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WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

Report

Ipswich City Council Flood Height Assessment

Ipswich City Council

28 July 2022



Document Status

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1 OVERVIEW AND METHODOLOGY

1.1 Introduction

This addendum to the Fit For Purpose Risk Assessment is for purposes of providing Ipswich City Council (Council) a city wide analysis of flood planning levels with a particular focus on the expected differences between the Adopted Flood Regulation Line (ARFL) level and the modelled 1% Annual Exceedance Probability (AEP) with climate change flood level. This Flood Height Assessment provides Council context for the potential amendment to flood planning level policy settings within the Ipswich City Council Planning Scheme.

1.2 Base data

This Flood Height Assessment analyses Council's corporate dataset that was developed for the AFRL with the 1% AEP plus climate change flood height across all creek and riverine catchments within the Ipswich Local Government Area (LGA).

1.2.1 AFRL Dataset

The Adopted Flood Regulation Line (AFRL) dataset supports land use planning development assessment particularly for the assessment of flood heights and forms the base dataset for property level flood certificates. The dataset is an amalgamation of 3 different flood grids including some interpolated extents:

- 1974 historic flood extent
- 2011 historic flood extent
- Q100 flood model
- Ground level information is based on the 2014 Digital Terrain Modelling (i.e. not latest 2019 LIDAR) but is available against all affected parcels.

The AFRL dataset provided by Council (19 April 2022) contains the following information for over 97,000 properties in the Ipswich LGA:

- Lot Plan number
- Street address
- Historic and modelled flood analysis (True / False)
  - 1974 Affected
  - 2011 Affected
  - Q20 Affected
  - Q100 Affected
  - AFRL Affected
- Minimum and maximum ground levels (mAHD)
- Flood level data:
  - 1974 flood level (mAHD)
  - 2011 flood level (mAHD)
  - Q20 flood level (mAHD)
  - Q100 flood level (mAHD)

1.2.2 1% AEP plus climate change flood level

The methodology adopted for climate change is in accordance with the Inland Flooding Study report (DNRM, 2010). This correlates with Australian Rainfall and Runoff (AR&R) 1987 methodologies which infers for every degree of global warming apply a 5% increase in rainfall intensity within the models.

This is also considered to align with the Intergovernmental Panel on Climate Change's 'Representative Concentration Pathway' (RCP) 8.5 which assumes a sea level rise of 0.8 metres and a 20% increase in rainfall intensity for the year 2090.

The following 1%AEP climate change grids were used in the analysis:

- IRFSU 1% AEPCC
- Brisbane River 1 % AEPCC
- Bundamba Creek 1%AEPCC
- Sandy Creek 1%AEPCC
- Western Creek 1%AEPCC
- Warrill Creek 1%AEPCC
- Goodna Creek 1%AEPCC
- Walloon 1%AEPCC
- Black Snake Creek 1%AEPCC
- Rosewood / Thagoona 1%AEPCC
- Tallegalla 1%AEPCC
- Purga Creek 1%AEPCC
- Woogaroo Creek 1%AEPCC
- Six Mile Creek1%AEPCC
- Frankin Vale Creek1%AEPCC
- Deebing Creek 1%AEPCC; and
- Mihi Creek1%AEPCC

The grids were combined to create a "MAX MAX" of 1%AEP climate change flood heights. I.e. where regional riverine flooding is dominant, the maximum surface was taken in preference to the local creek flood height.

Peak flood level difference mapping shown between the1% AEP plus climate change and the 1% AEP flood event is provided in the Ipswich Integrated Catchment Plan (IICP).

1.3 Assumptions and limitations

- The data was used as supplied, no modelling was undertaken for this project.
- This flood height assessment does not seek to replicate the work undertaken in the IICP, but analyse the adopted flood planning levels on a property by property scale. It is therefore noted that there could be significant variations of flood level across large rural lots and the ARFL will assign one flood planning level (1974, 2011 or existing Q100 flood model). When mapping the quantum of difference between the ARFL and the 1%AEP plus climate change therefore, there might be significant difference

2 RESULTS

2.1 Difference mapping

The flood height assessment maps show the difference between the AFRL and 1% AEP climate change for each of the Local Area Frameworks across the LGA. The results present the height difference as:

- AFRL greater than 1 %AEP climate change by:
  - 0m to 0.5m
  - 0.5m to 1m
  - 1m to 2.5m
  - 2.5m to 5m
  - 5 to 7.5m
  - 7.5m to 10m
  - Greater than 10m

Where the 1% AEP climate change level is higher than the AFRL the flood extent is mapped as blue. For example as shown in Figure 2-1, in Mount Mort, Lower Mount Walker and Mount Walker West there are some properties where the AFRL is between 0.5m and 1m higher than the 1% AEP climate change level.

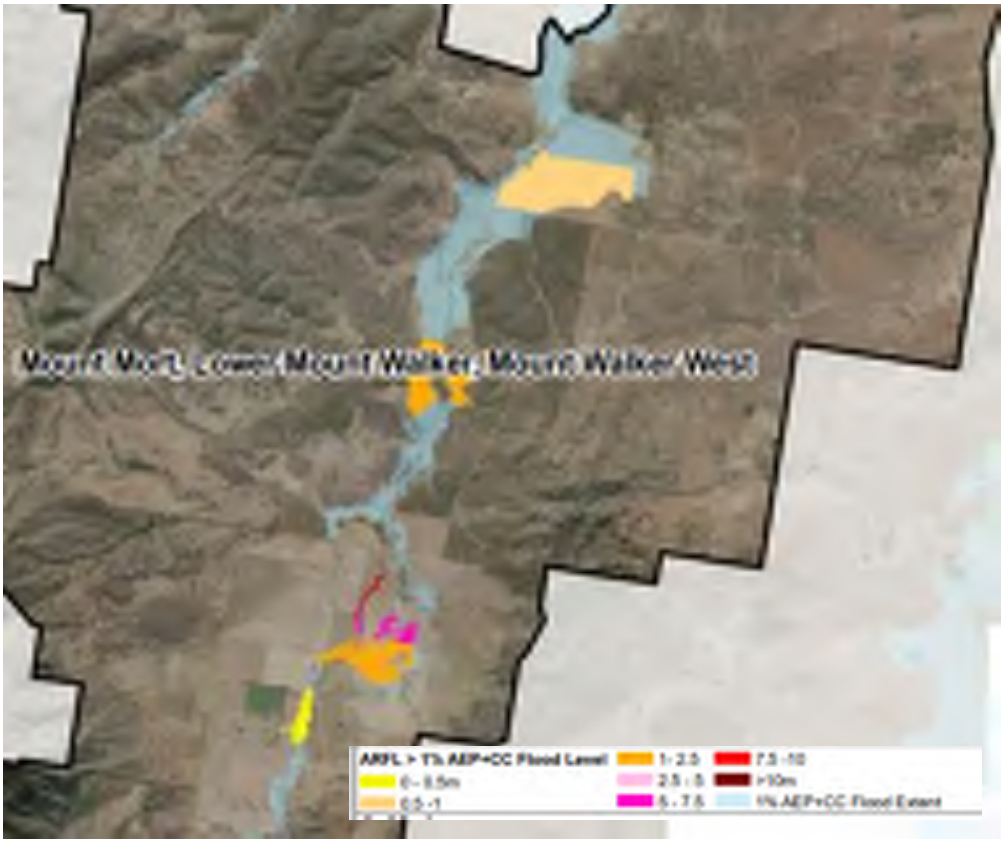


Figure 2-1 AFRL and climate change difference map excerpt in Mount Mort, Lower Mount Walker and Mount Walker West

2.2 Discrepancy

In the Local Area Framework of Goodna, Gailes and Camira (part), there is an anomaly in the difference mapping picked in the review process.

