

THAGOONA CATCHMENT

FLOOD CONVEYANCE AND HYDRAULIC ASSESSMENT

April 2026

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IPSWICH WESTERN CORRIDOR GROWTH AREA

Thagoona Catchment – Flood Conveyance and Hydraulic Assessment

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REVISIONS

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Executive Summary

Arcadis has undertaken a hydrological and hydraulic assessment of the Thagoona sub-catchment to support the Western Corridor Growth Area Structure Plan. The purpose of this study is to understand existing flood behaviour, assess the potential impacts of future urban development, and establish a high-level floodplain conveyance and mitigation framework to inform strategic land use planning.

The assessment has been based on the existing Council-adopted flood modelling, including the Water Technology (2012) and BMT (2019) models. This approach was adopted in consultation with Ipswich City Council to ensure consistency with the current regional flood modelling framework and to allow direct comparison with existing flood mapping and planning controls. While Council is currently progressing updates to its regional models, including the adoption of ARR2019 rainfall, this study reflects the current endorsed modelling basis.

Under existing conditions, flooding within the Thagoona catchment is primarily driven by breakout flows from O'Shea Gully and constrained conveyance at the railway corridor. These constraints result in significant upstream ponding and elevated flood hazard across parts of the township.

The post-development (unmitigated) scenario indicates that increased imperviousness associated with urbanisation results in moderate increases in flood levels, generally up to 50 mm and locally up to 100 mm. These increases are primarily attributed to higher runoff volumes and changes in flow timing.

A mitigated development scenario was developed in collaboration with Council, incorporating a combination of bunding and targeted conveyance improvements aligned with the proposed Environmental Management Corridors. The results demonstrate that these measures significantly improve overall flood behaviour by containing flows within defined corridors and reducing the extent and severity of inundation across developable areas.

While some localised increases in flood levels remain, particularly in areas downstream of key constraints, these are generally minor and are offset by broader reductions in flood extent and hazard across the catchment. The railway corridor remains a key hydraulic control on flood behaviour, and ultimate flood performance is influenced by the capacity of existing crossings.

This assessment has been undertaken at a strategic planning level to support the Structure Plan. The proposed mitigation measures represent a conceptual floodplain management framework and will require further refinement and detailed design as part of future planning and development stages.

Overall, the study demonstrates that flood risk within the Thagoona sub-catchment can be effectively managed through a coordinated conveyance and mitigation strategy, providing a sound basis to support future urban development within the Structure Plan area.

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1 Introduction

The Thagoona sub-catchment is planned to accommodate future growth through the development and implementation of a structure plan that maintains the functionality and resilience of the regional floodplain. The draft concept structure plan defines a framework of residential and community land uses with a strong emphasis on the preservation of natural floodplain corridors through designated Environmental and Recreation areas.

To support this vision, Arcadis has been engaged to undertake targeted hydrological and hydraulic modelling to establish and validate a sub-regional floodplain conveyance system for the Thagoona area. The proposed works aim to build a robust technical foundation for future planning and the formulation of effective flood mitigation strategies.

This assessment reviews existing regional flood models, updates the hydrological and hydraulic models to reflect the proposed structure plan, and evaluates the potential impacts of urbanisation on flood behaviour. The outcomes will guide the development of a comprehensive flood mitigation strategy, formulated in collaboration with Council, to ensure that proposed development achieves flood immunity objectives, minimises risk to existing communities and infrastructure, and supports sustainable land-use planning across the Thagoona sub-catchment.

1.1 Study Area Description

Thagoona is a predominantly residential and agricultural suburb located within the Ipswich City Council (ICC) Local Government Area (LGA). It is located between the Walloon and Rosewood townships and approximately 13 km west of the Ipswich Central Business District. The region lies within the western portion of the ICC LGA and is traversed by numerous natural drainage channels that ultimately discharge into the Bremer River (Refer to Figure 1).

The Thagoona area has experienced several major flood events over recent decades, as documented in the Thagoona Flood Study & Flood Risk Management Plan (Water Technology, 2012). Notable events include those of November 2008 and January 2011, with additional flooding occurring in November 1999, May 1996, and December/January 1991–92. Historical records also indicate significant flooding in 1974, although the extent of damage at that time was limited due to the relatively low level of urban development.

The November 2008 flood event was the most severe since 1974 and resulted in extensive damage across the area. Widespread overland flow inundated residential and agricultural properties, causing damage to houses, sheds, vehicles, and road infrastructure. Flooding in Thagoona primarily results from breakout flows from local creeks, compounded by a sub-optimal stormwater drainage network that restricts effective conveyance during major rainfall events.

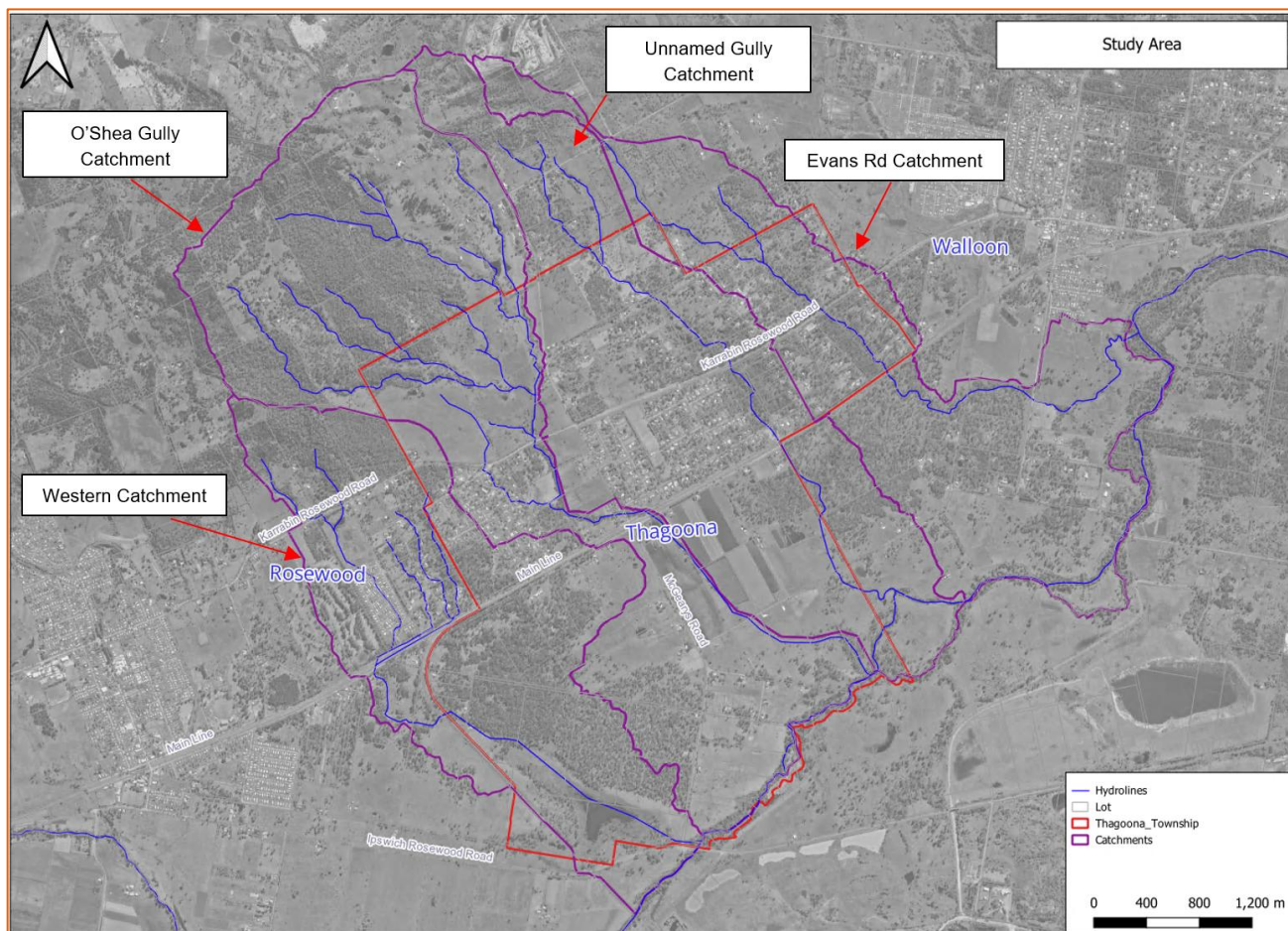


Figure 1 Study Area

1.1 Methodology

The methodology adopted for this assessment involved a review of available data and the update and application of existing hydrologic and hydraulic models to evaluate the potential impacts of the proposed Thagoona Structure Plan and to inform a high-level flood mitigation strategy.

Existing Flood Model (Base Case):

The hydrological and hydraulic models originally developed by Water Technology (2012) and subsequently updated by BMT (2019) were adopted as the basis for this assessment, consistent with the current Council-endorsed modelling framework.

A review of the provided models was undertaken, including test simulations to confirm that the model reproduced the supplied outputs. No additional calibration or validation was undertaken as part of this assessment, as this was outside the scope of works.

The verified model outputs were adopted as the existing (baseline) condition for subsequent comparative assessments.

Hydrological Model Update:

The WBNM hydrological model was updated to reflect the draft structure plan layout and proposed land use conditions, including revised impervious surface assumptions.

Design hydrographs for the 1% AEP and Probable Maximum Flood (PMF) events were generated and applied as inflow boundary conditions within the hydraulic model.

Flood Model Update:

The TUFLOW hydraulic model was updated to represent the proposed development scenario at a conceptual level. Updates included modification of surface roughness values, representation of indicative built form (including roads and drainage infrastructure), and refinement of overland flow corridors to align with the Environmental Management and Recreation areas identified in the draft structure plan.

The underlying model structure, boundary conditions and adopted datasets were retained to ensure consistency with the existing validated model framework.

Preliminary Flood Impact Assessment:

Model simulations were undertaken for the 1% AEP ARI and PMF events to assess changes in flood behaviour associated with the proposed development.

The assessment focused on quantifying variations in flood levels, extent and hazard, and identifying areas potentially affected by increased runoff and changes in flow distribution.

Hold Point – Collaboration with Council:

A workshop was undertaken with Ipswich City Council to review the preliminary modelling outcomes and to agree on an appropriate flood mitigation approach at a structure planning level. The adopted mitigation strategy reflects the outcomes of this consultation.

Flood Mitigation Strategy Assessment:

The agreed mitigation measures, including bunding, conveyance improvements and relevant approved development applications (DAs), were incorporated into the hydraulic model.

Simulations were undertaken to assess the performance of the proposed mitigation measures and to confirm their effectiveness in improving flood behaviour and managing flood risk across the catchment.

Reporting:

The outcomes of the assessment are presented in this report, including comparisons between existing, unmitigated and mitigated development scenarios. Key outputs include flood depth, extent and hazard mapping, as well as afflux mapping to illustrate changes in flood behaviour.

The results provide a strategic-level technical basis to support the development of a flood-resilient structure plan for the Thagoona sub-catchment.

2 Previous Studies

2.1 Thagoona Flood Study & Flood Risk Management Plan (2012) by Water Technology

In 2012, Water Technology was commissioned by Ipswich City Council to develop an comprehensive flood and water quality risk management framework for the Thagoona area. The purpose of the study was to improve understanding of existing flooding issues, establish integrated water management objectives, and support the effective management of future development within the catchment.

The study aimed to define the existing catchments and drainage characteristics, flood behaviour, and constraints across the study area, as well as to identify the direction, extent, and hazard associated with overland flow paths in urbanised areas. It also sought to develop integrated water management objectives and design parameters to guide sustainable development outcomes.

As part of the study, a WBNM hydrological model and a TUFLOW hydraulic model were developed to represent and assess flooding behaviour across the study area.

The study concluded with the preparation of a conceptual flood risk management strategy outlining preferred structural and non-structural measures, implementation priorities, and cost considerations for Council's future planning and decision-making.

Several mitigation options have been proposed and tested in the 2012 Study. Among them, some of the preferred options which have also been considered in the current assessment are summarised below:

1. O'Shea Gully Bund:

This option involves constructing a bund adjacent to O'Shea Gully to prevent the large volume of water that overflows from the gully and enters the residential area to the east.

This measure is expected to provide significant flood reduction benefits to the residential areas between Thagoona Haigslea Road and the unnamed gully.

2. Railway Swale Upgrade:

This option proposes upgrading the swale to the north of the railway to improve its capacity to divert and convey more flow into the unnamed gully.

The upgraded swale would enhance water conveyance towards the bridge, reduce inundation along the railway, and lower flood depths for properties along Adelong Avenue.

2.2 Thagoona Flood Study Addendum (2019) by BMT

The Thagoona Flood Study Addendum (BMT, 2019) was undertaken to update and refine the flood modelling for the Thagoona catchments in support of the Ipswich Rivers Flood Study Update (IRFSU) project. The IRFSU focused on the development of updated hydrologic and hydraulic models for the Bremer River catchment, with particular emphasis on the main watercourses of the Bremer River, Warrill Creek, and Purga Creek systems.

As part of this broader initiative, Ipswich City Council (ICC) requested that the existing local creek models for the Thagoona region be updated to ensure consistency with both the new Bremer River catchment model and the results of the Brisbane River Catchment Flood Study (BRCFS) completed by BMT WBM in 2017. The updated models aimed to improve flood behaviour representation within the Thagoona sub-catchments and to align local flood assessments with regional model frameworks.

The objectives of the local creek model update were to:

- Update downstream boundary conditions (tailwater levels) to be consistent with the IRFSU and BRCFS modelled river levels;
- Ensure that all required Annual Exceedance Probability (AEP) events were simulated; and
- Derive classified hydraulic hazard outputs in accordance with the Australian Disaster Resilience Guideline Managing the Floodplain (Handbook 7) to define potential hydraulic risk.

This addendum provided the technical foundation for improved flood mapping and risk assessment within the Thagoona region, supporting Ipswich City Council's ongoing program of flood model standardisation and catchment-wide resilience planning.

