subdivision.

With regards to flood affectation the Site, the context of the floodplain topography and minor scale of potential development, the diversion or obstruction of flood waters impacting neighbouring properties is not considered to be a significant concern.

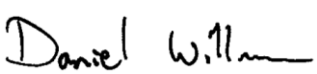
The requirements for flood evacuation / access, flood awareness and management & design can be satisfied through a suitable flood emergency response. The topography of the Site provides a rising access between the proposed subdivided lots (and potential future dwellings) to flood-free land above the PMF, along the alignment of the existing driveway. Therefore, risk to life from flooding in a very rare to extreme flood event is readily managed as safe and self-sufficient evacuation from the Site is readily achieved.

A Flood Emergency Response Plan is recommended, to improve education and awareness of flood risk for future residents. Information informing a suitable flood emergency response is provided within this report.

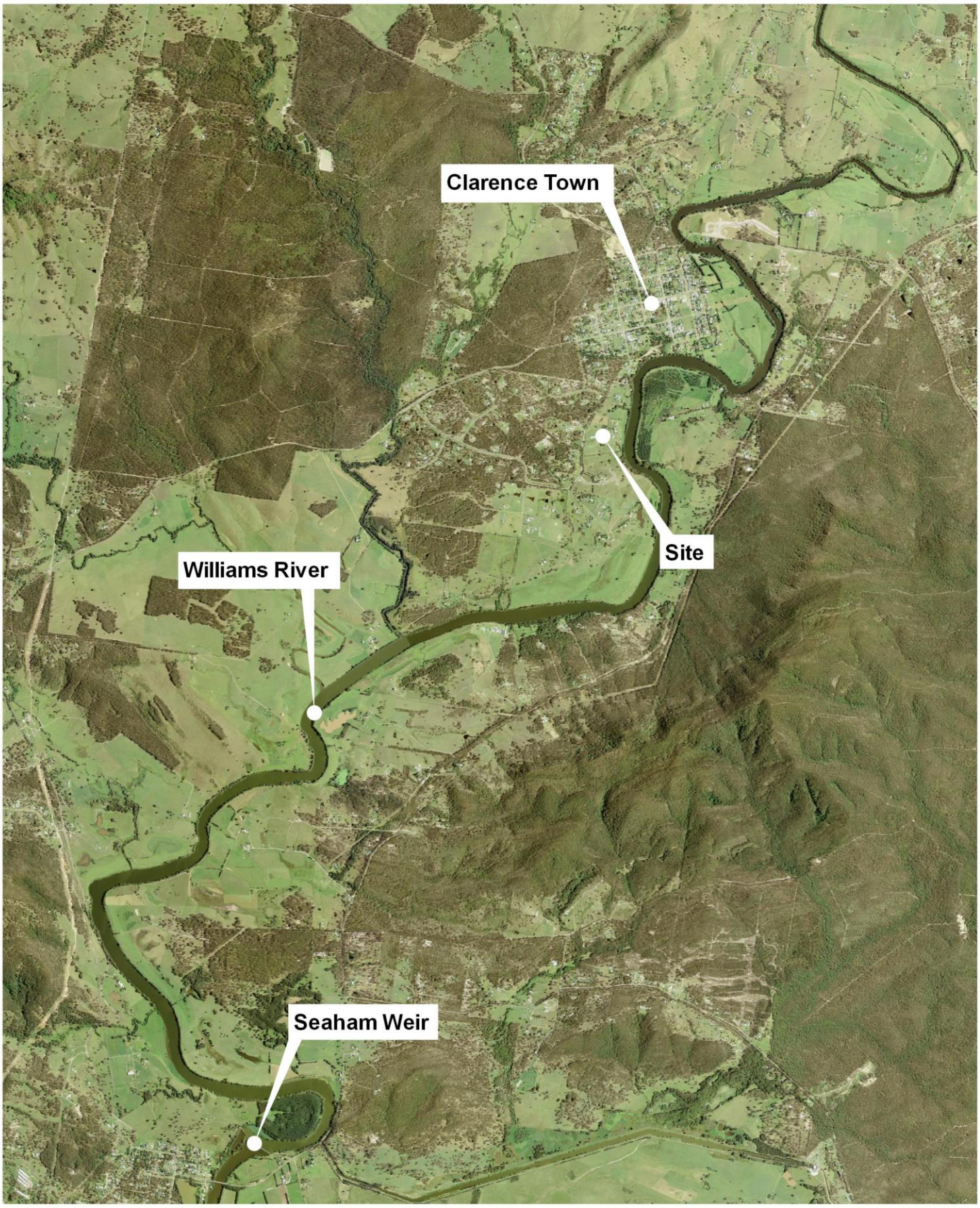
We trust that this report meets your requirements. For further information or clarification please contact the undersigned.