In the suburb of Gailes, in the Tiemens Street locality south of the motorway as shown in Figure 2-2, the ARFL is between 1 and 5 metres higher than the 1%AEP climate change.

This area is mapped in the Goodna Creek local model, however it would appear that Brisbane River flood model did not include the culvert structure under the motorway and subsequently, the low-lying area immediately south of the motorway have not been included in the results.

Interrogation of the elevation data in the area reveal the ground levels are comparative to the north of the motorway, where flooding has been mapped. It is therefore assumed that floodwaters via backflow through the culvert and stormwater system would occur causing inundation.

- Historic flood data in the AFRL dataset shows the level of the 1974 flood event was 18.4m AHD in this area
- The Brisbane River flood modelled 1%AEPCC to the north of the motorway has a flood height of 18.7m AHD.
- The Goodna Creek local flood model 1%AEPCC has a flood height of approx.15.3m AHD.

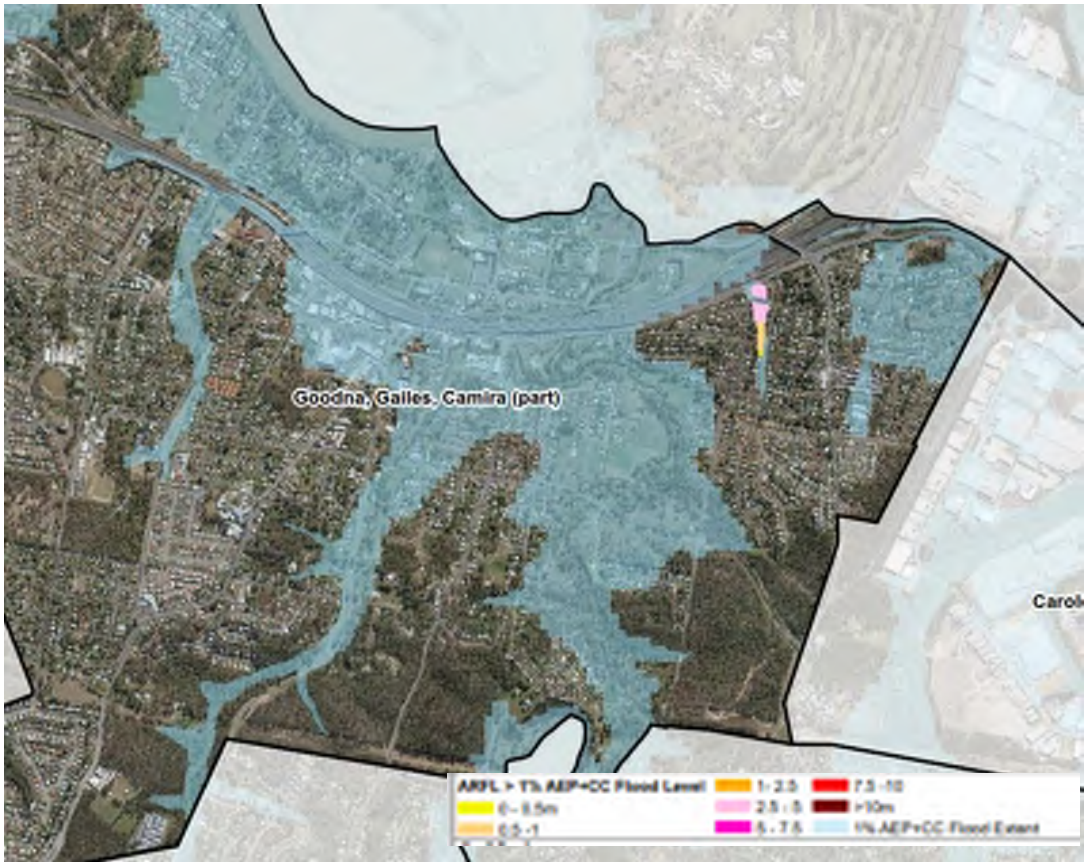


Figure 2-2 AFRL and climate change difference map excerpt in Goodna, Gailes, Camira (part)

3 SUMMARY

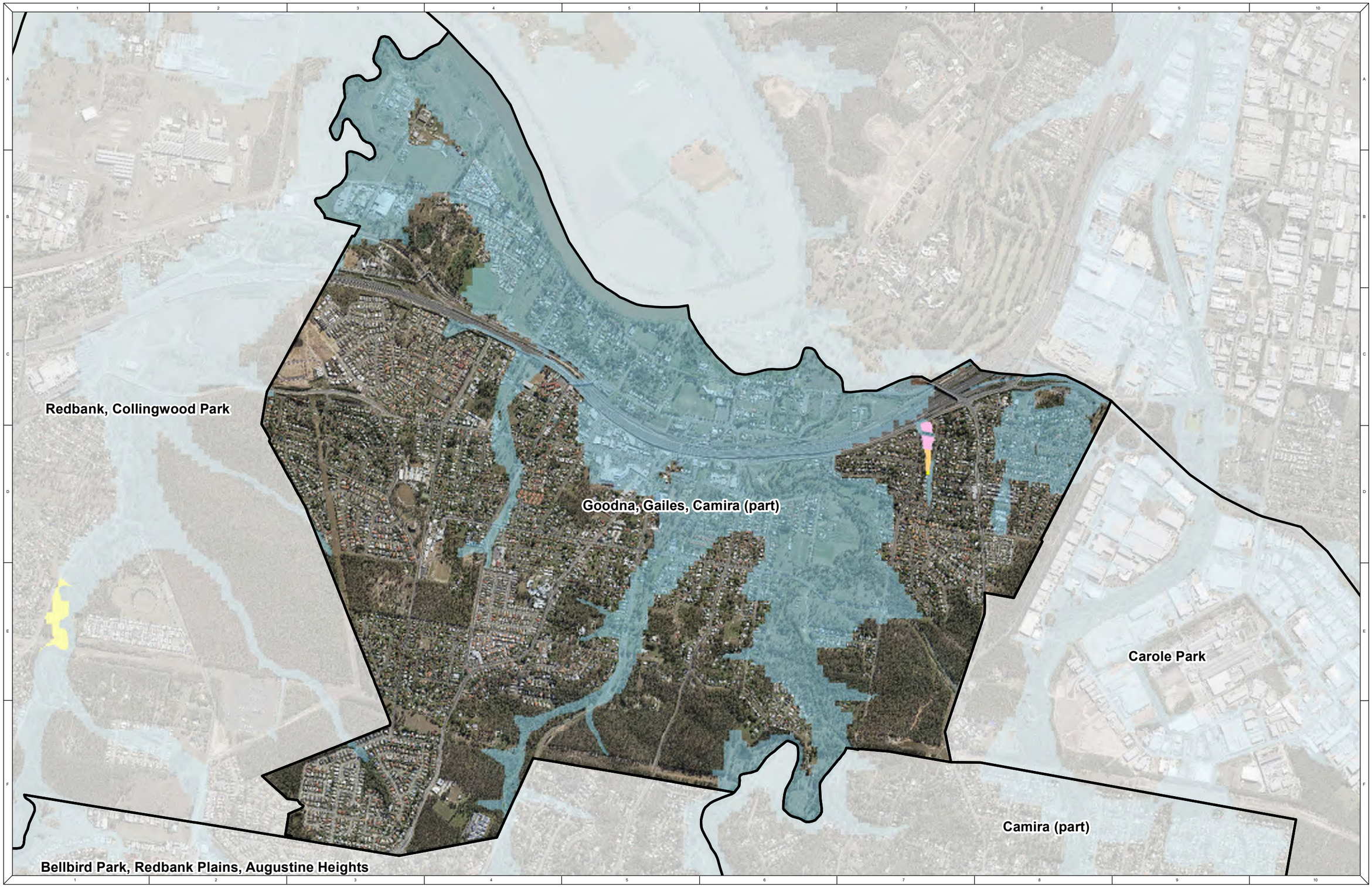
Council has undertaken an assessment of the Adopted Flood Regulation Line (AFRL) flood levels and 1% AEP climate change flood level across the LGA to inform discussions regarding the policy setting for a defined flood event and to inform flood planning levels within the Ipswich City Council Planning Scheme.