3 Structural Plan

The Western Corridor Growth Area Draft Structure Plan, prepared by URBIS, was received in August 2025, as shown in Figure 2. The plan outlines the future urban development vision for the western precincts of Ipswich, encompassing the Rosewood, Thagoona, and Walloon townships.

The structure plan provides a coordinated framework to guide residential growth, community infrastructure, environmental management, and open space planning across the corridor, aligning with Ipswich City Council's long-term strategic objectives for sustainable urban expansion.

The plan introduces a hierarchy of residential zones ranging from character residential and low-density suburban precincts to medium-density residential areas. Significant emphasis is placed on environmental management and floodplain preservation, with broad green corridors and environmental management zones established along key waterways and drainage lines.

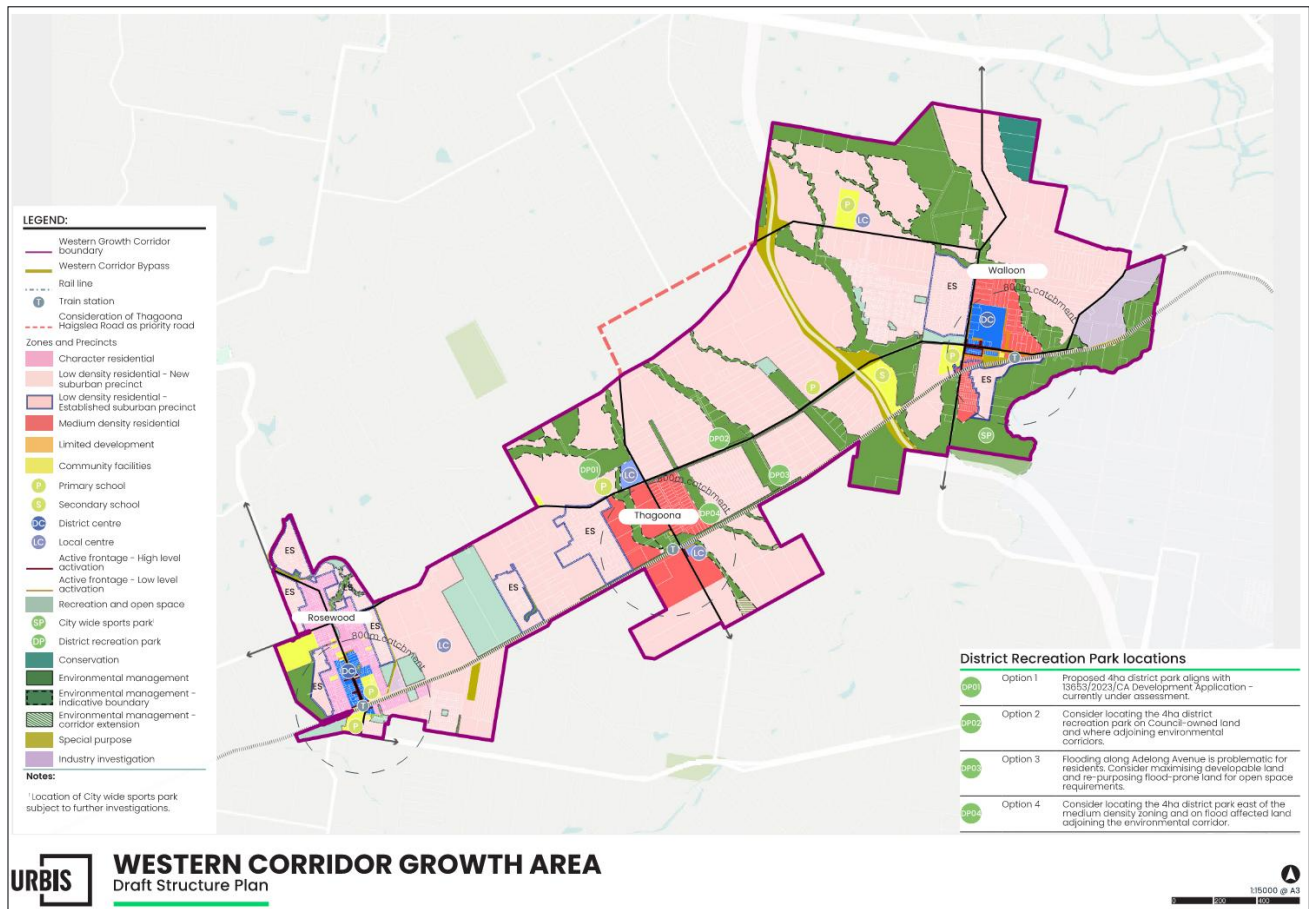


Figure 2 Draft Structural Plan (August 2025)

4 Hydrological Modelling

The hydrological model adopted for the existing case is the WBNM model developed as part of the Water Technology (2012) study. The model has been calibrated against the historical flood events of 2008 and 2011. Design rainfalls have been derived in accordance with ARR (1987), while the Probable Maximum Flood (PMF) event has been estimated using the Bureau of Meteorology Bulletin 53, Generalised Short Duration Method (GSDM). No updates to the WBNM model have been undertaken during the BMT (2019) study, and the model has been considered sufficient for use without modification.

A total of 137 sub-catchments, covering an area of approximately 2,785 ha, have been delineated, as shown in Figure 3. Output hydrographs generated from the WBNM model have been incorporated into the provided TUFLOW model.



Figure 3 Subcatchments Delineation

During the Water Technology (2012) study, the impervious fraction for each sub-catchment has been estimated using aerial photography provided by Ipswich City Council (ICC), by identifying areas occupied by buildings, roads, and other impervious surfaces. The adopted impervious percentages for different land uses are summarised in Table 1.

Table 1 Adopted Imperviousness

Land Use	Percent Impervious (%)
Creeks, Vegetation	0
Roads	100
Buildings	100
Fenced Yards	10
Low Density Residential	50
Medium Density Residential	60
Mixed Residential Density	60
District Centre	90
Schools And Special Use	65
Environment Management	00
Recreation and Open Space	10
Community Facilities	60
Limited Development	60

As a result of the newly proposed draft structural plan, residential densities are expected to increase, leading to larger impervious areas and consequently higher runoff from these catchments. Accordingly, for the developed scenario, the impervious fractions were revised based on the proposed structure plan (August 2025). To calculate the impervious fractions, the catchment boundaries were overlaid with the structural plan, and the same imperviousness values for each land use were adopted in the post-development scenario to maintain consistency with the previous modelling. Outside the designated development zones, the existing impervious values were retained.

5 Hydraulic Modelling

The hydraulic model adopted for this assessment is the TUFLOW model originally developed by Water Technology (2012) and subsequently updated by BMT (2019). The model has been previously calibrated and validated against the November 2008 and January 2011 flood events and is consistent with the current Council-endorsed regional modelling framework.

The provided model was reviewed prior to use, and minor issues were identified and discussed with Ipswich City Council. These were resolved through the adoption of the same TUFLOW version used in the 2019 update. Accordingly, it was agreed to retain the existing model configuration, including rainfall inputs and temporal patterns, to ensure consistency with Council's current modelling framework.

The base model structure, boundary conditions and input datasets have been retained. Targeted modifications were undertaken to represent the proposed development scenario at a conceptual level, including updates to surface roughness and the representation of indicative land use and flow corridors.

The model utilises a 2009 LiDAR dataset to define topography, which has been retained for consistency with the adopted model. A 3 m grid resolution has been applied, consistent with previous studies. Simulations were undertaken using TUFLOW version 2018-03-AC with the HPC solver.

The model domain covers the floodplain area north of the railway line (refer to Figure 4). Boundary conditions are located sufficiently upstream and downstream of the area of interest to avoid influencing model results.

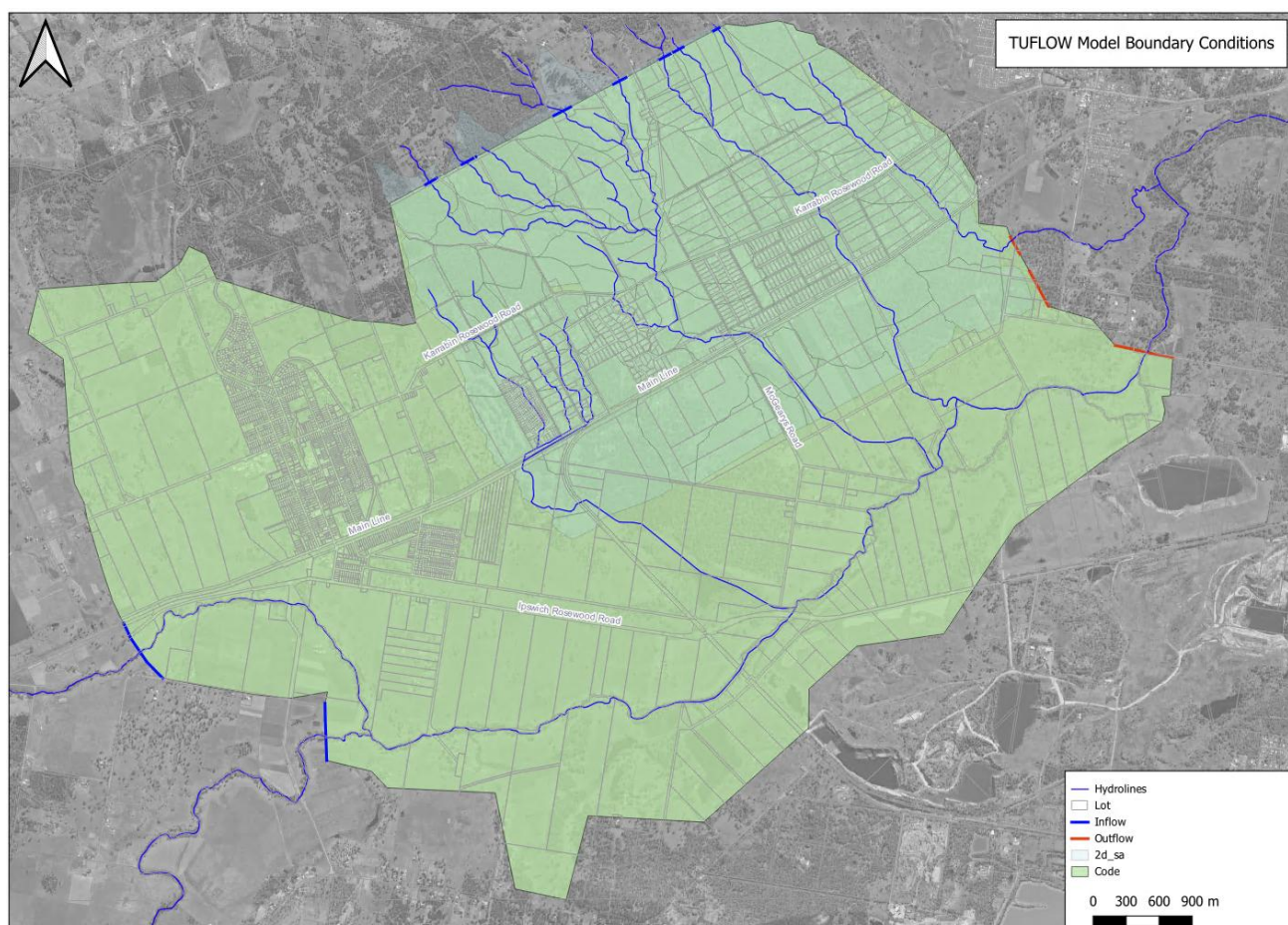


Figure 4 TUFLOW Model Extent and Boundary Conditions

WBNM hydrographs were applied within the TUFLOW model as both external inflow boundaries and internal local-catchment inflows. External upstream boundary conditions were applied at Western Creek and the Bremer River. A 1 in 20 AEP regional inflow has been adopted for all local events greater than the 1 in 20 AEP event, consistent with the adopted regional modelling approach.

For Western Creek, inflows were extracted at the Rosewood Wastewater Treatment Plant, with a peak 1 in 20 AEP flow of 560 m³/s. For the Bremer River, inflows were extracted at Spressers Bridge, with a peak 1 in 20 AEP flow of 850 m³/s. These inflows were applied as steady-state boundary conditions. The downstream boundary condition was applied at Five Mile Bridge on the Bremer River and defined using a normal depth condition with an assumed bed slope of 0.005.

The Manning's roughness (n) values adopted in the model are summarised in Table 2.

Table 2 Roughness Values

ID	Manning's n	Description
1	0.055	Open/Cleared Pasture
2	0.020	Roads
3	0.080	Vegetation & Riparian Zones
4	0.080	Ephemeral Creeks
5	0.025	Waterbodies – Rivers & Dams
6	0.200	Buildings/Built-Up Environments
7	0.030	Maintained Grass
8	0.080	Fenced Yards, railway embankment
9	0.150	Heavy/Native Vegetation
10	0.030	Proposed Allotments
11	0.060	Fenced yards in Thagoona town
12	0.035	Dirt road Kavanagh Rd East
21	0.055	Default
22	0.020	Roads
23	0.035	Rivers and Creeks
24	0.015	Town Drain
25	0.060	Stability Issues
26	0.200	Houses
302	0.030	Non-Tidal Waterway
304	0.045	River Bank Vegetation – Low Density/Maintained
305	0.065	River Bank Vegetation – Medium Density
306	0.090	River Bank Vegetation – High Density
310	0.040	Grassland (Long)
311	0.040	Light Vegetation
312	0.100	Dense Vegetation
314	0.150	Very Dense Vegetation
315	0.060	Rough Pasture/Light Brush
401	0.150	Medium Density Residential
402	0.100	Low Density Residential
403	0.080	Environmental Corridors

Consistent with the 2012 study, Manning's roughness values outside the Environmental Management Corridors were not modified for the developed scenario. This reflects the absence of detailed earthworks and final development layouts at this stage of planning. In practice, future development will be required to demonstrate compliance with no worsening (or nil impact) criteria both upstream and downstream.

Accordingly, the developed case results presented in this assessment primarily reflect changes in runoff associated with increased imperviousness, rather than detailed representation of final surface conditions. Roughness values within the Environmental Management Corridors were refined to represent the proposed land use intent. Refer to Figure 5 and Figure 6.