Yours faithfully

Torrent Consulting



Dan Williams
Director



Title:

Study Locality

0 1 2 km

approx. scale

Figure: 1

Revision: A

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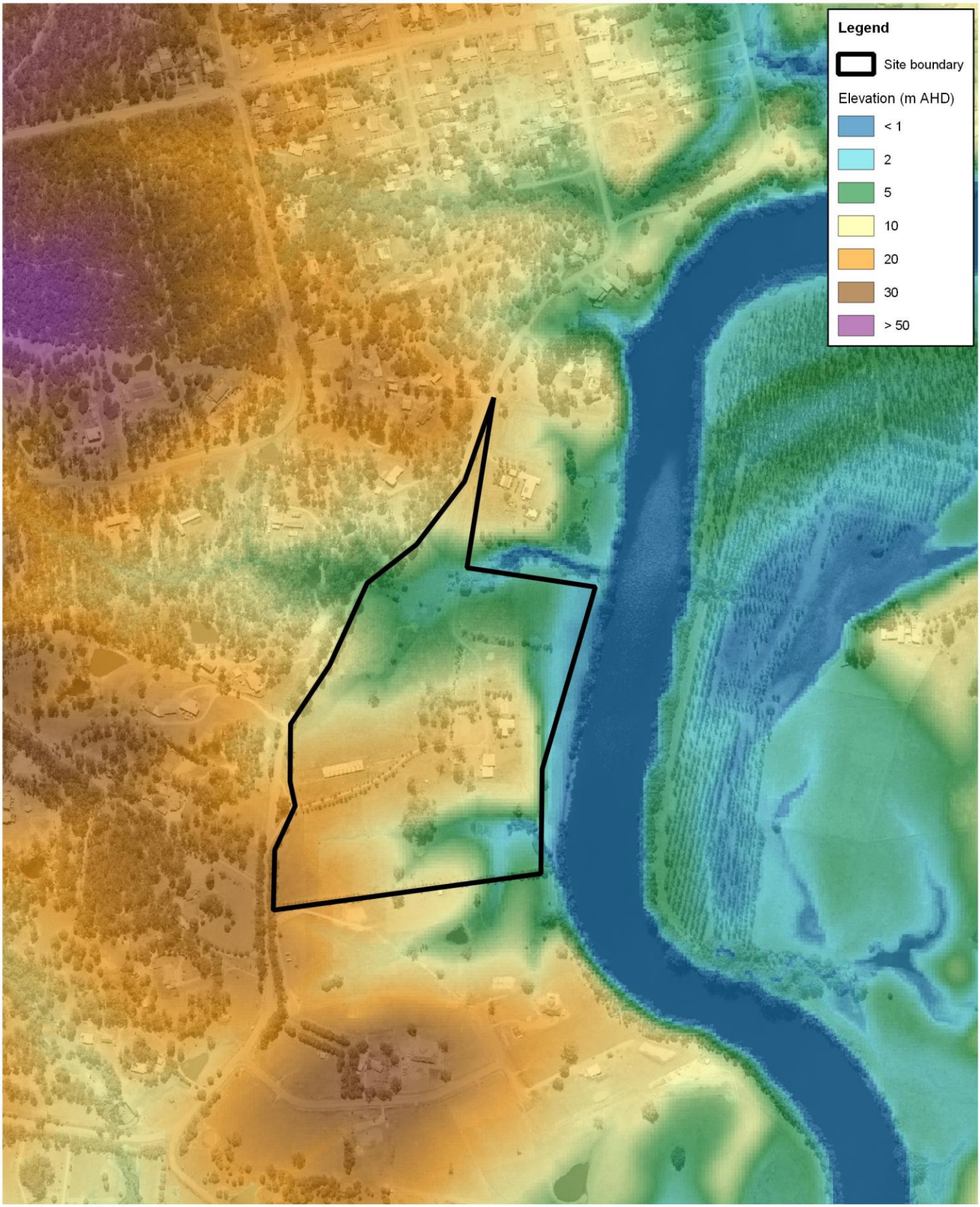

Title:

Local Floodplain Topography

0 100 200 m

approx. scale

Figure: 2

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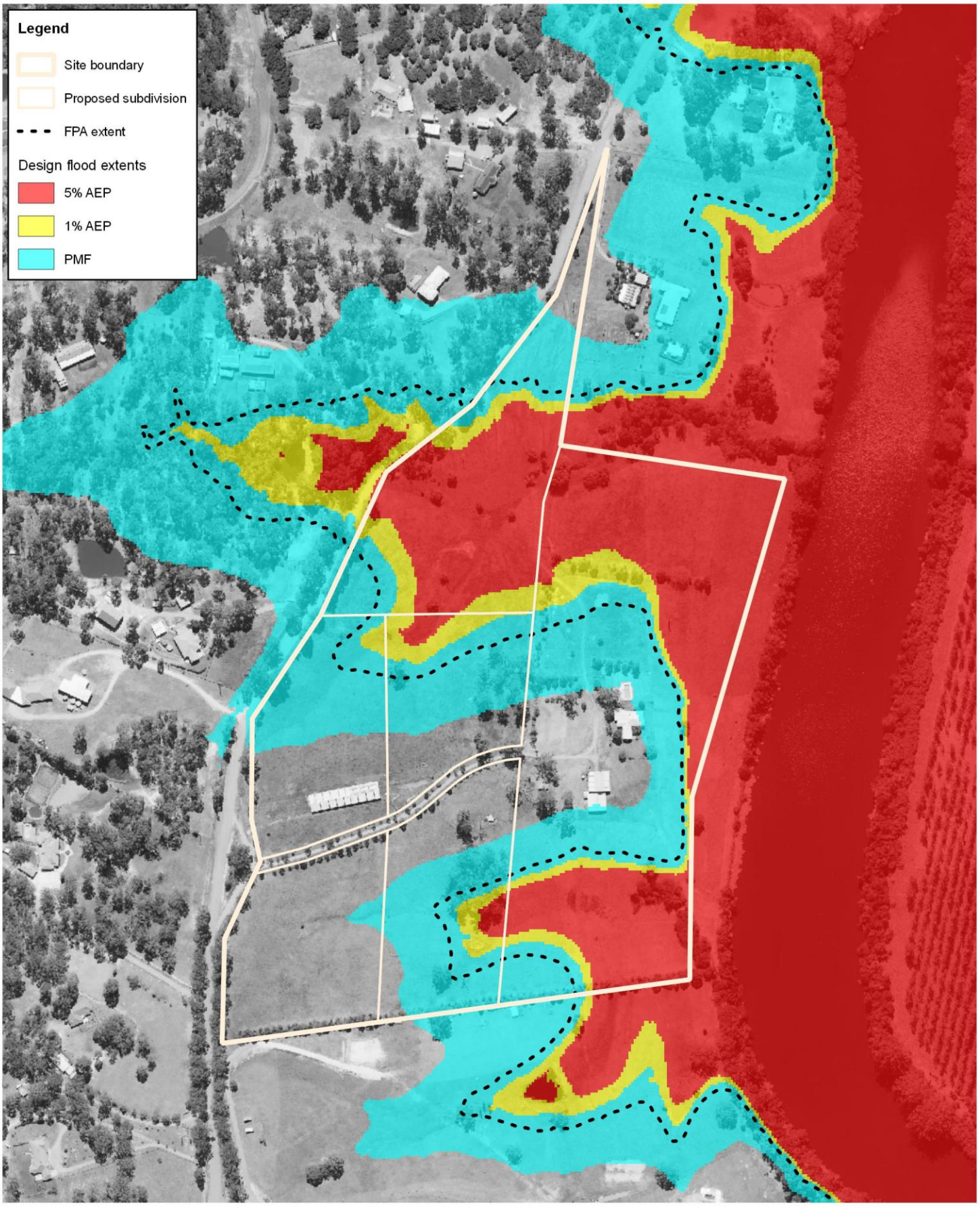

Title:

Williams River Design Flood Extents

0 100 200 m

approx. scale

Figure: 3

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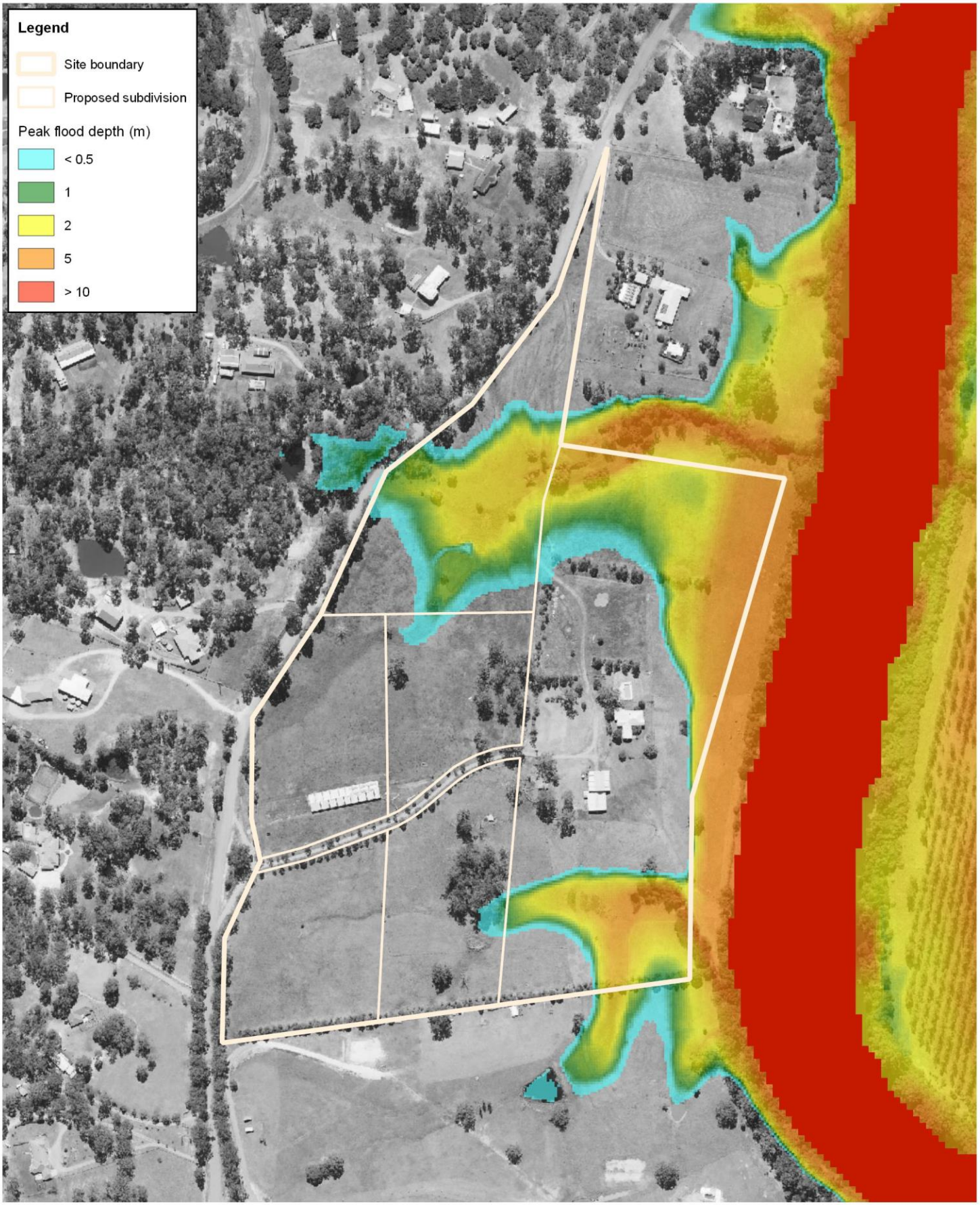

Title:

Williams River 5% AEP Flood Depth

0 100 200 m

approx. scale

Figure: 4

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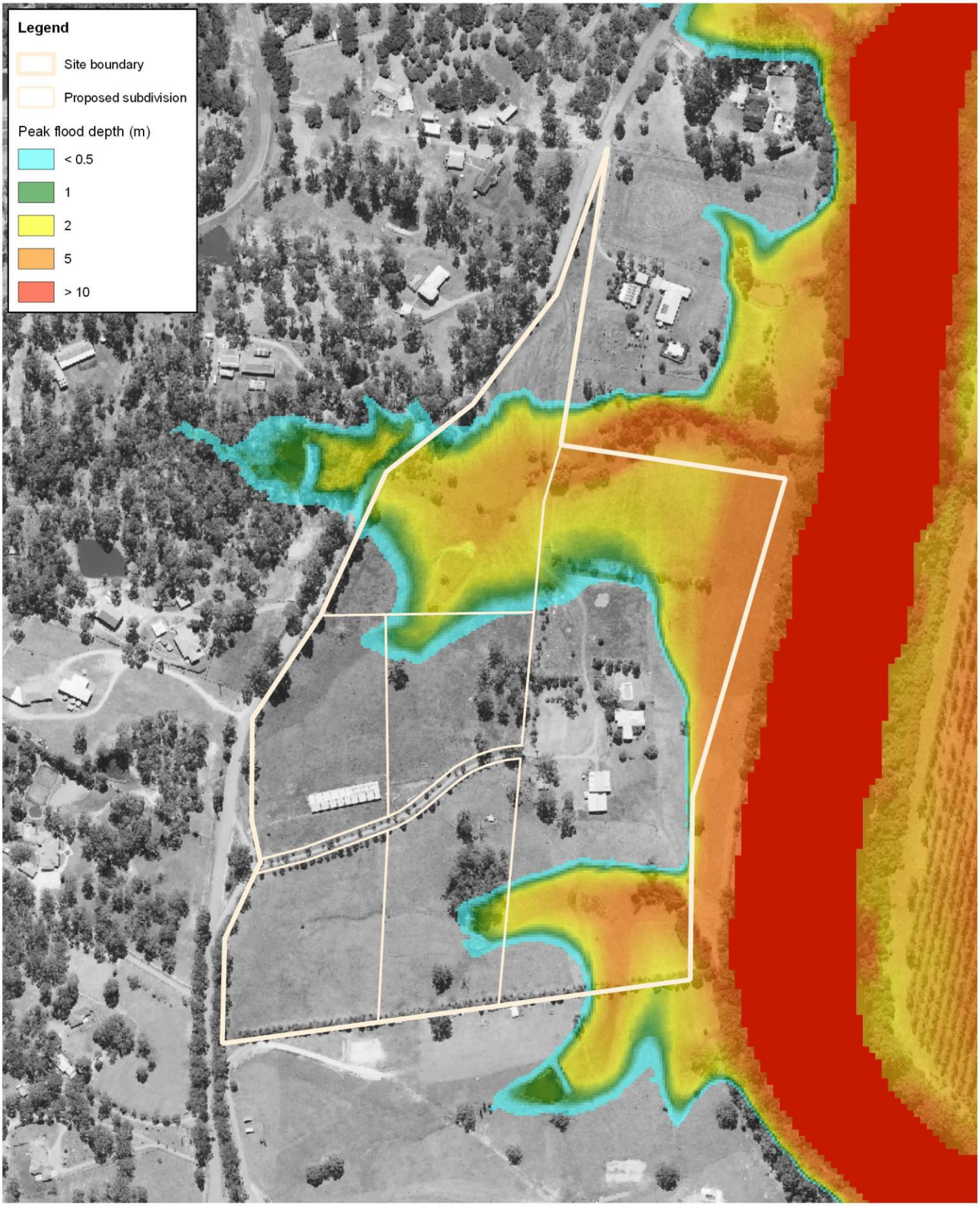

Title:

Williams River 1% AEP Flood Depth

0 100 200 m

approx. scale

Figure: 5

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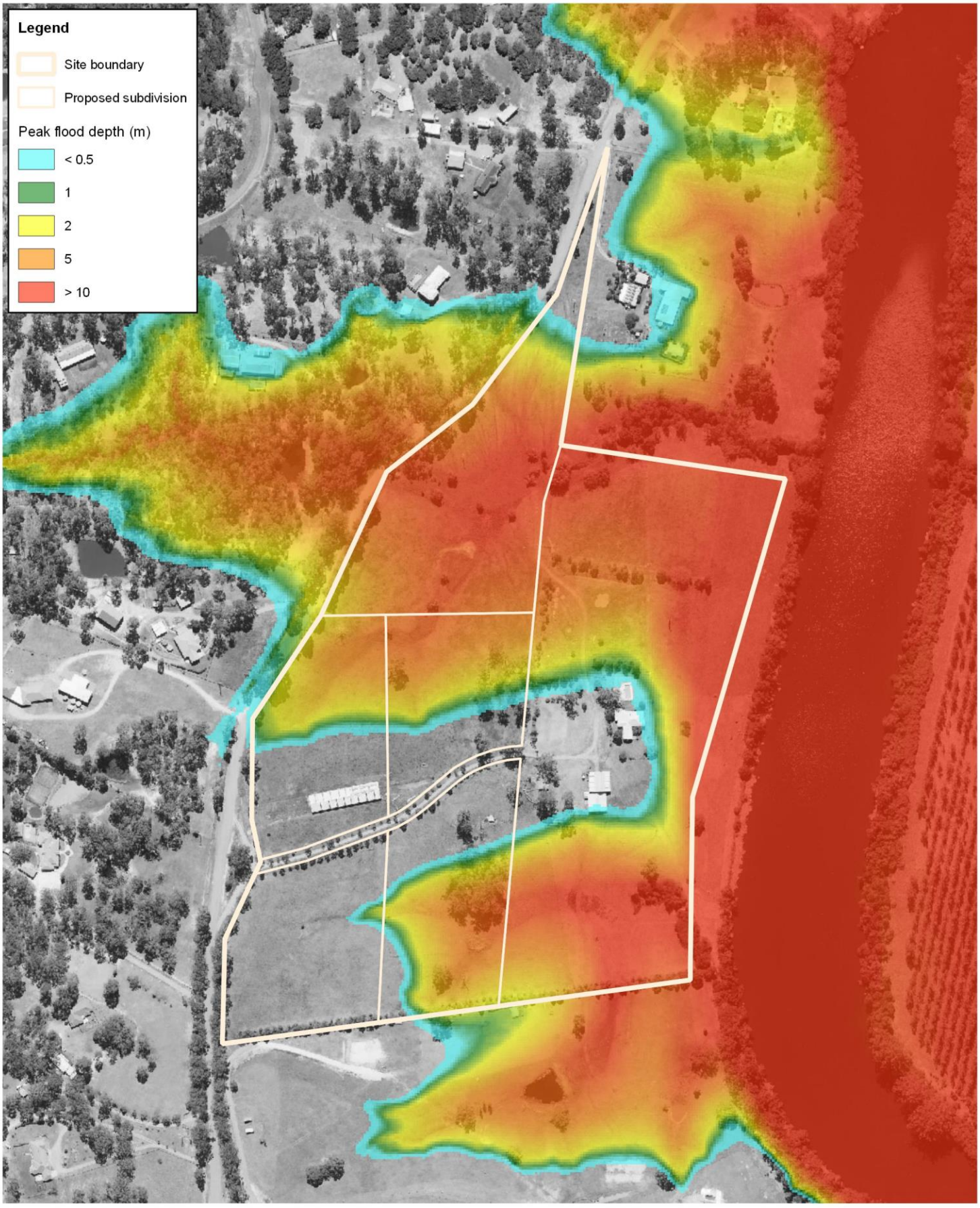