The difference mapping for 30 Local Area Frameworks is presented in Appendix A of this Report Addendum.

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APPENDIX A
FLOOD HEIGHT ASSESSMENT DIFFERENCE MAPPING





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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:18,480 at A3

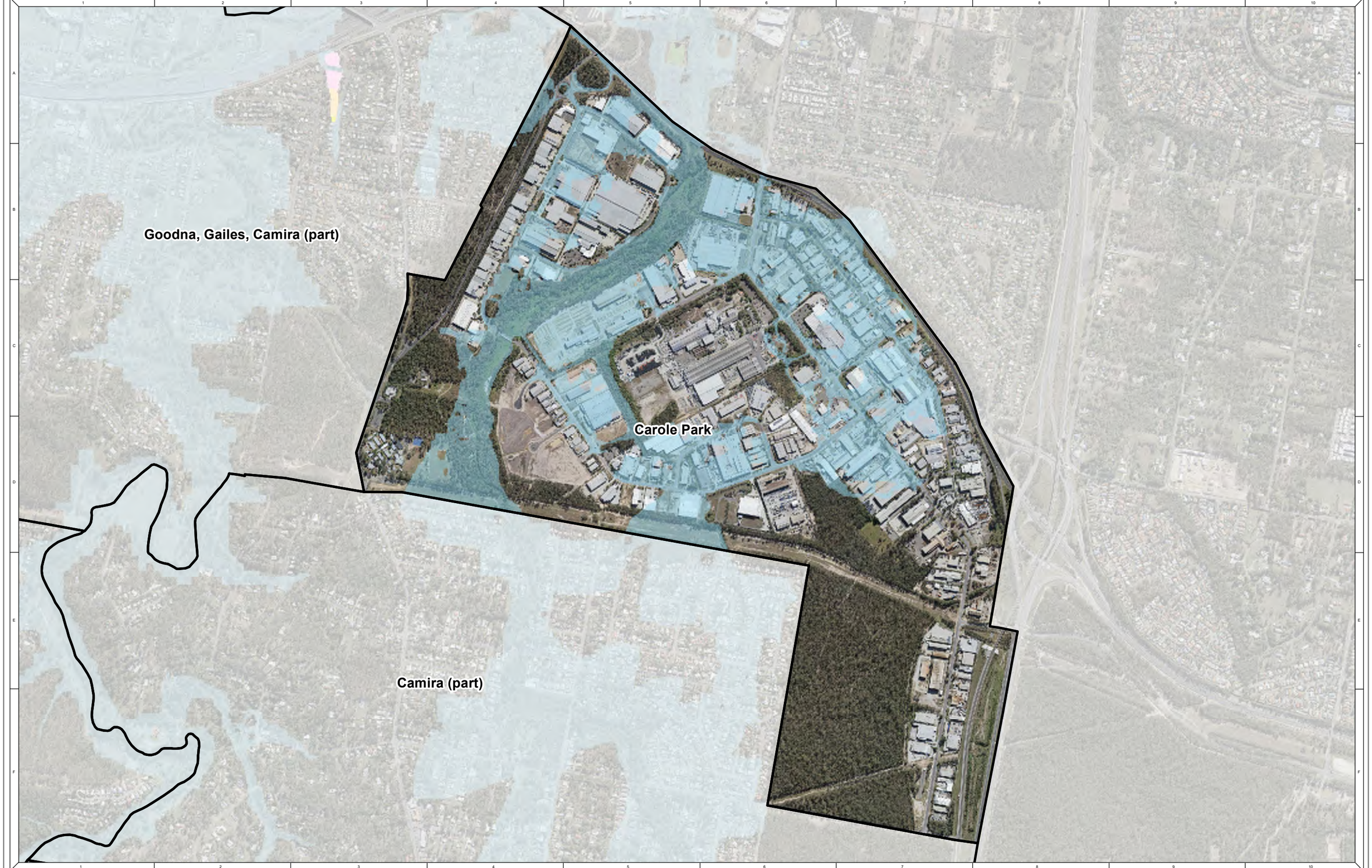
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Goodna, Gailes, Camira (part)

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:14,210 at A3

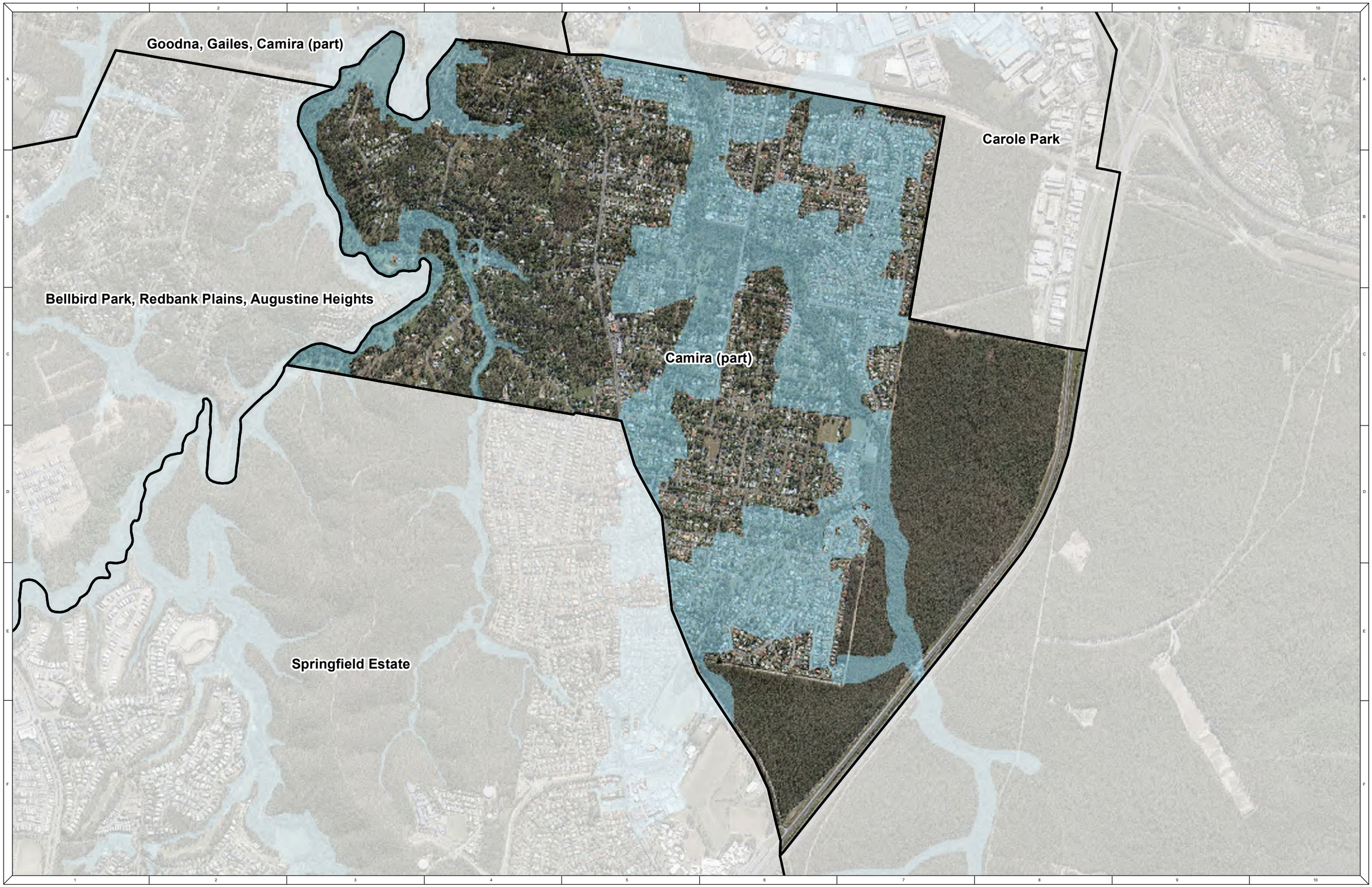
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Carole Park