Figure 5 Roughness Values (Pre-Development scenario)



Figure 6 Roughness Values (Post-Development scenario)

The critical storm duration adopted for this assessment is consistent with the findings of the Water Technology (2012) study. The original assessment tested a range of durations (25, 60, 90, 120, 180 and 360 minutes), with the 60-minute duration identified as critical across the majority of the catchment. This duration has therefore been adopted for the current assessment.

6 Modelling Results

6.1 Existing Condition

6.1.1 1% AEP Event

Figure 7 illustrates the 1% AEP ARI peak flood depths across the study area. Flood depths are presented using colour gradations ranging from white (<0.01 m) to purple (>3.6 m).

Flooding within the Thagoona catchment is primarily driven by breakout flows from O'Shea Gully, located to the west of the township. These breakout flows occur both north and south of Karrabin Rosewood Road and propagate eastward across Thagoona Haigslea Road, affecting properties between Thagoona Haigslea Road and Carara Avenue. Flow depths in these areas are generally up to approximately 0.6 m.

Flows continue south towards Adelong Avenue before entering the railway swale system. The railway corridor represents a key hydraulic control within the catchment, restricting flow conveyance to a limited number of openings.

Properties located north of the railway and south of Adelong Avenue are particularly susceptible to flooding due to this constraint. Undersized crossings, particularly at the unnamed gully, result in backwater effects and significant upstream ponding, with depths reaching up to approximately 1.6 m in some locations.

The corresponding flood hazard distribution for the 1% AEP event is presented in Figure 8. Areas subject to deeper and faster-flowing water exhibit higher hazard classifications, with hazard levels reaching up to H5 in locations affected by significant ponding and concentrated flow paths.

Overall, flood behaviour under the 1% AEP event is characterised by:

- Breakout flows from O'Shea Gully;
- Eastward overland flow across developed areas; and
- Significant ponding upstream of the railway due to limited conveyance capacity.

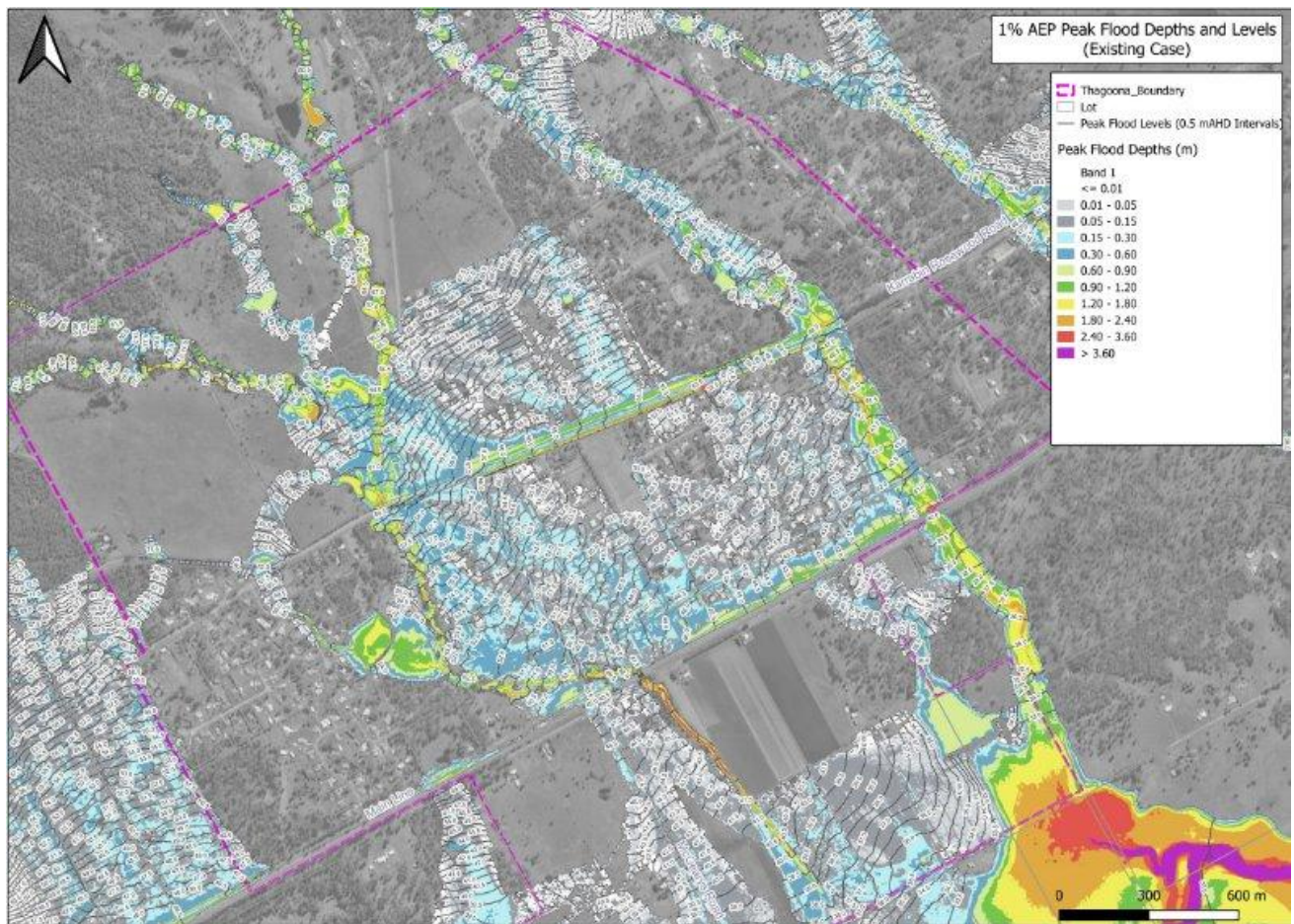


Figure 7 Existing Condition – 1% AEP Peak Flood Depth (m)

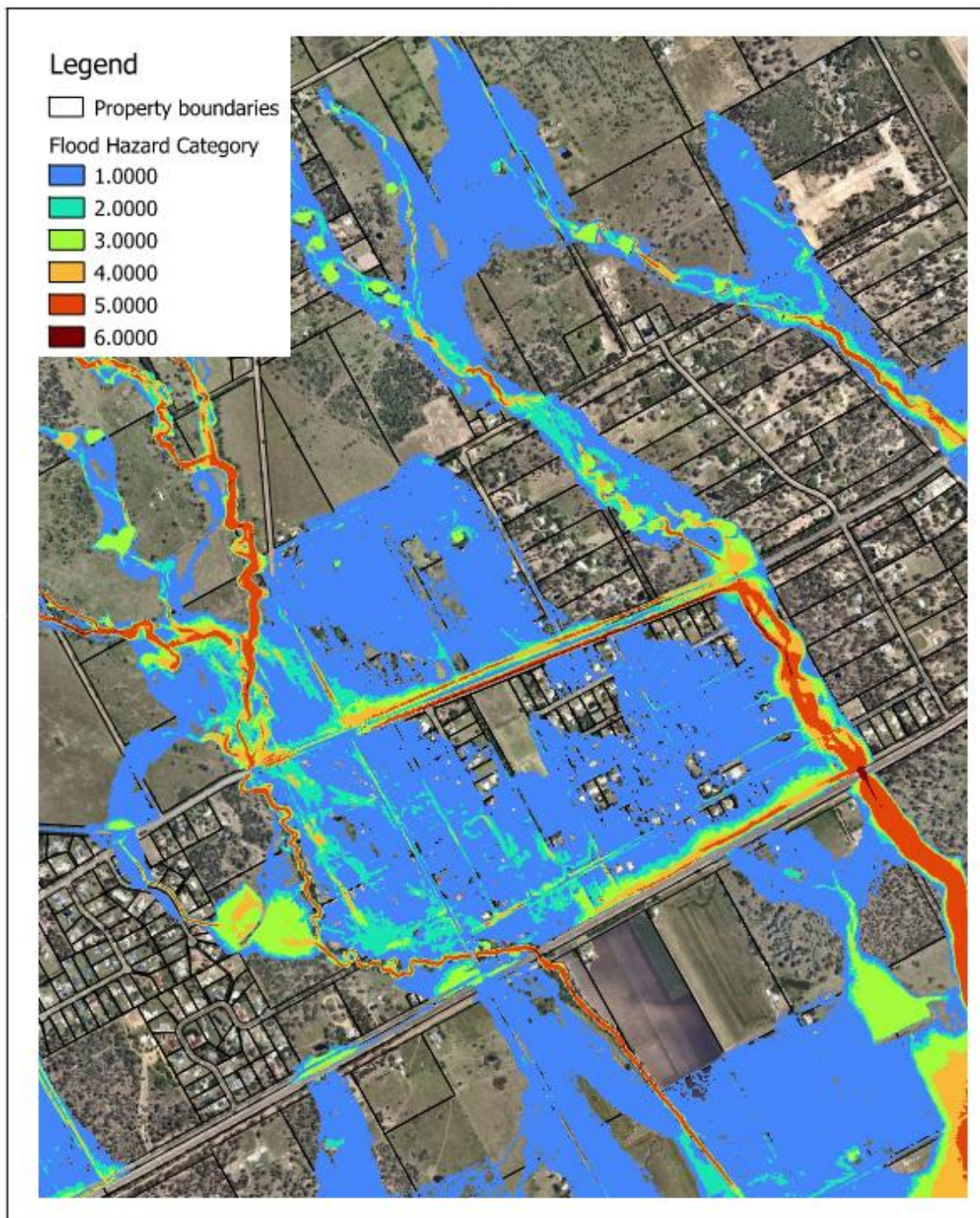


Figure 8 Existing Condition – 1% AEP Flood Hazard Map

6.1.2 PMF Event

Figure 9 illustrates the existing PMF peak flood depths across the study area. Flood depths are presented using colour gradations ranging from white (<0.01 m) to purple (>3.6 m).

The PMF event represents a more extreme manifestation of the flood behaviour observed under the 1% AEP event, with widespread inundation across the Thagoona catchment. Flooding is primarily driven by breakout flows from O'Shea Gully, occurring both north and south of Karrabin Rosewood Road. Flow depths in these areas generally range between 0.6 m and 1.8 m, with isolated locations exceeding 2.4 m.

As with the 1% AEP event, flows propagate eastward across the township before being conveyed towards the railway corridor. The railway continues to act as a key hydraulic control, restricting downstream conveyance and resulting in significant upstream ponding.

Properties located north of the railway and south of Adelong Avenue experience extensive inundation under PMF conditions, with depths reaching up to approximately 1.6 m. These conditions reflect the combined influence of regional inflows and constrained conveyance through existing railway crossings.

Overall, the PMF event highlights the dominant influence of O'Shea Gully breakout flows and the railway constraint on flood behaviour within the catchment, resulting in widespread inundation and elevated water levels across the study area.

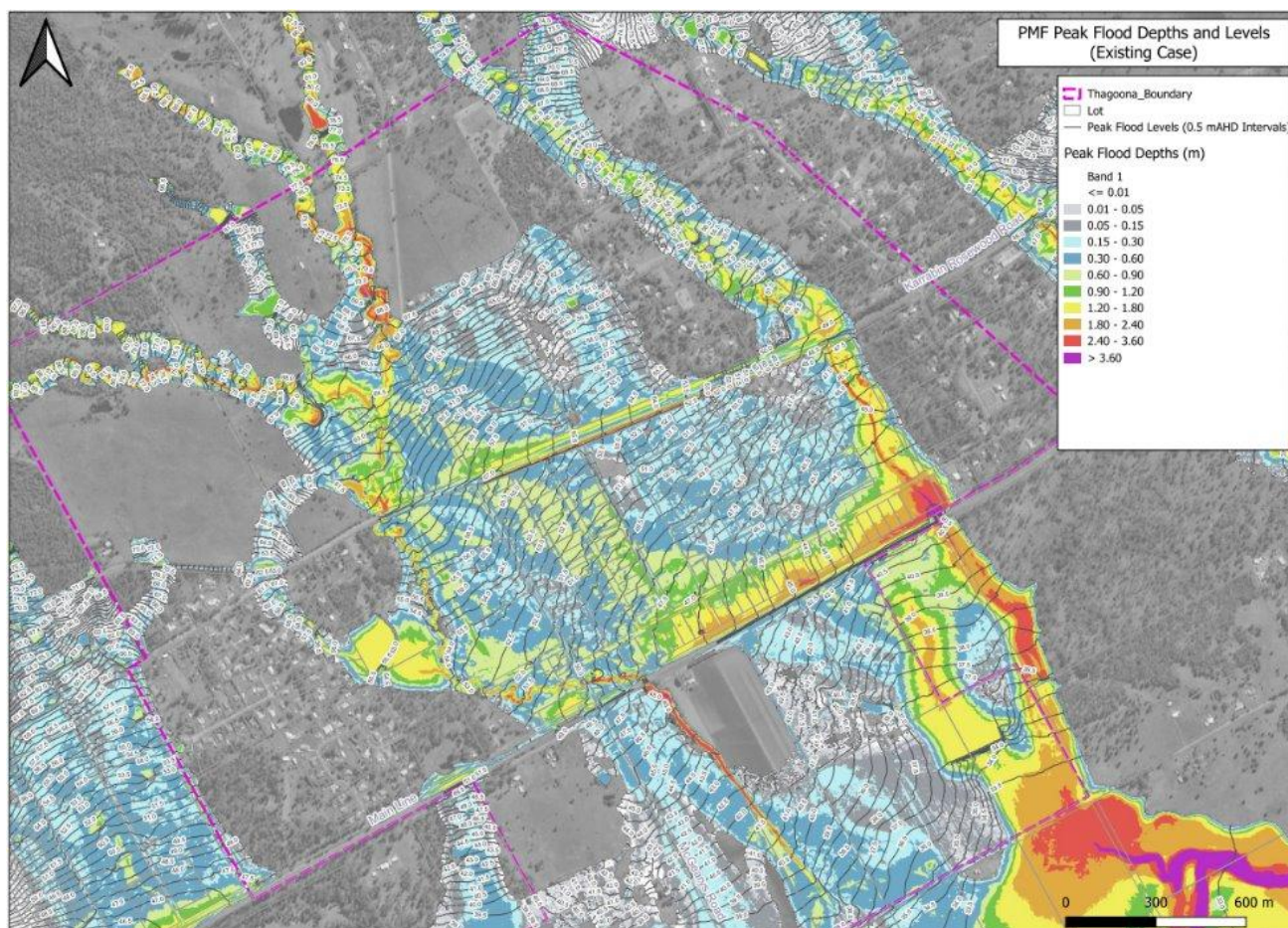


Figure 9 Existing Condition – PMF Flood Depth (m)

6.2 Post-Development Condition

6.2.1 The Unmitigated Scenario

The unmitigated scenario represents the post-development condition without the inclusion of any flood mitigation measures. As described in Section 4, the WBNM model was updated to reflect the draft structure plan and revised impervious surface assumptions. The resulting hydrographs were applied to the TUFLOW model to simulate the post-development condition.