Title:

Williams River PMF Flood Depth

0 100 200 m

approx. scale

Figure: 6

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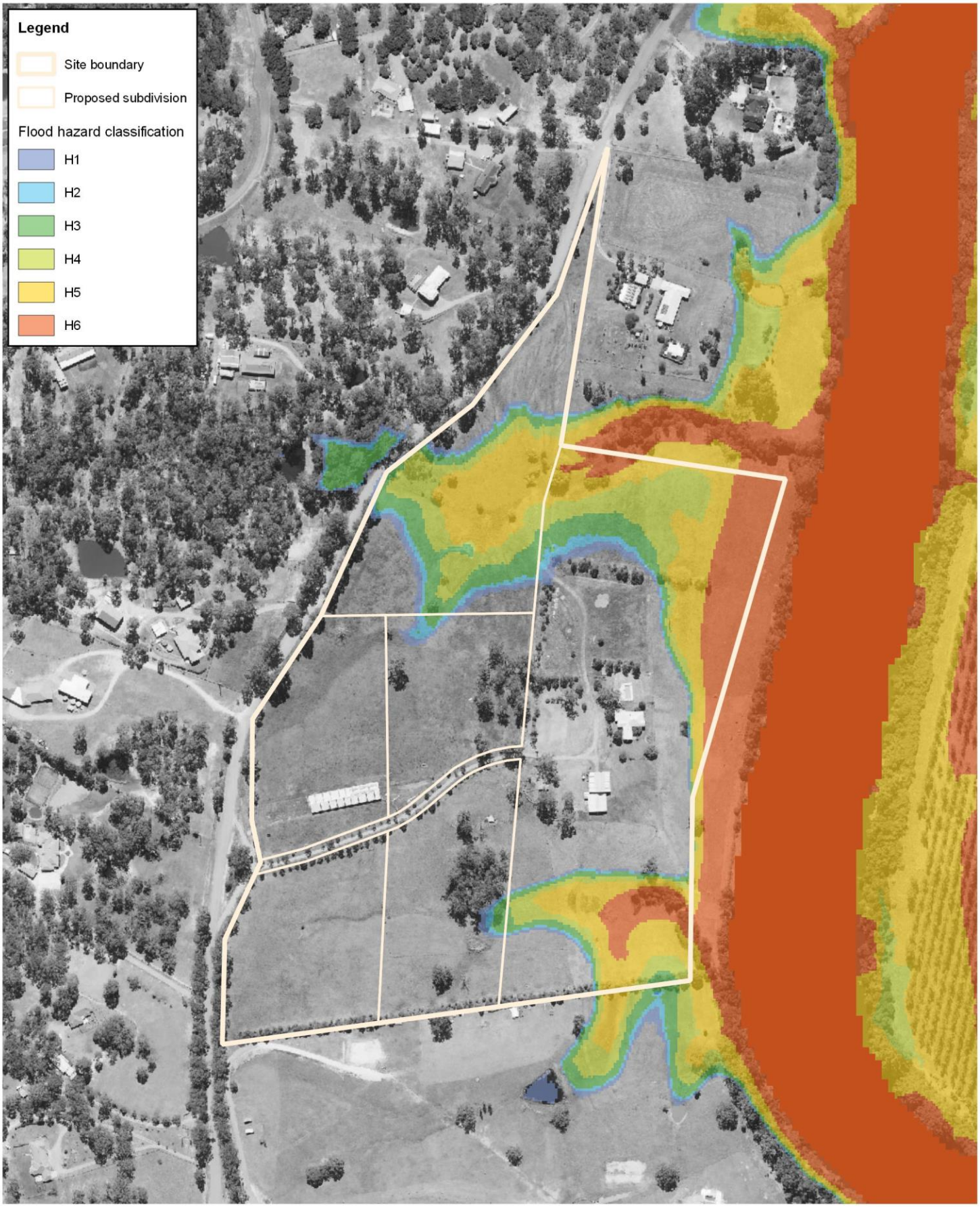