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

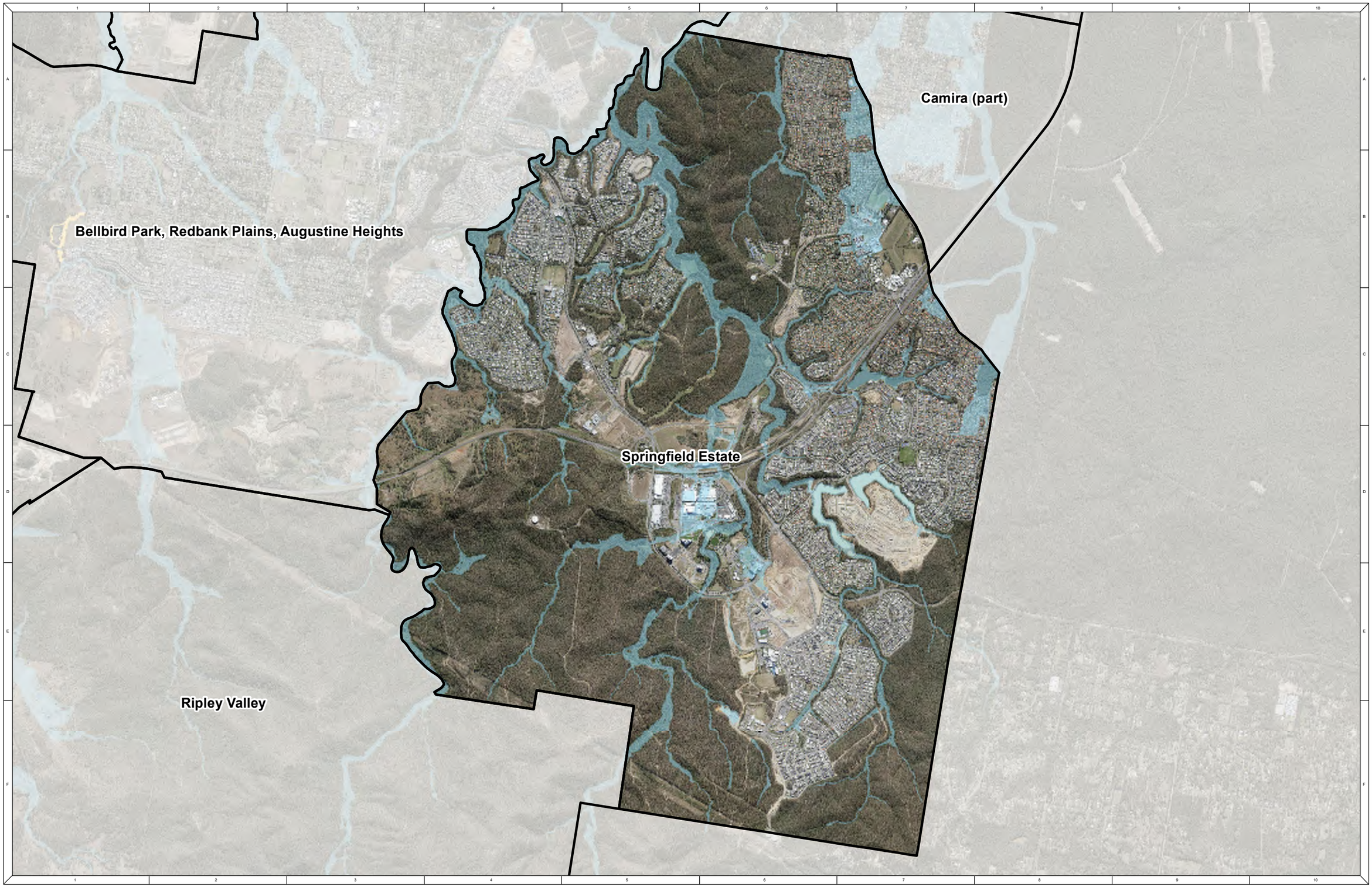
1:17,010 at A3

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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Camira (part)

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:34,500 at A3

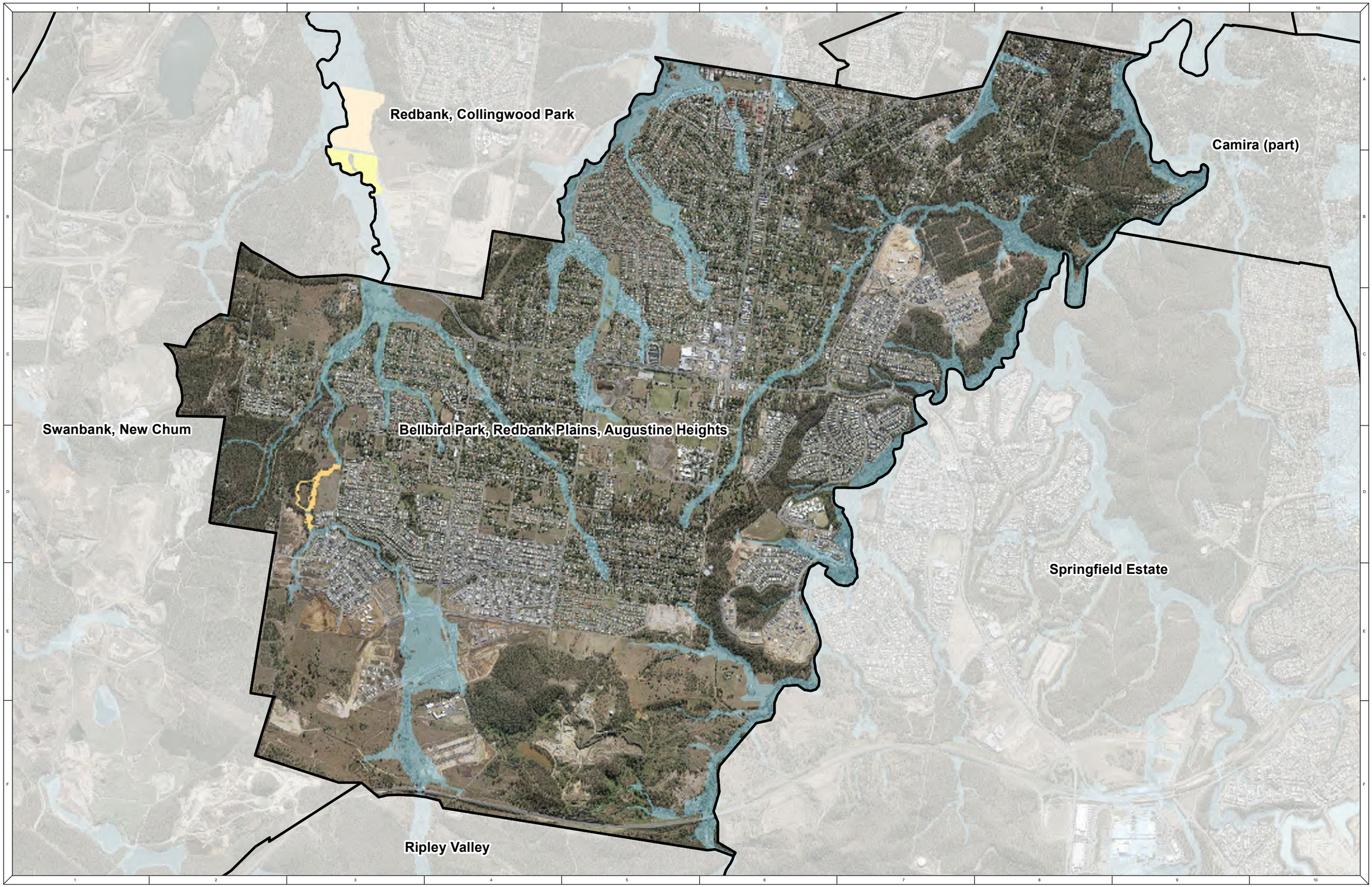
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Springfield Estate