Surface roughness values were modified only within the Environmental Management Corridors to reflect the proposed land use intent, with the remainder of the model consistent with the existing condition.

Figures 10 and 11 present the change in peak flood levels (afflux) for the 1% AEP and PMF events, respectively. In these figures, warm colours (yellow to orange) indicate increases in flood levels, while cool colours (light to dark blue) indicate reductions.

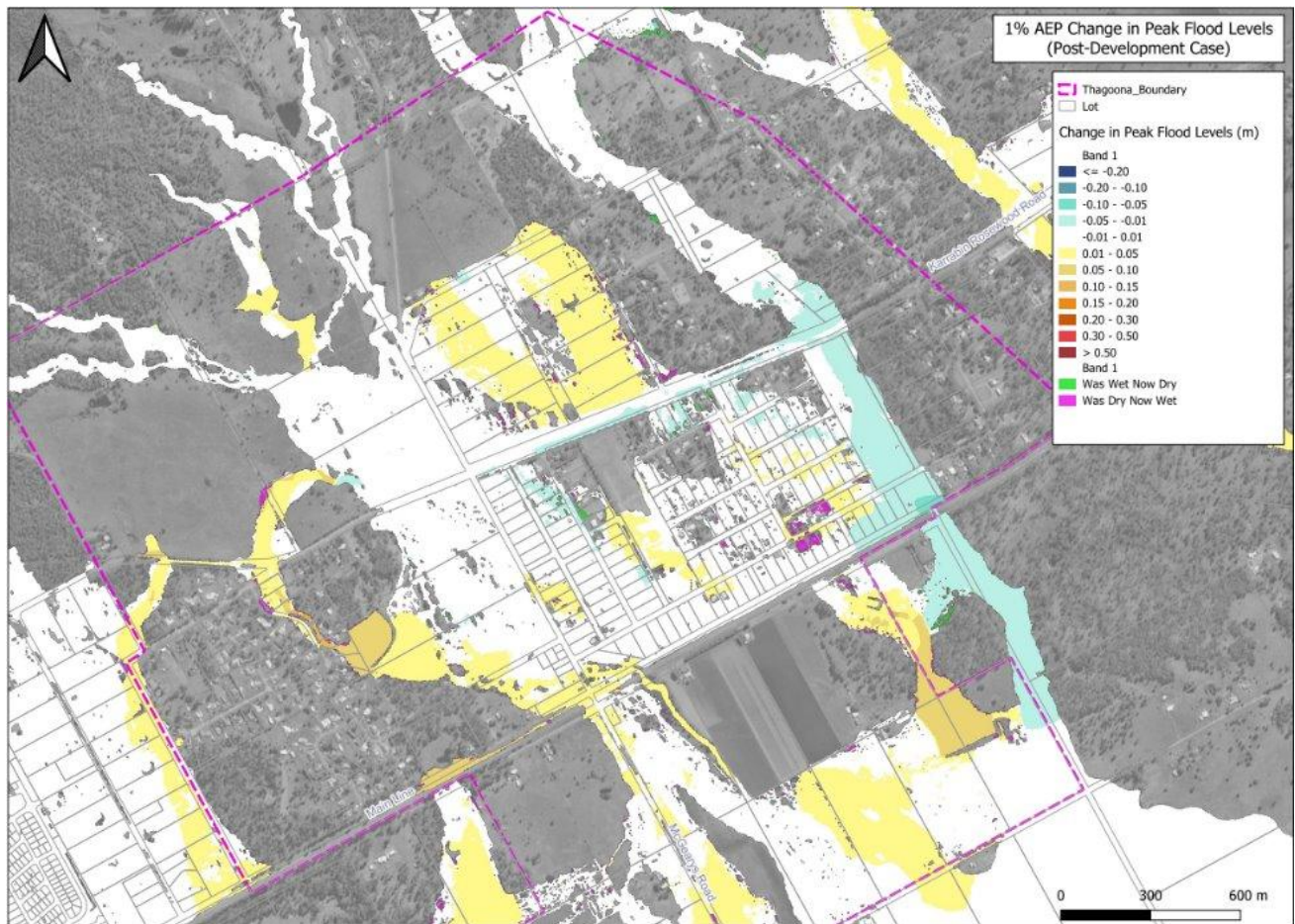
The results indicate that increased imperviousness associated with urban development results in moderate increases in flood levels across the study area. Increases are generally up to 50 mm, with some localised increases of up to 100 mm.

These increases are primarily driven by:

- Increased runoff volumes due to higher imperviousness; and
- Changes in flow timing across the catchment.

Localised reductions in flood levels are observed in parts of the eastern catchment and are attributed to redistribution of flows and timing effects.

Overall, the unmitigated scenario demonstrates that development without mitigation results in a measurable increase in flood levels and highlights the need for a coordinated floodplain management strategy.



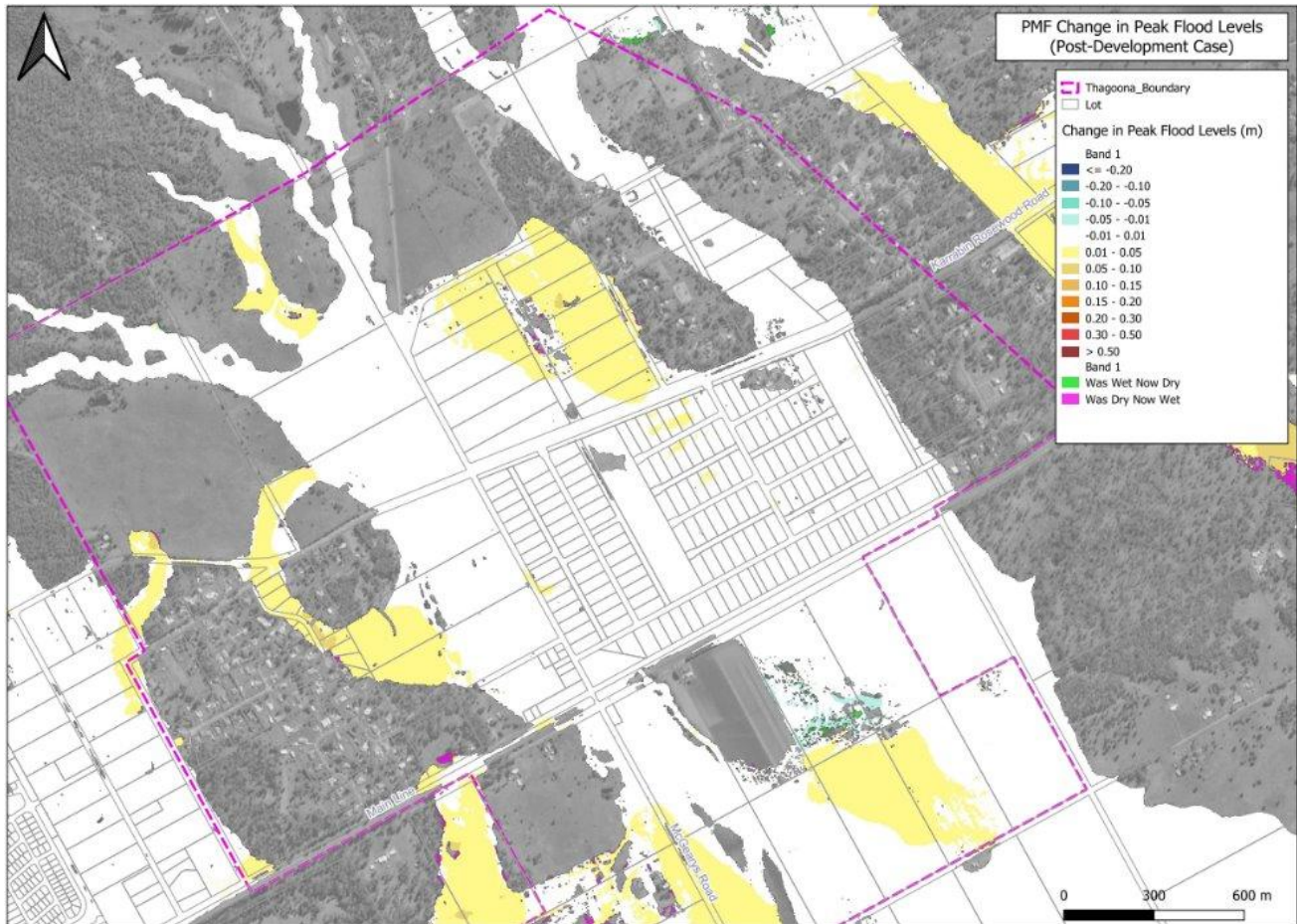


Figure 11 Post Development Unmitigated – PMF Change in Flood Level (Afflux)

6.2.2 Mitigation Strategy

A series of conceptual mitigation measures have been developed in consultation with Ipswich City Council to manage flood behaviour at a structure planning level.

The adopted measures are based on:

- The Environmental Management Corridors identified in the draft structure plan;
- Preferred options from the Thagoona Flood Risk Management Study and Plan (2012); and
- Outcomes of the workshop held with Council.

Modifications to railway crossings were not considered due to the complexity and practical constraints associated with these structures. As such, the mitigation strategy focuses on improving floodplain conveyance within the broader catchment.

The key mitigation measures include:

Bunding

A series of bunds have been incorporated, generally aligned with the Environmental Management Corridors. The bunds have been designed with crest levels set approximately 500 mm above the 1% AEP peak flood level to contain breakout flows and prevent uncontrolled inundation of developable areas.

Widening of the Northern Railway Swale

The existing swale north of the railway has been widened to improve conveyance capacity. This has been represented in TUFLOW at a conceptual level using breaklines and elevation adjustments, with an assumed width of approximately 20 m and depth of 1 m.

A bund and 900 mm diameter culvert have been introduced to facilitate controlled flow transfer from O'Shea Gully into the swale. No optimisation of culvert sizing has been undertaken at this stage.

New O'Shea Gully Bridge

A new crossing has been introduced along O'Shea Gully, as requested by Council. The existing crossing under Thagoona Haigslea Road north of the railway has been removed, with the new structure adopting similar culvert dimensions to the existing crossing.

Approved Development Applications (DA)

Approved DAs within the catchment, including Lots 12 and 13, have been incorporated at a high level. These developments include on-site detention measures and have been assumed to maintain existing runoff conditions. Detailed modelling of these systems is outside the scope of this assessment.

The mitigation strategy is intended to:

- Contain breakout flows within defined corridors;
- Improve conveyance efficiency across the floodplain; and
- Reduce flood impacts within developable areas.

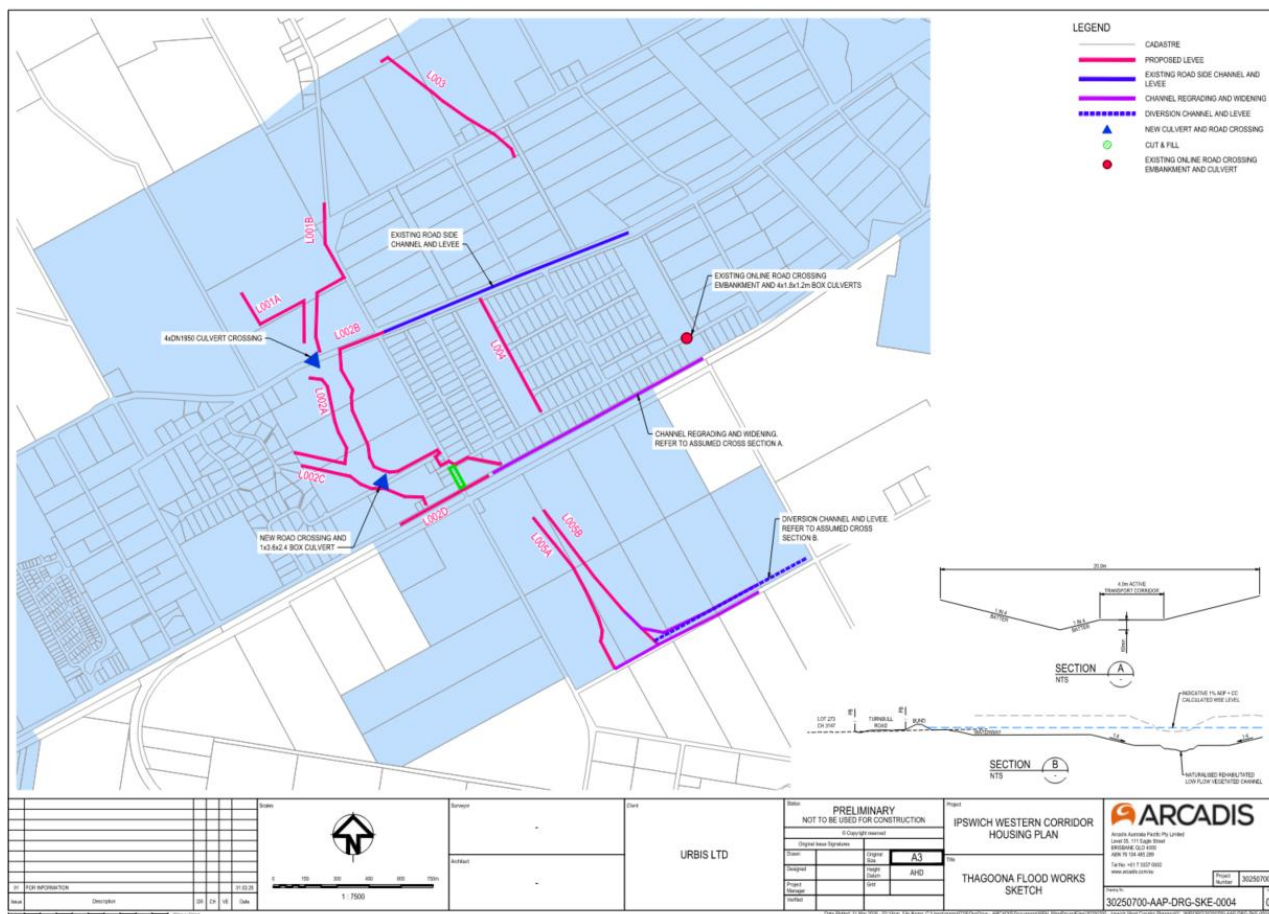


Figure 12 Mitigation Works Sketch

6.2.3 Mitigated Scenario

1% AEP Event

Figures 13 and 14 present the flood depth and change in flood levels for the mitigated 1% AEP event.