Title:

Williams River 5% AEP Flood Hazard

0 100 200 m

approx. scale

Figure: 7

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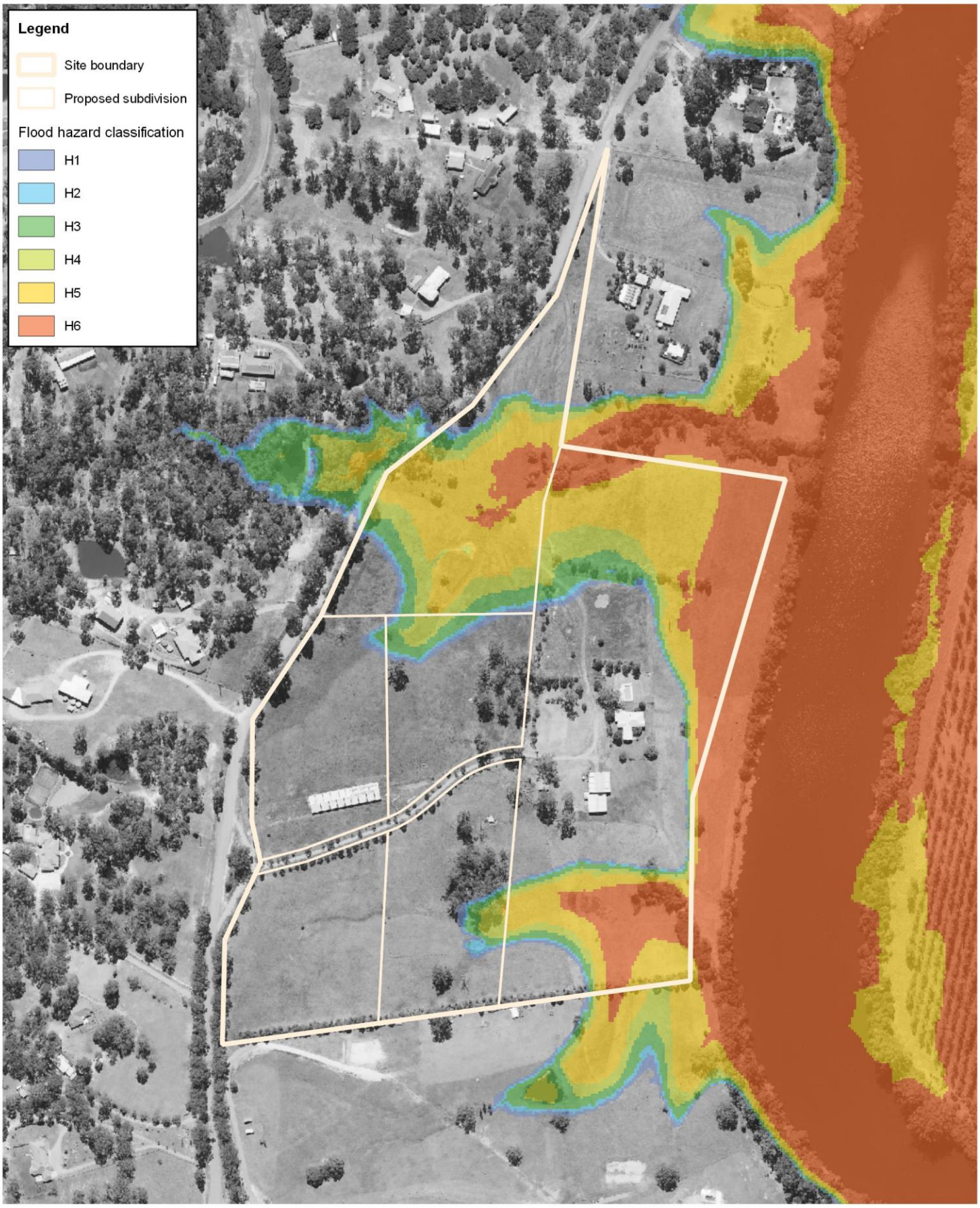