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:26,710 at A3

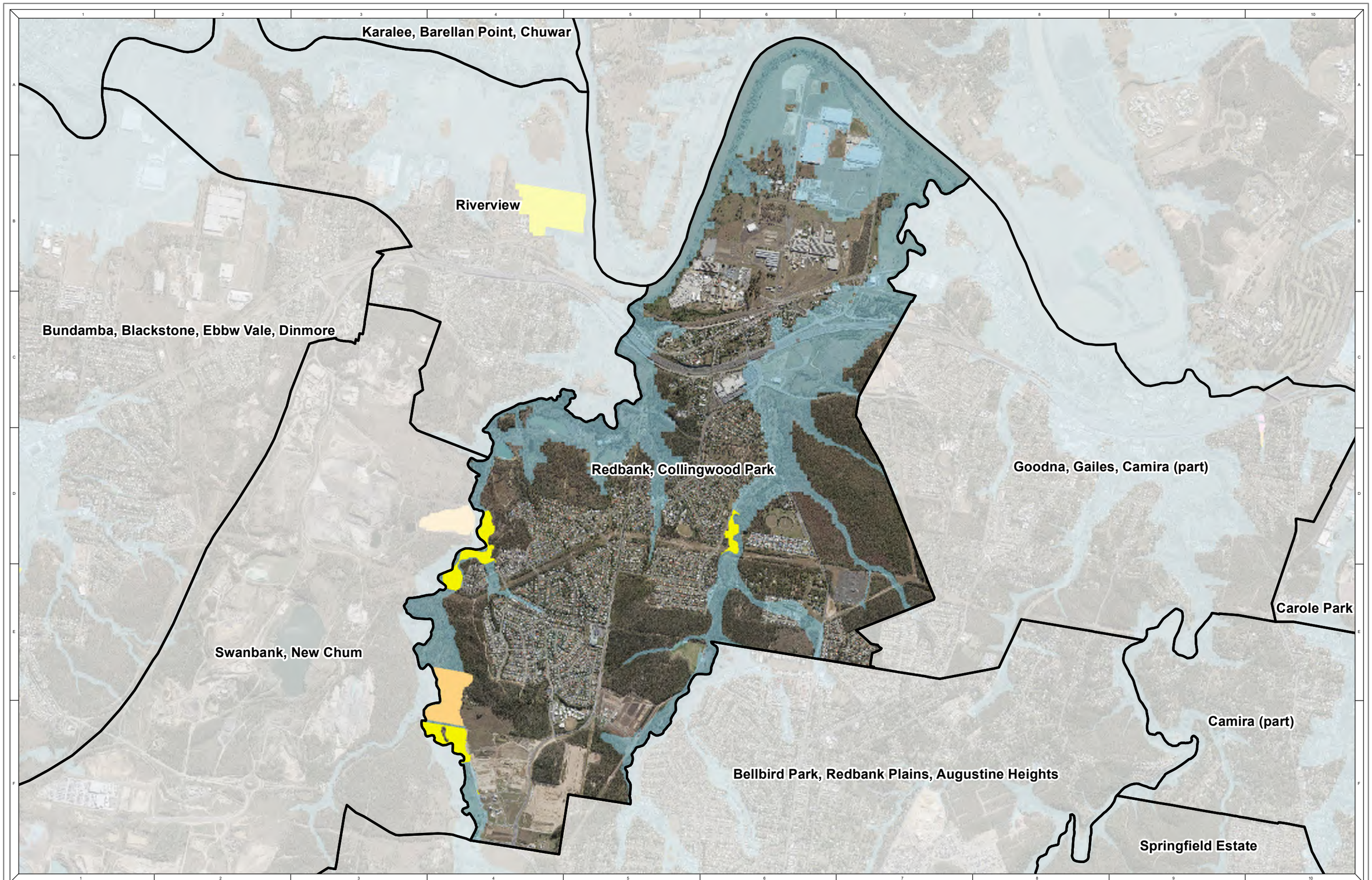
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Bellbird Park, Redbank Plains, Augustine Heights