The results demonstrate that the proposed mitigation strategy significantly improves flood behaviour across the study area. Floodwaters are effectively contained within the Environmental Management Corridors, reducing lateral spread into developed areas.

Reductions in flood levels are observed across the majority of the catchment and are primarily attributed to:

- Containment of breakout flows from O'Shea Gully; and
- Improved conveyance through the widened railway swale.

Localised increases in flood levels occur adjacent to bund alignments, new flow paths and in areas north of the railway outside the designated corridors. These increases are generally minor and reflect redistribution of flows within the system.

The widening of the railway swale improves conveyance efficiency and reduces upstream ponding along the railway embankment. However, the railway corridor continues to act as a key hydraulic control on flood behaviour.

Overall, the mitigation measures result in a substantial reduction in both the extent and magnitude of flooding within developable areas.

Overall, the mitigation measures result in a substantial reduction in both the extent and magnitude of flooding across most of the developed catchment, leading to improved flood behaviour and reduced flood risk to properties within the study area.

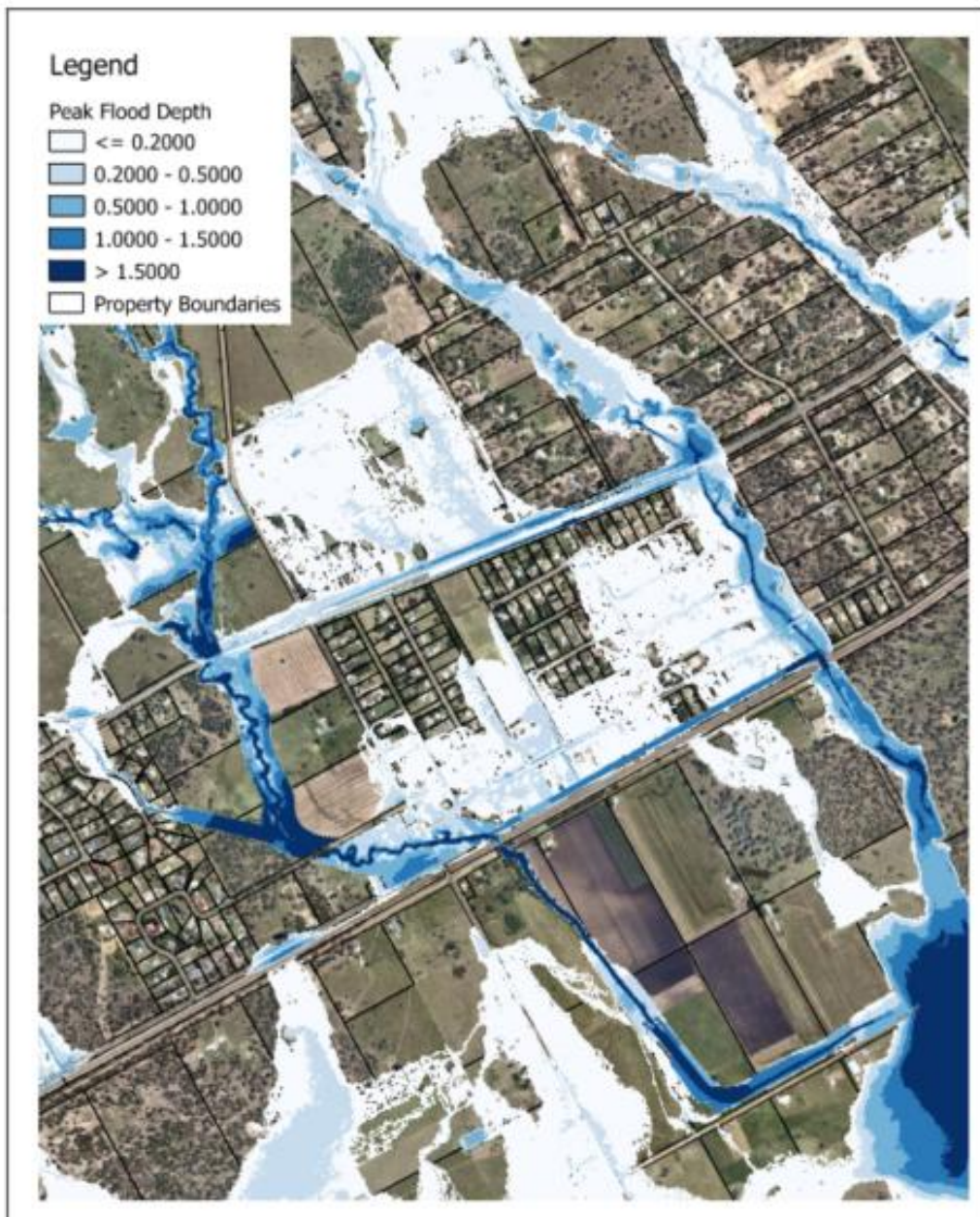


Figure 13 Post Development Mitigated 1% AEP Peak Flood Depth

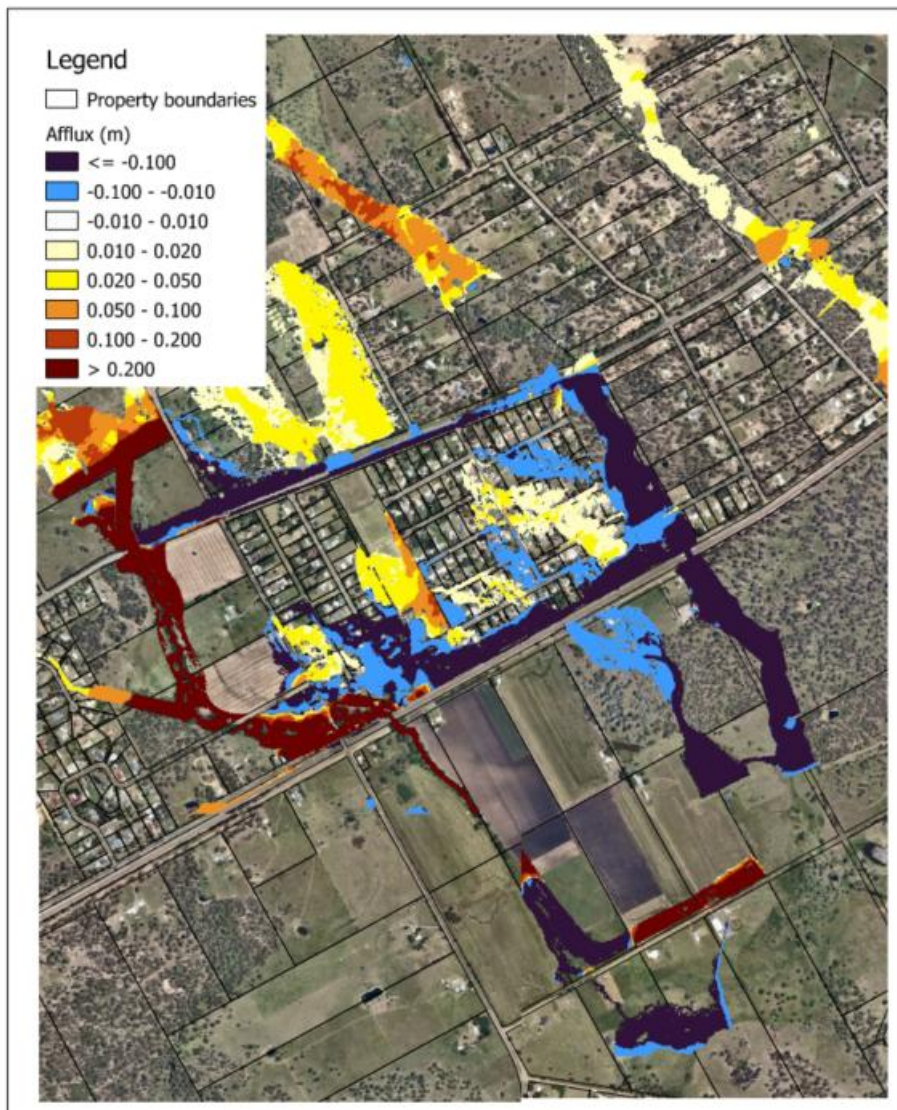


Figure 14 Post-Development Mitigated 1% AEP change in flood level (Afflux) (m)

PMF

Figures 15 and 16 present the change in peak flood levels for the mitigated PMF event.

The PMF results show similar trends to the 1% AEP event, with improved containment and conveyance of flows within the Environmental Management Corridors. Reductions in flood levels are observed upstream of the railway, where the mitigation measures are most effective.

Some localised increases in flood levels occur downstream of the railway corridor, reflecting redistribution of flows under extreme conditions. These impacts are limited in extent and are consistent with the conceptual nature of the mitigation strategy.

Overall, the mitigation strategy provides a net improvement in flood behaviour across the study area under extreme conditions.