Title:

Williams River 1% AEP Flood Hazard

0 100 200 m

approx. scale

Figure: 8

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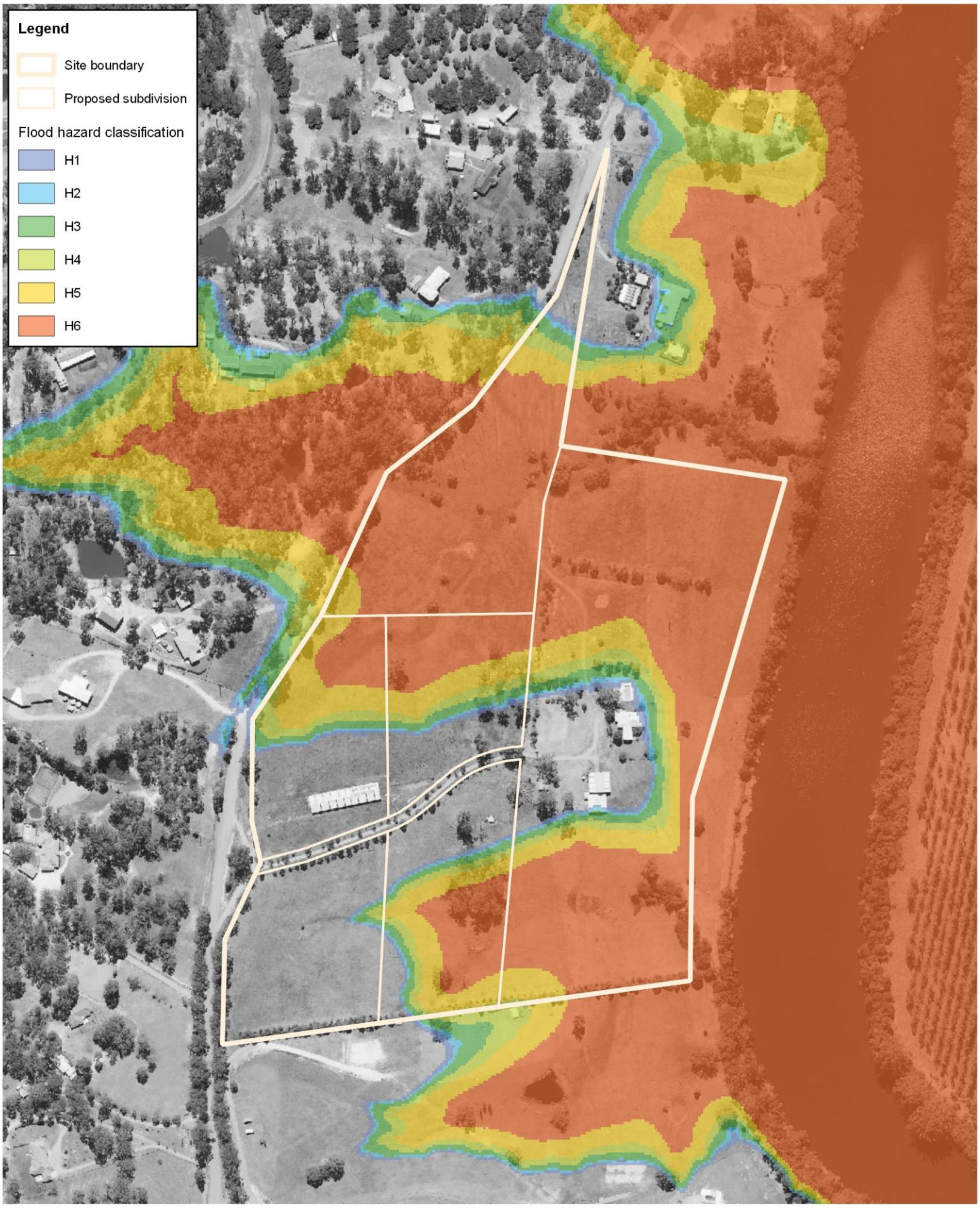

Title:

Williams River PMF Flood Hazard

0 100 200 m

approx. scale

Figure: 9

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