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:30,090 at A3

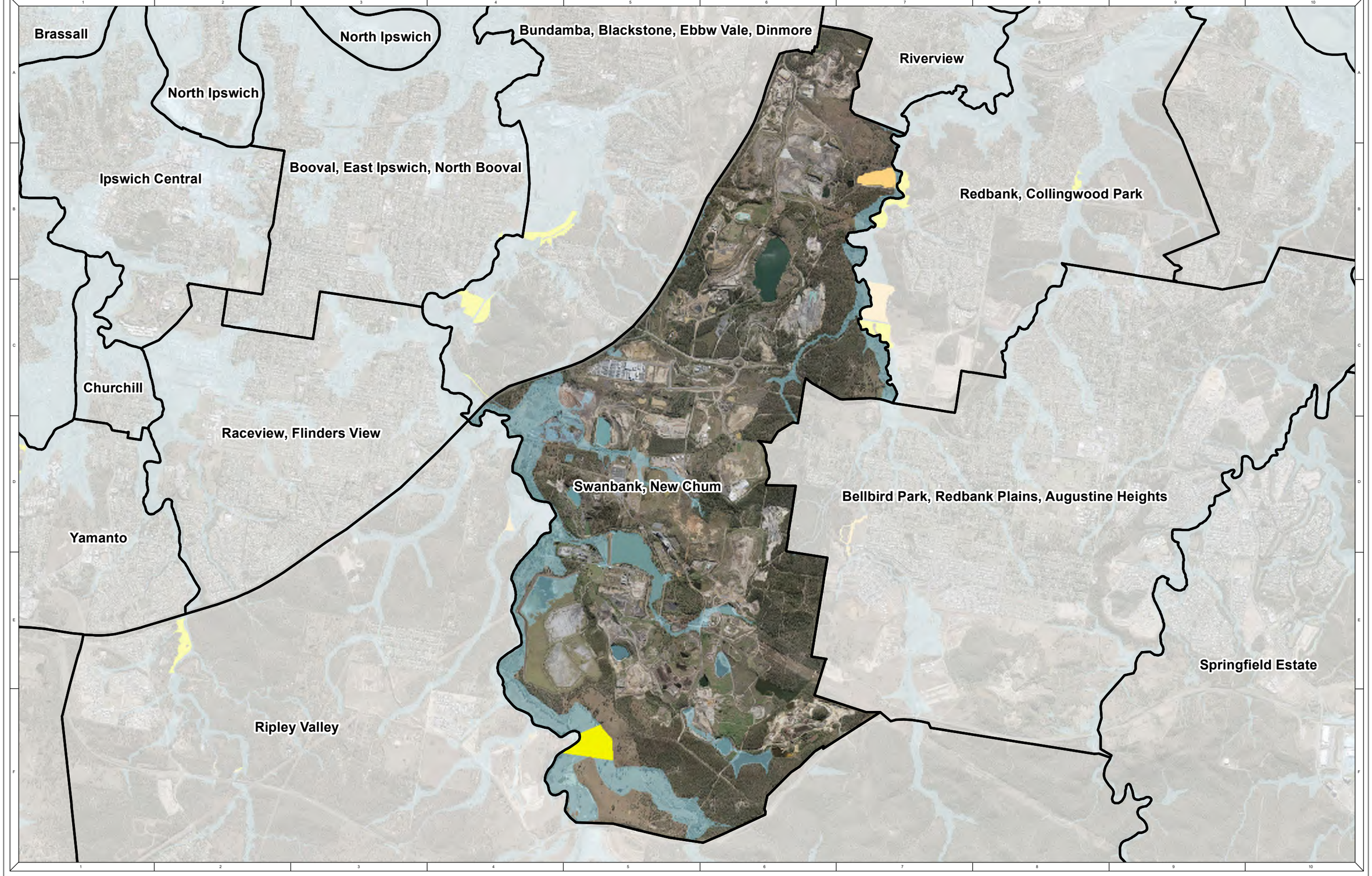
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Redbank, Collingwood Park

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:42,820 at A3

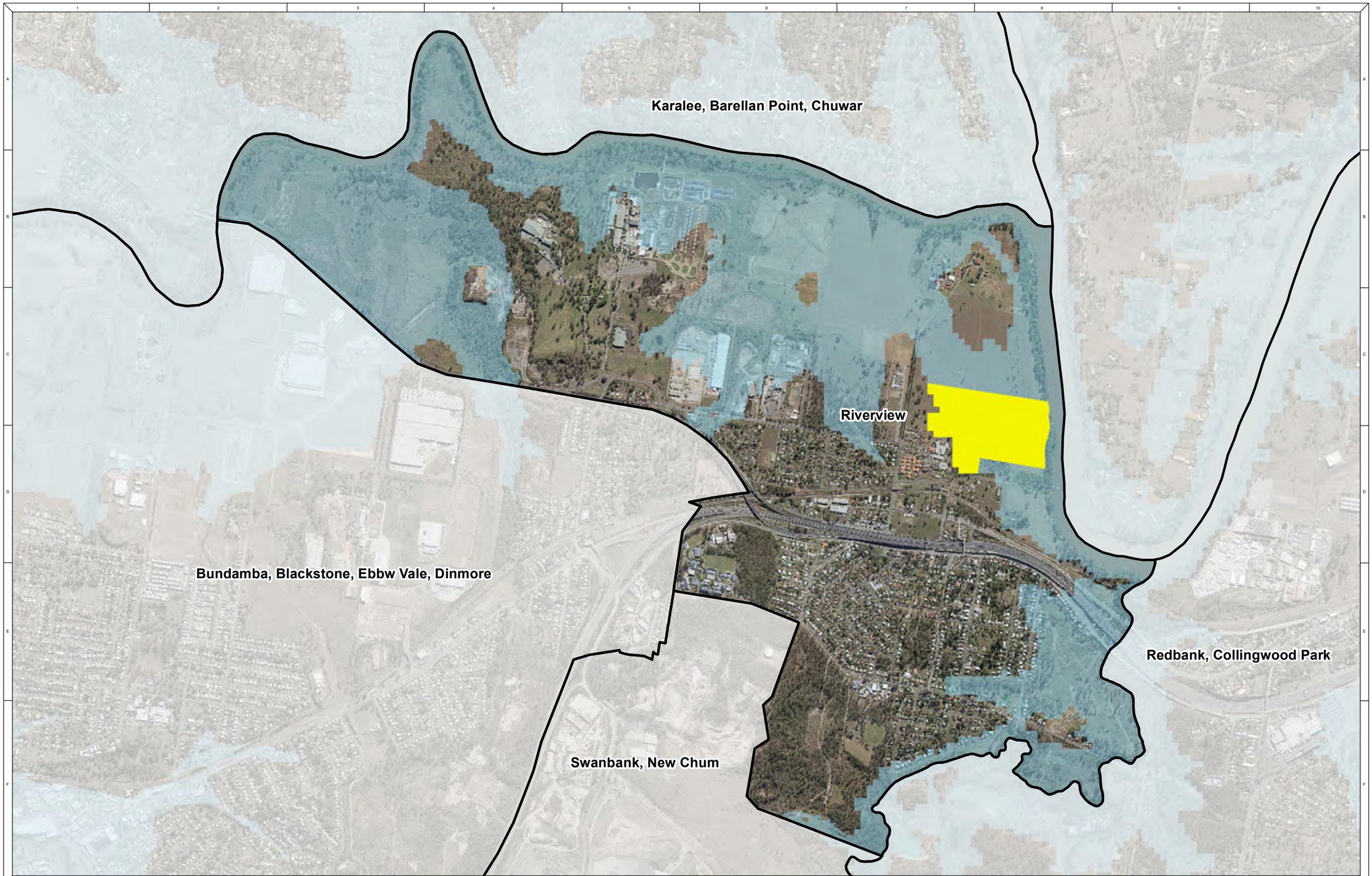
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Swanbank, New Chum