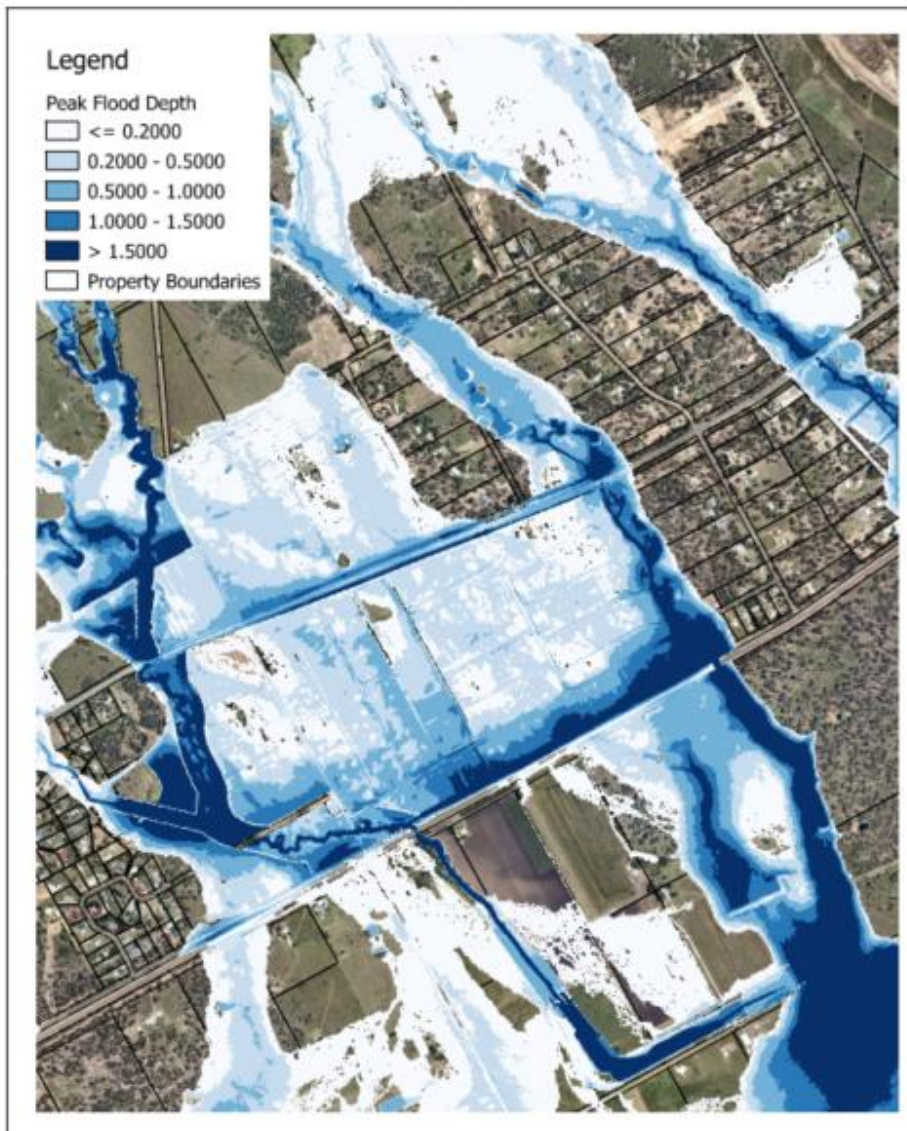


Figure 15 Post Development Mitigated PMF Peak Flood Depth

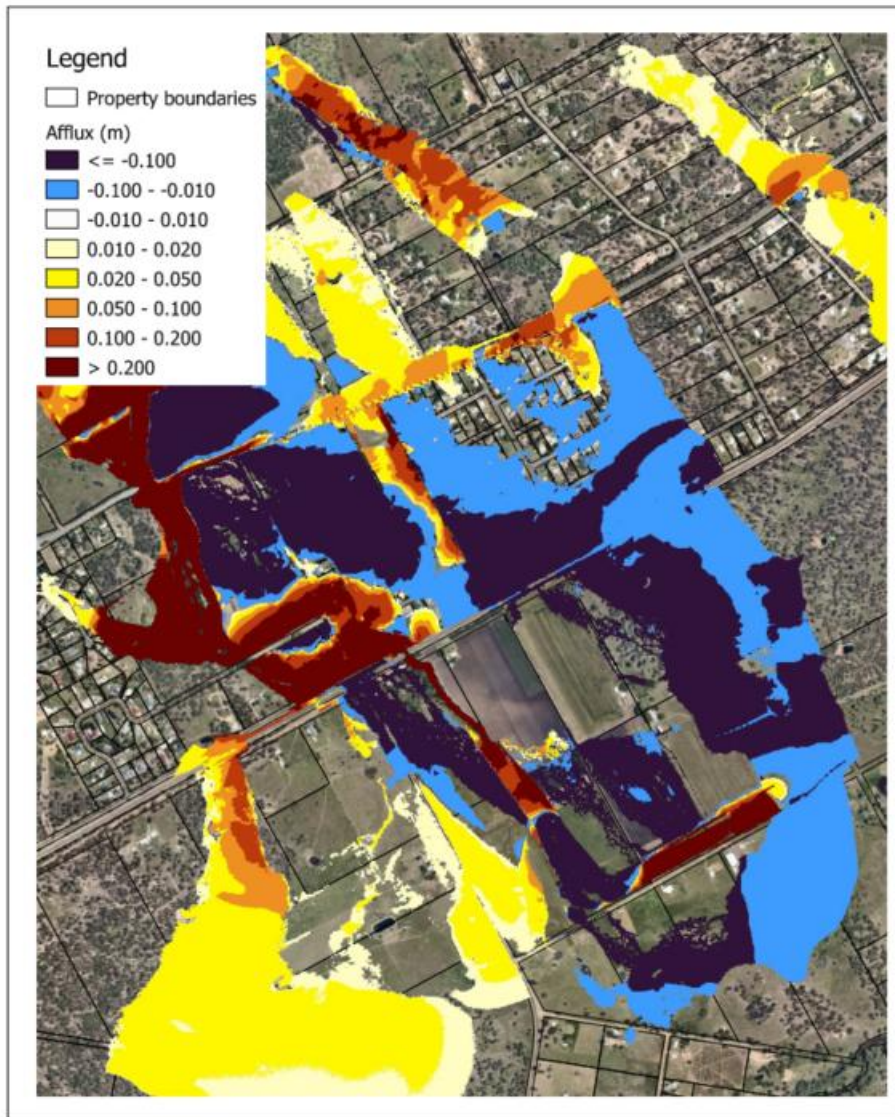


Figure 16 Post Development Mitigated - PMF Change in Flood Level (Afflux) (m)

7 Conclusions and Recommendations

The assessment confirms that increased imperviousness associated with future development results in localised increases in flood levels under unmitigated conditions.

The proposed mitigation strategy, comprising bunding and targeted conveyance improvements, has been demonstrated to be effective in reducing flood levels and limiting the extent of inundation across the majority of the study area. Floodwaters are more efficiently conveyed within defined Environmental Management Corridors, reducing impacts to surrounding and developable areas.

While some localised increases in flood levels remain, particularly downstream of the railway corridor under larger events, these are generally minor and are offset by broader reductions in flood extent and improved flood behaviour across the catchment. The railway corridor remains a key hydraulic control influencing flood behaviour.

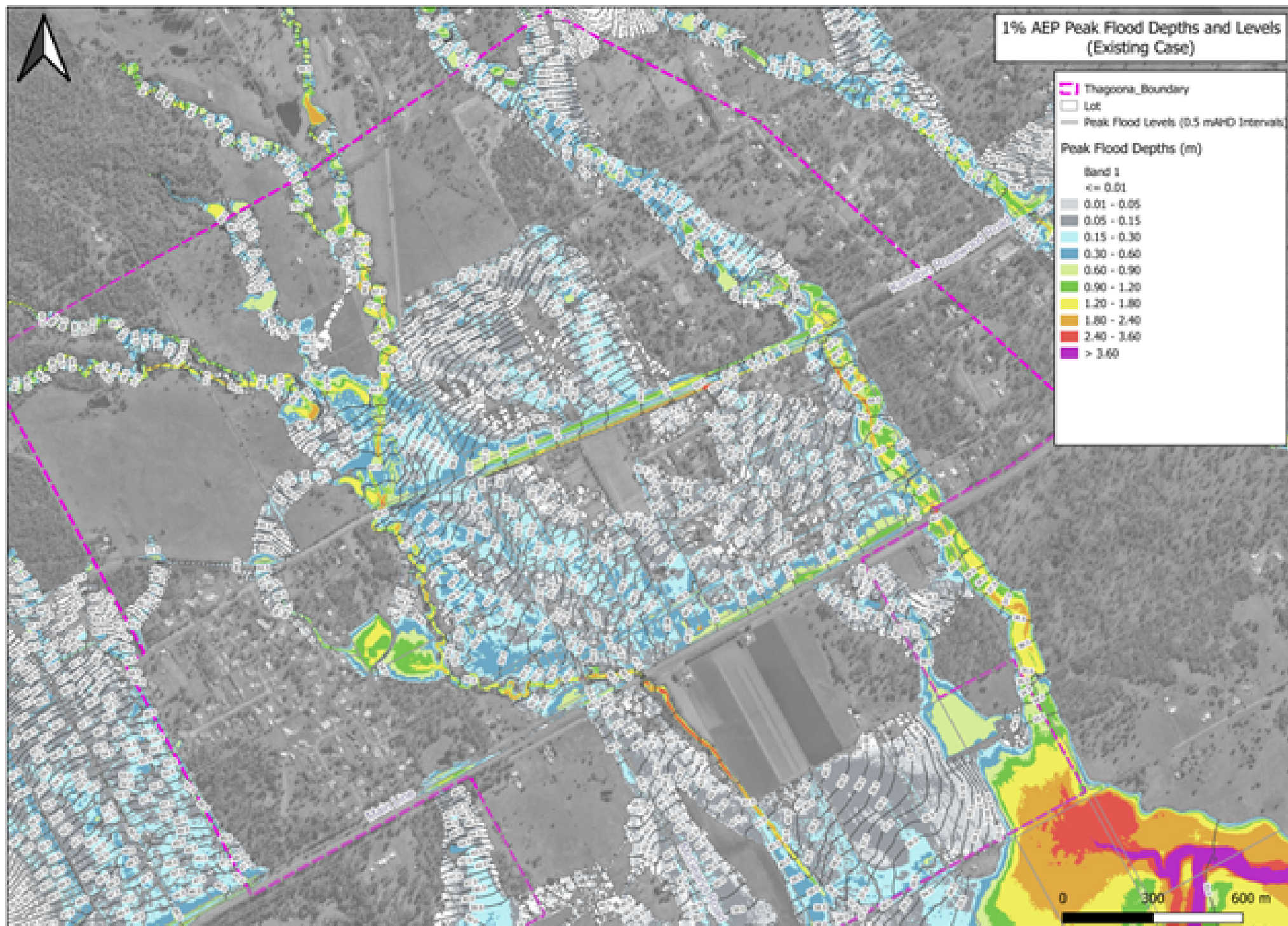
This assessment has been undertaken at a strategic, structure planning level. The proposed mitigation measures represent a conceptual floodplain management framework and will require further refinement as part of future planning and development stages.

It is recommended that:

- Detailed design and optimisation of mitigation measures be undertaken at subsequent stages;
- Further assessment of constructability, staging and integration with future development be carried out;
- Updated regional modelling, including Council's ongoing model revisions, be incorporated as it becomes available; and
- Ongoing coordination with Ipswich City Council be maintained to confirm compliance with applicable flood immunity and planning requirements.

Overall, the proposed mitigation approach provides a robust and coordinated framework for managing flood risk and supports the progression of the Thagoona Structure Plan.

APPENDIX A – FLOOD MAPS



Legend

 Property boundaries

Flood Hazard Category

 1.0000

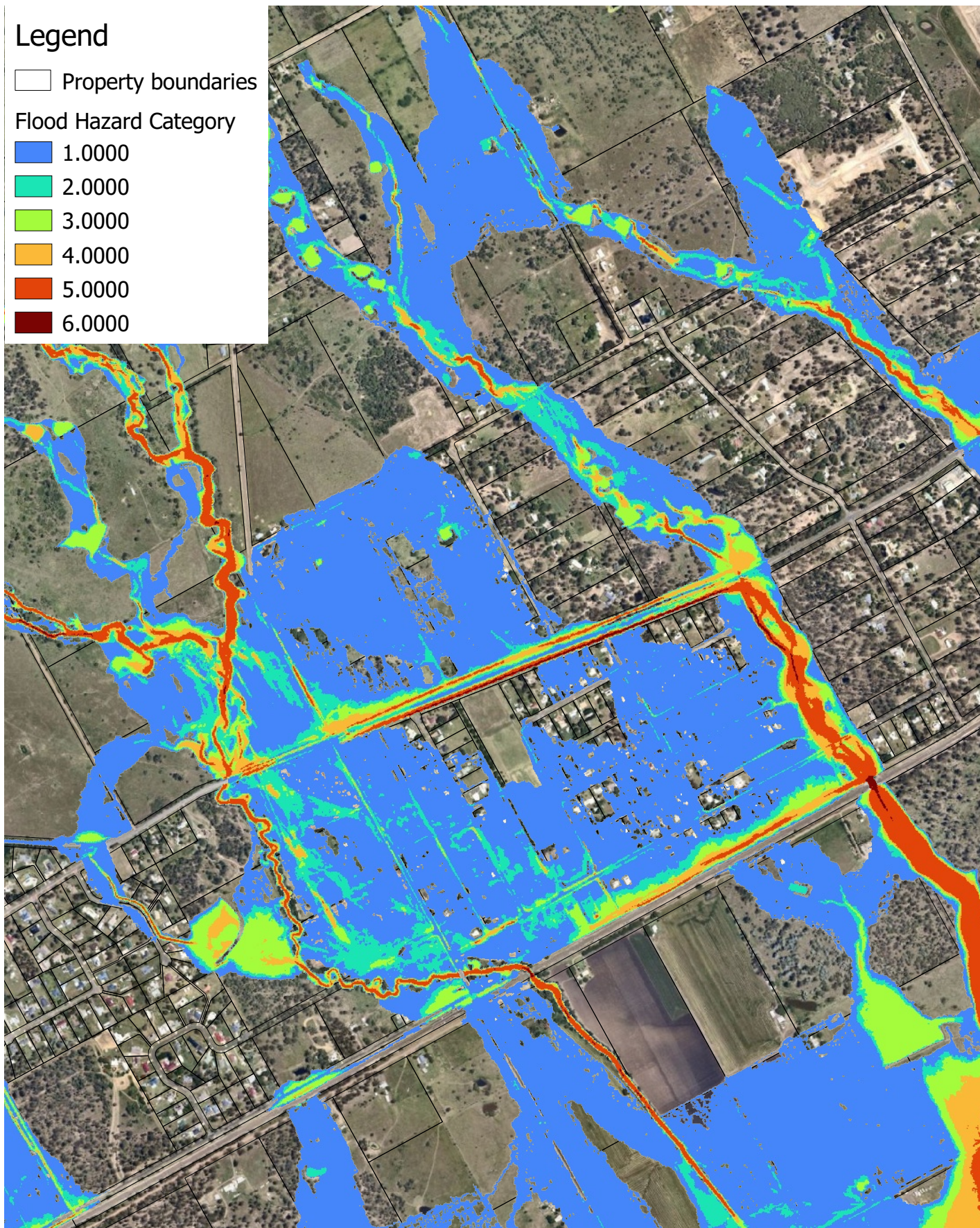
 2.0000

 3.0000

 4.0000

 5.0000

 6.0000



TITLE

Existing - 1% AEP Flood Hazard

PROJECT

Ipswich West



Date
01/04/2026

Drawn
LW

Check
DC

Approved
GE

Scale
1 : 1000

Rev
1

PMF Peak Flood Depths and Levels
(Existing Case)

Thagoona_Boundary

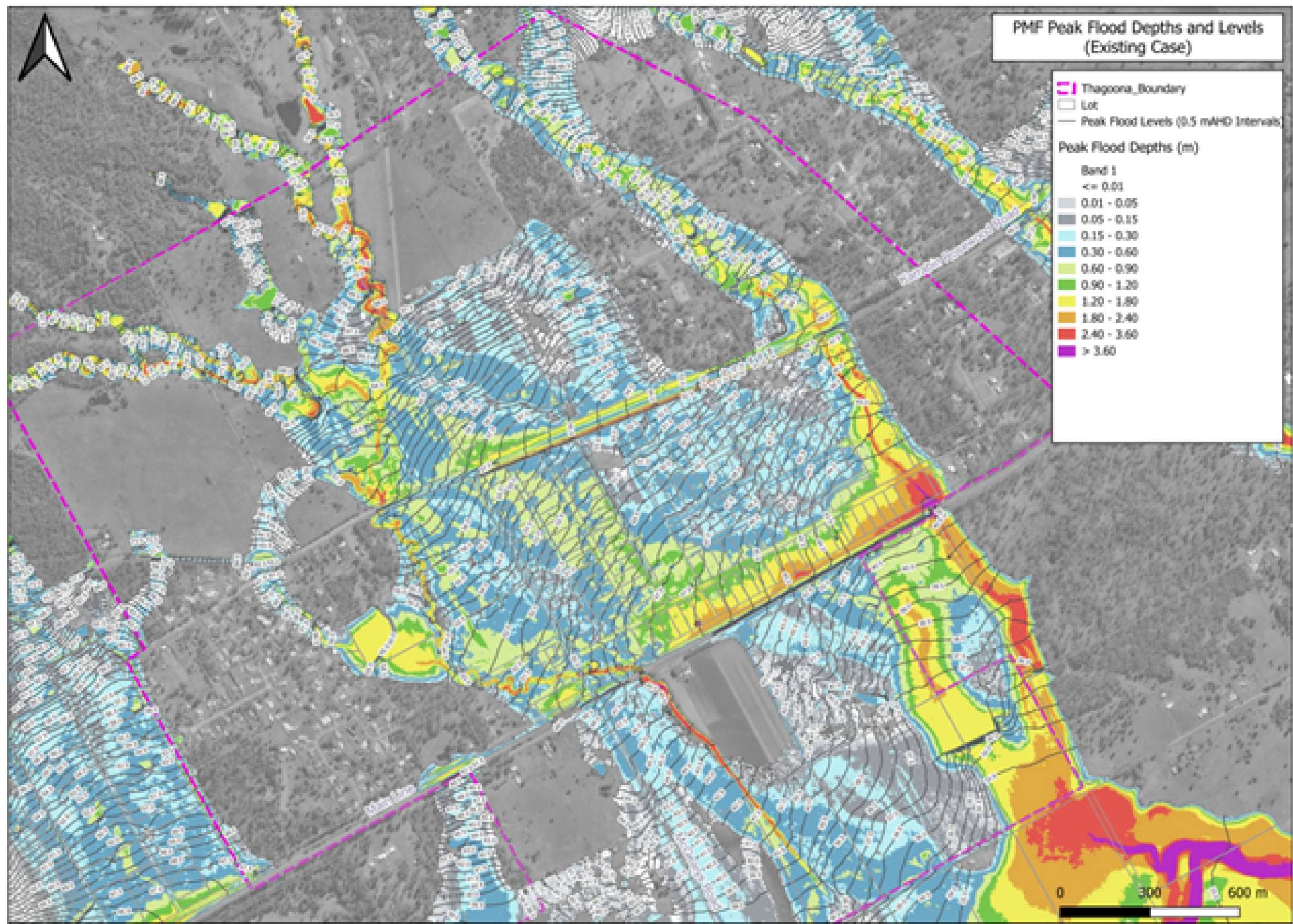
Lot

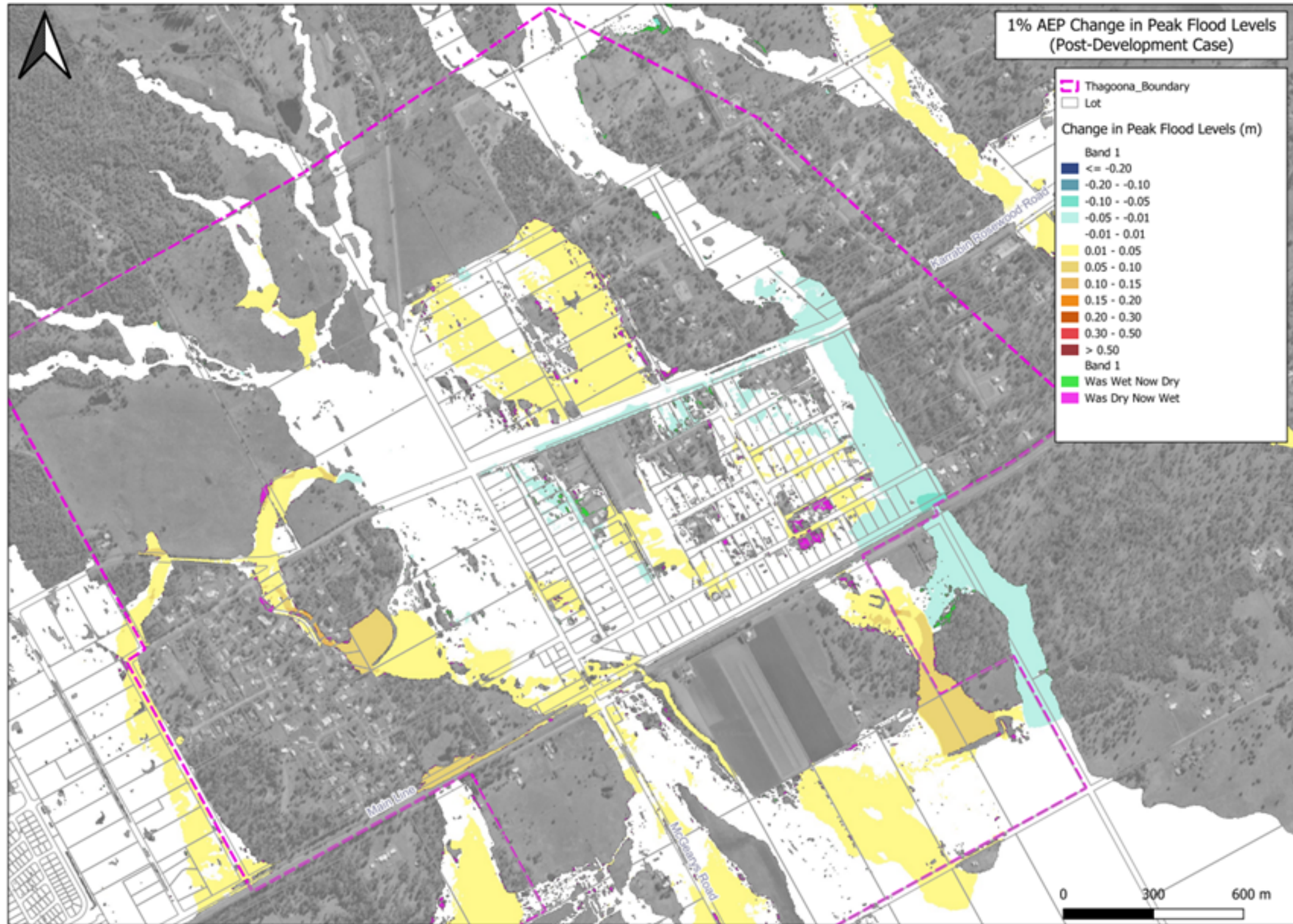
Peak Flood Levels (0.5 mAHDI Intervals)

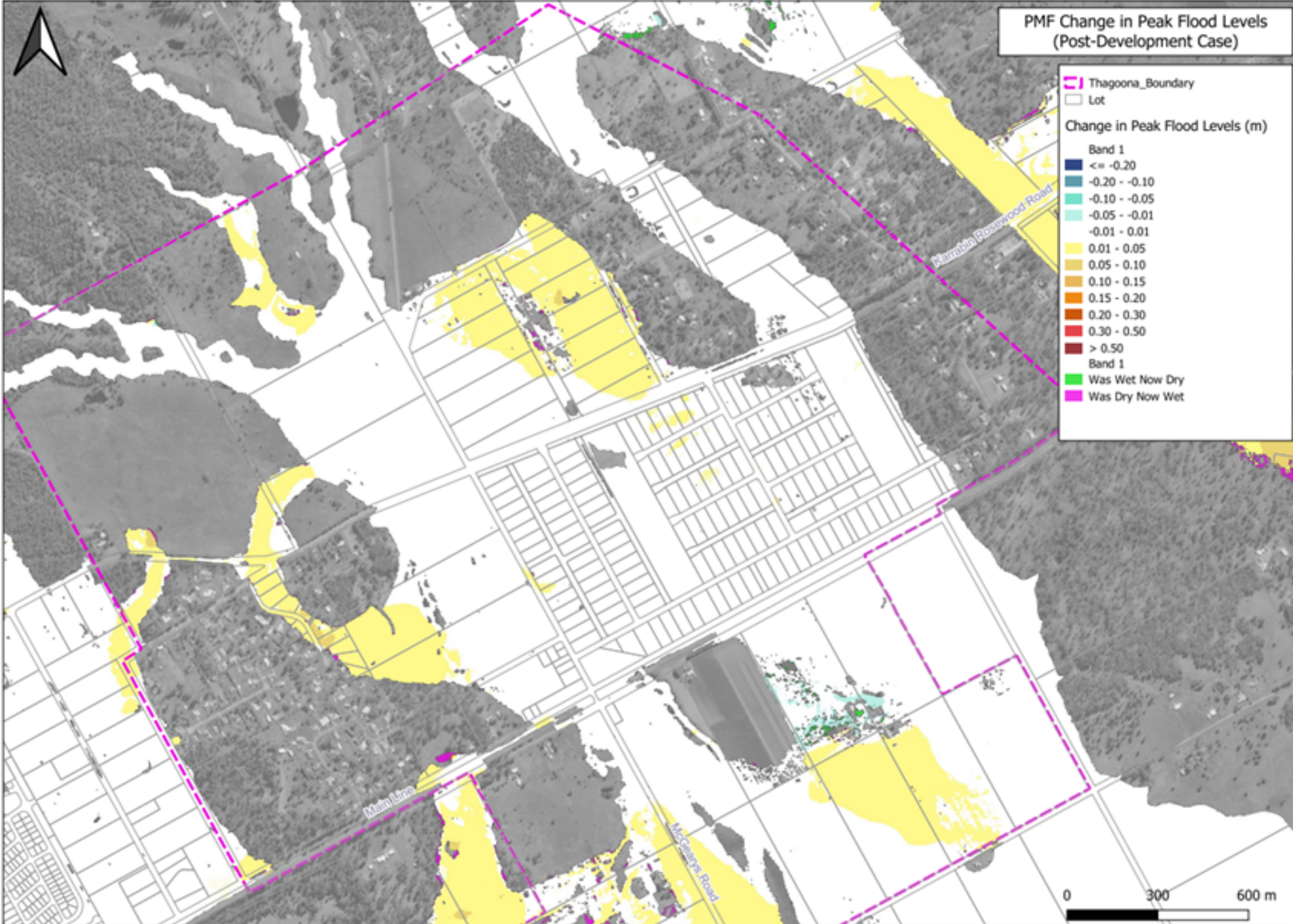
Peak Flood Depths (m)

Band 1

<= 0.01
0.01 - 0.05
0.05 - 0.15
0.15 - 0.30
0.30 - 0.60
0.60 - 0.90
0.90 - 1.20
1.20 - 1.80
1.80 - 2.40
2.40 - 3.60
> 3.60







Legend

Peak Flood Depth

-  ≤ 0.2000
-  0.2000 - 0.5000
-  0.5000 - 1.0000
-  1.0000 - 1.5000
-  > 1.5000
-  Property Boundaries



TITLE

Developed Condition - 1% AEP Peak
Flood Depth (mitigated) (m)

PROJECT

Ipswich West



Date
01/04/2026

Drawn
LW

Check
DC

Approved
GE

Scale
1 : 3000

Rev
1

Legend

 Property boundaries

Afflux (m)

 ≤ -0.100

 $-0.100 - -0.010$

 $-0.010 - 0.010$

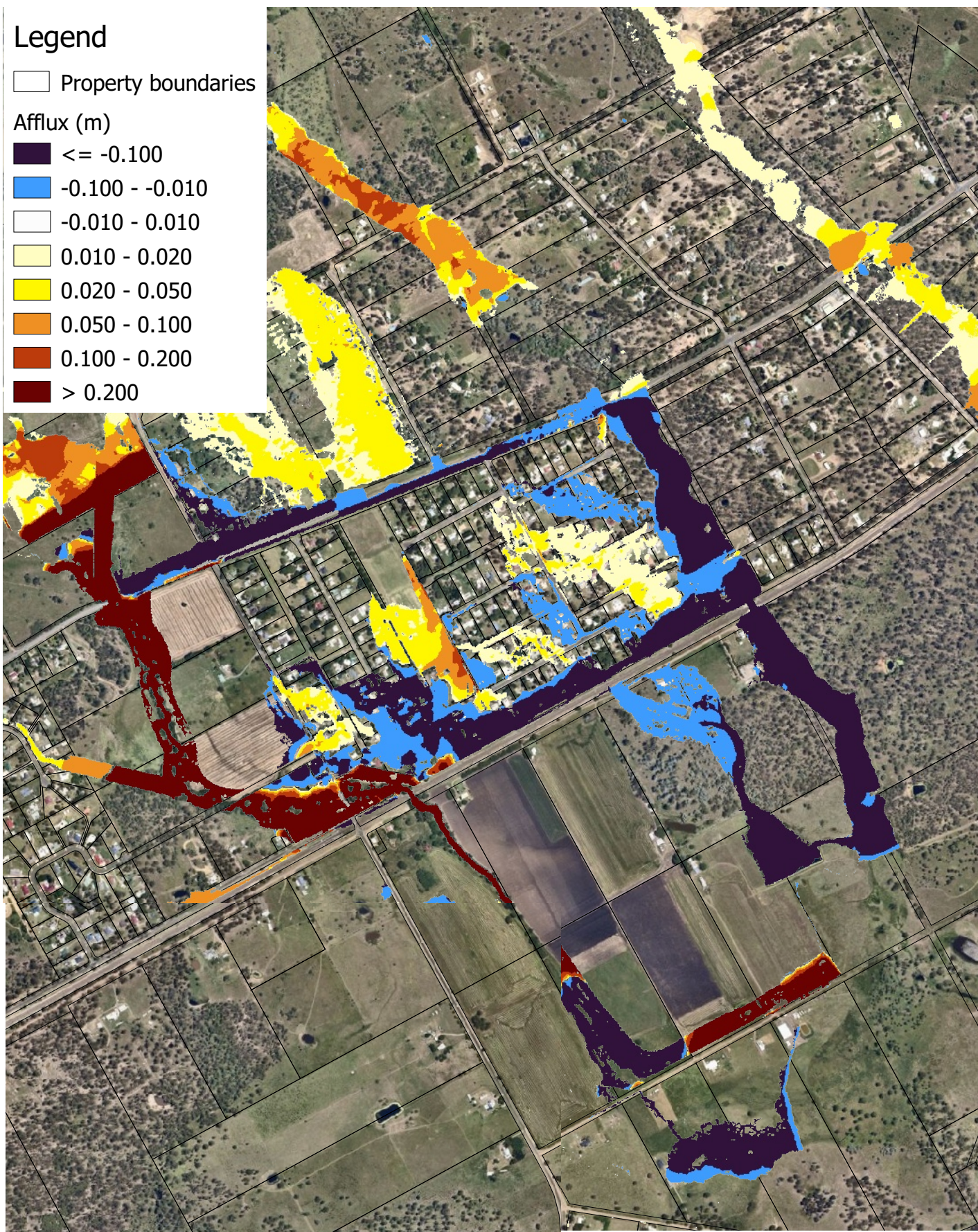
 $0.010 - 0.020$

 $0.020 - 0.050$

 $0.050 - 0.100$

 $0.100 - 0.200$

 > 0.200



TITLE

Developed Condition - 1% AEP Afflux
Flood Depth (mitigated) (m)