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:17,640 at A3

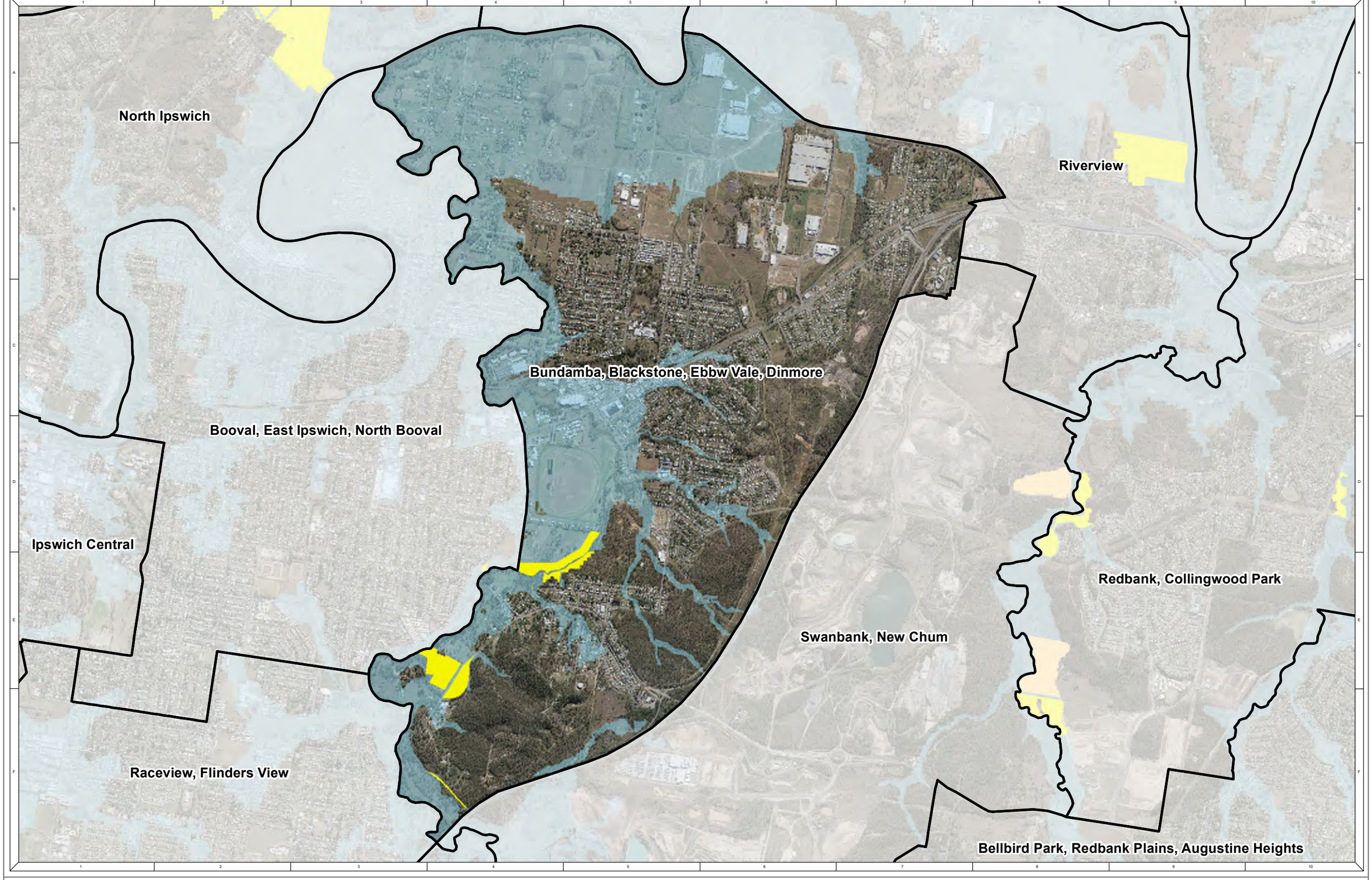
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Riverview

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:28,860 at A3

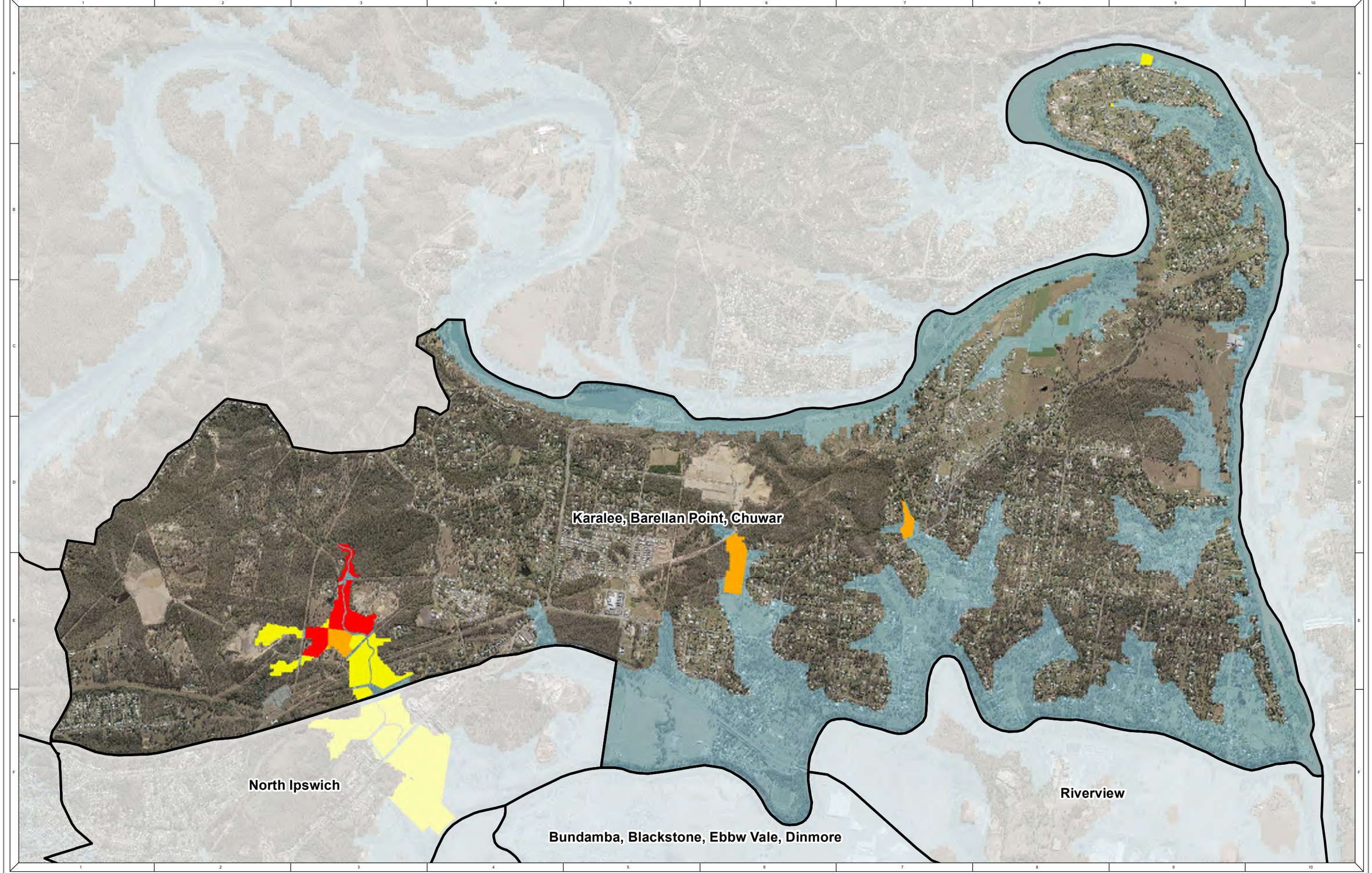
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AFRL > 1% AEP+CC : Bundamba, Blackstone, Ebbw Vale, Dinmore