PROJECT

Ipswich West



Date
01/04/2026

Drawn
LW

Check
DC

Approved
GE

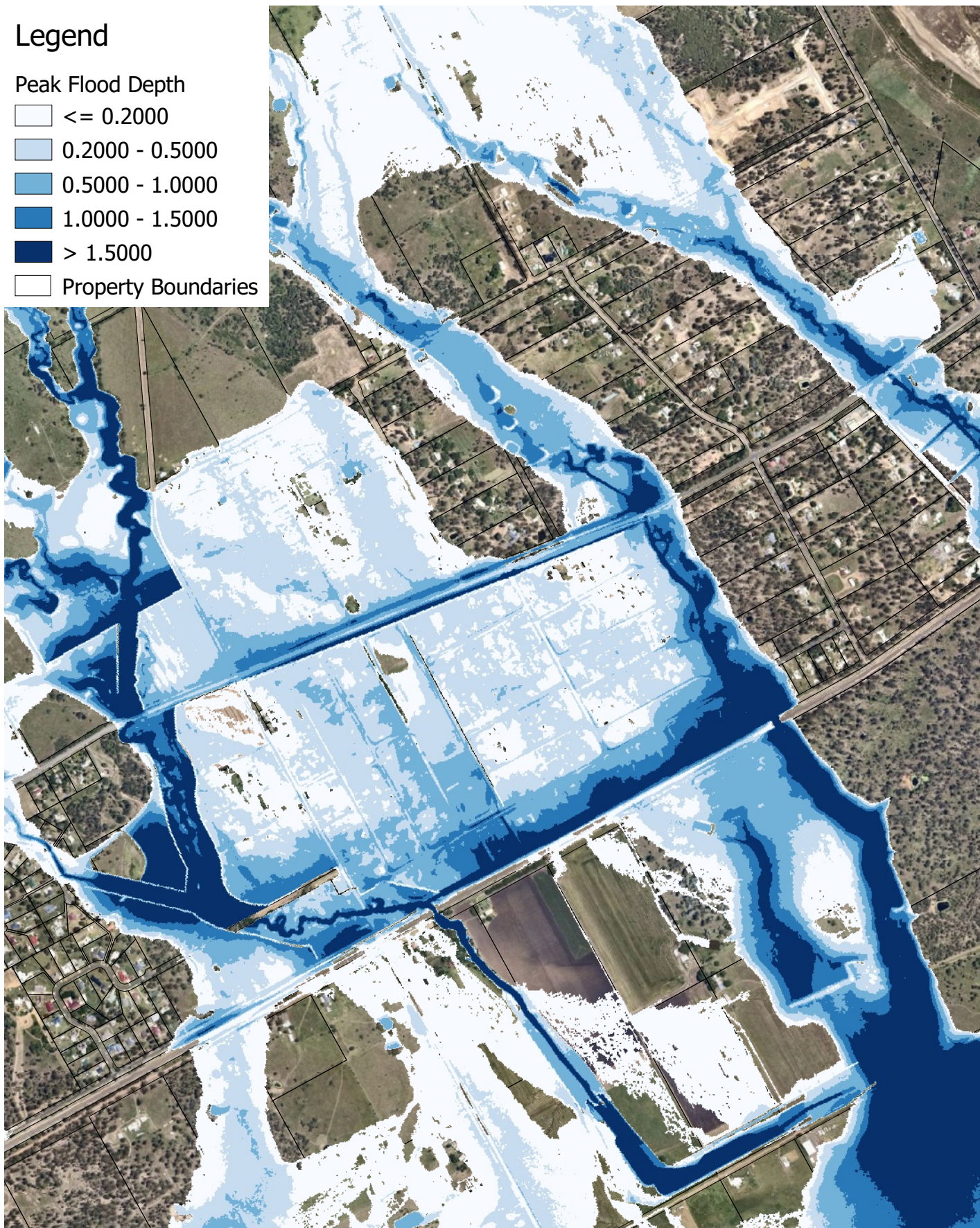
Scale
1 : 3000

Rev
1

Legend

Peak Flood Depth

-  ≤ 0.2000
-  0.2000 - 0.5000
-  0.5000 - 1.0000
-  1.0000 - 1.5000
-  > 1.5000
-  Property Boundaries



TITLE

Developed Condition - PMF Peak Flood
Depth (mitigated) (m)

PROJECT

Ipswich West



Date
01/04/2026

Drawn
LW

Check
DC

Approved
GE

Scale
1 : 3000

Rev
1

Legend

 Property boundaries

Afflux (m)

 ≤ -0.100

 $-0.100 - -0.010$

 $-0.010 - 0.010$

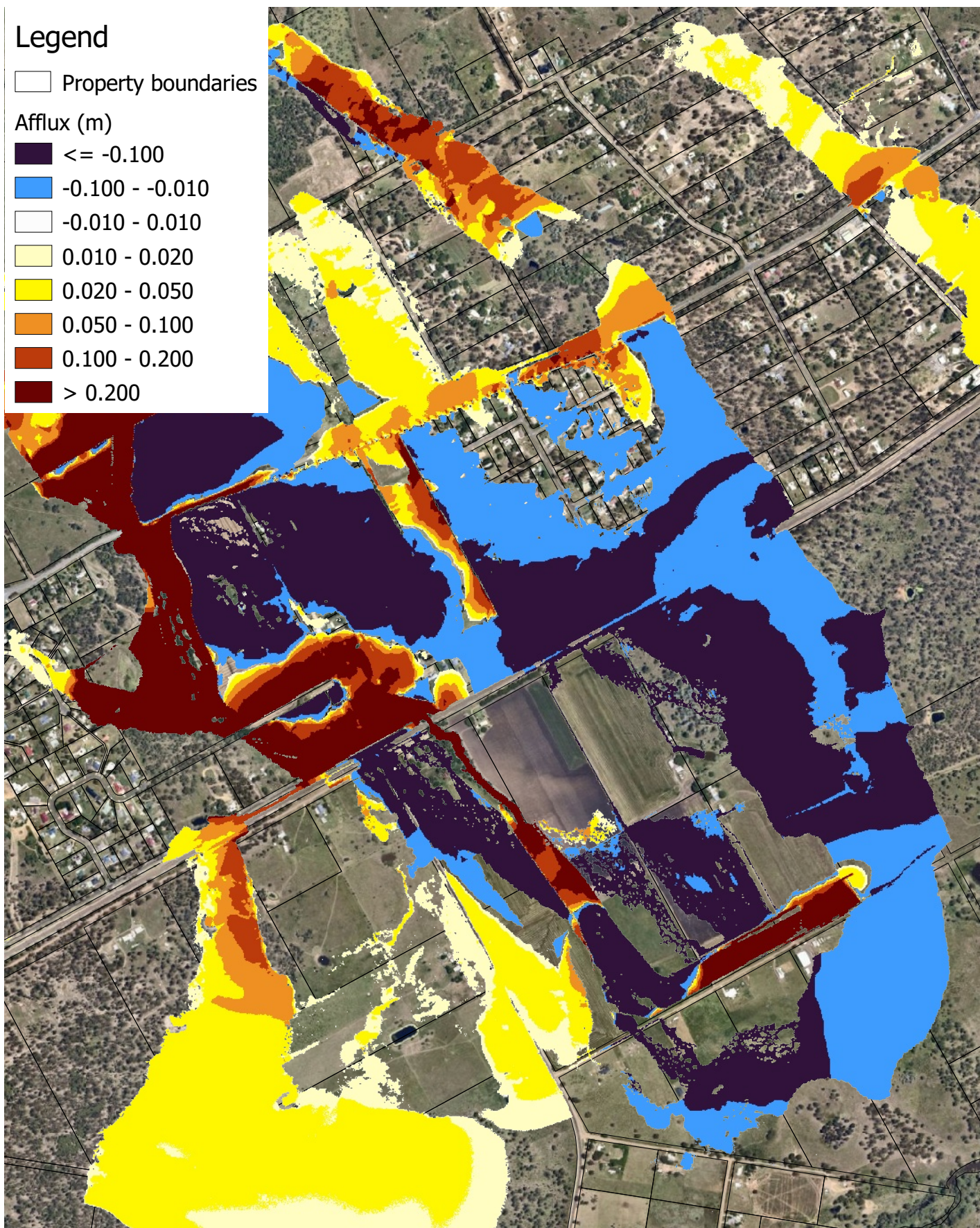
 $0.010 - 0.020$

 $0.020 - 0.050$

 $0.050 - 0.100$

 $0.100 - 0.200$

 > 0.200



TITLE

Developed
PMF afflux (mitigated) (m)

Condition

PROJECT

Ipswich West



Date
01/04/2026

Drawn
LW

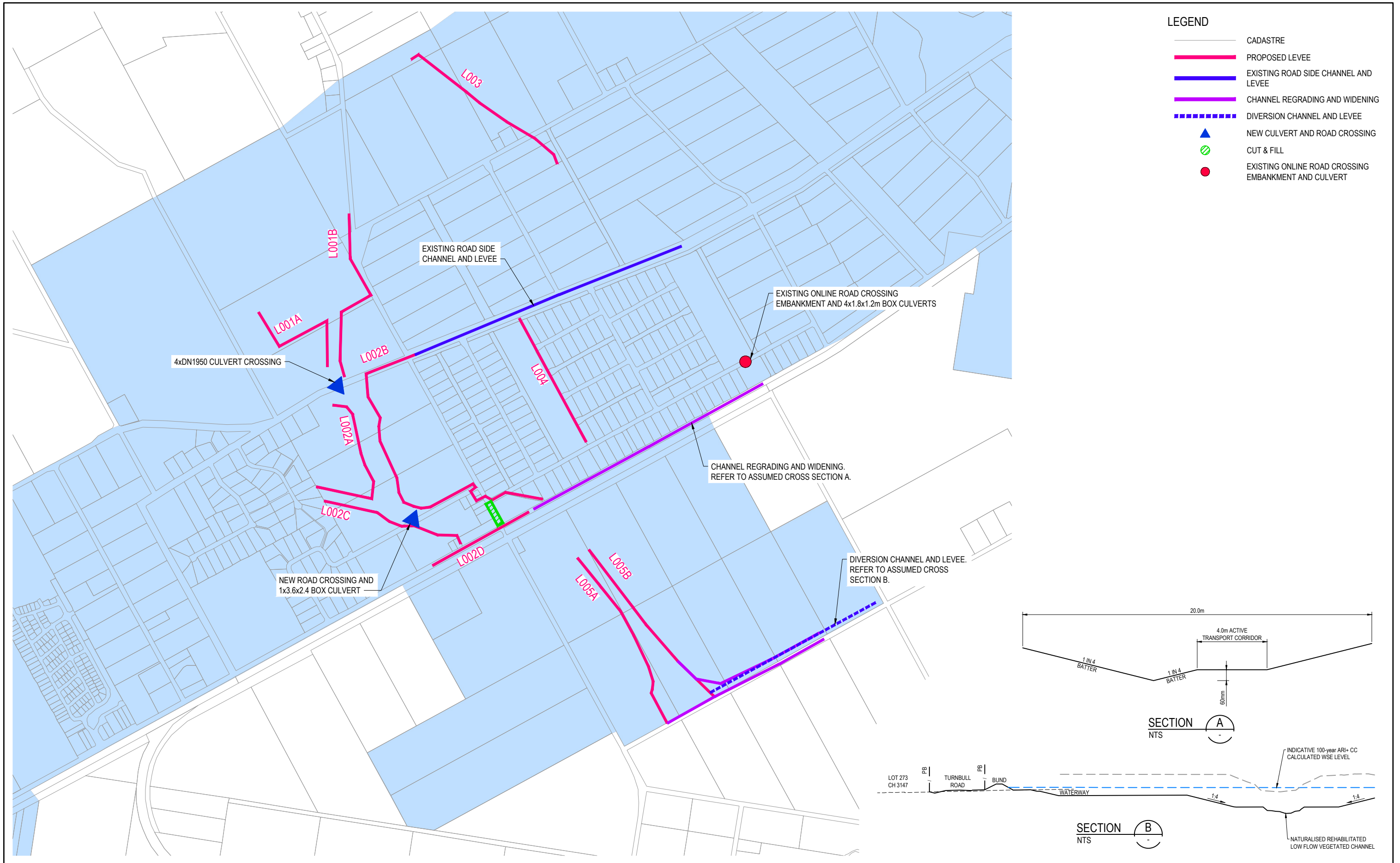
Check
DC

Approved
GE

Scale
1 : 3000

Rev
1

APPENDIX B – MITIGATION WORKS SKETCH



				Scales		Surveyor	Client		Status	Project	
							URBIS LTD		PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	IPSWICH WESTERN CORRIDOR HOUSING PLAN	
						Architect			Original Issue Signatures	Title	
									Drawn	Original Size	A3
									Designed	Height Datum	AHD
									Project Manager	Grid	
									Verified		
01 FOR INFORMATION				DR	CH	VE			THAGOONA FLOOD WORKS SKETCH		Project Number
Issue Description				Date					30250700-AAP-DRG-SKE-0004		30250700
									01		Issue

Date Plotted: 31 Mar 2026 - 02:14pm File Name: C:\Users\mamm0719\OneDrive - ARCADIS\Documents\WFH_MineProjectFiles\30250700 - Ipswich West Corridor Planning\01_WIP\DRG\30250700-AAP-DRG-SKE-0004.dwg