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:28,400 at A3

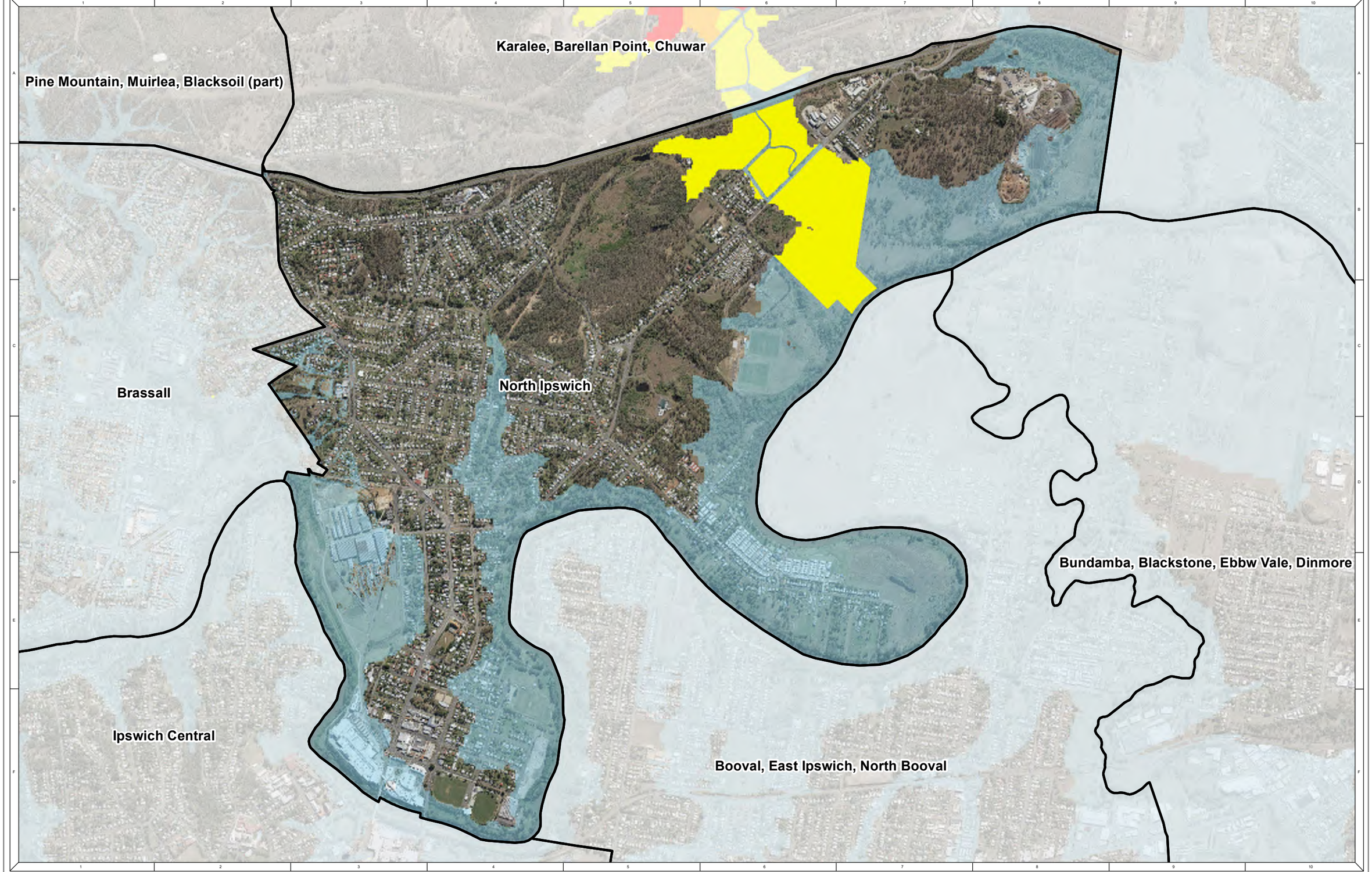
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AFRL > 1% AEP+CC : Karalee, Barellan Point, Chuwar

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:18,720 at A3

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AFRL > 1% AEP+CC : North Ipswich

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Pine Mountain, Muirlea, Blacksoil (part)

Brassall

North Ipswich

Karrabin, Blacksoil (part)

Ipswich Central

One Mile, Leichhardt, Wulkuraka

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- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:12,160 at A3

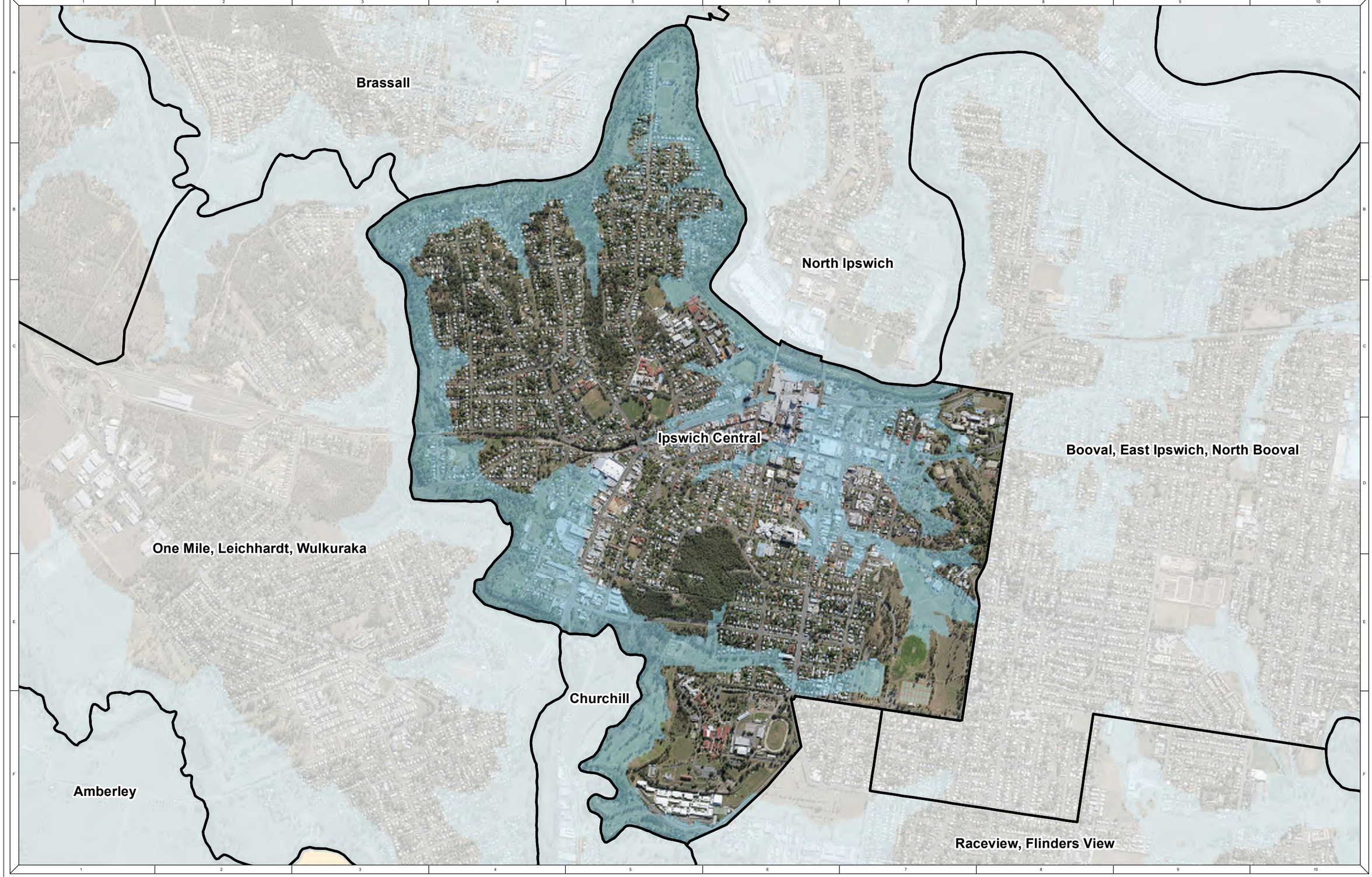
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Brassall

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:18,880 at A3

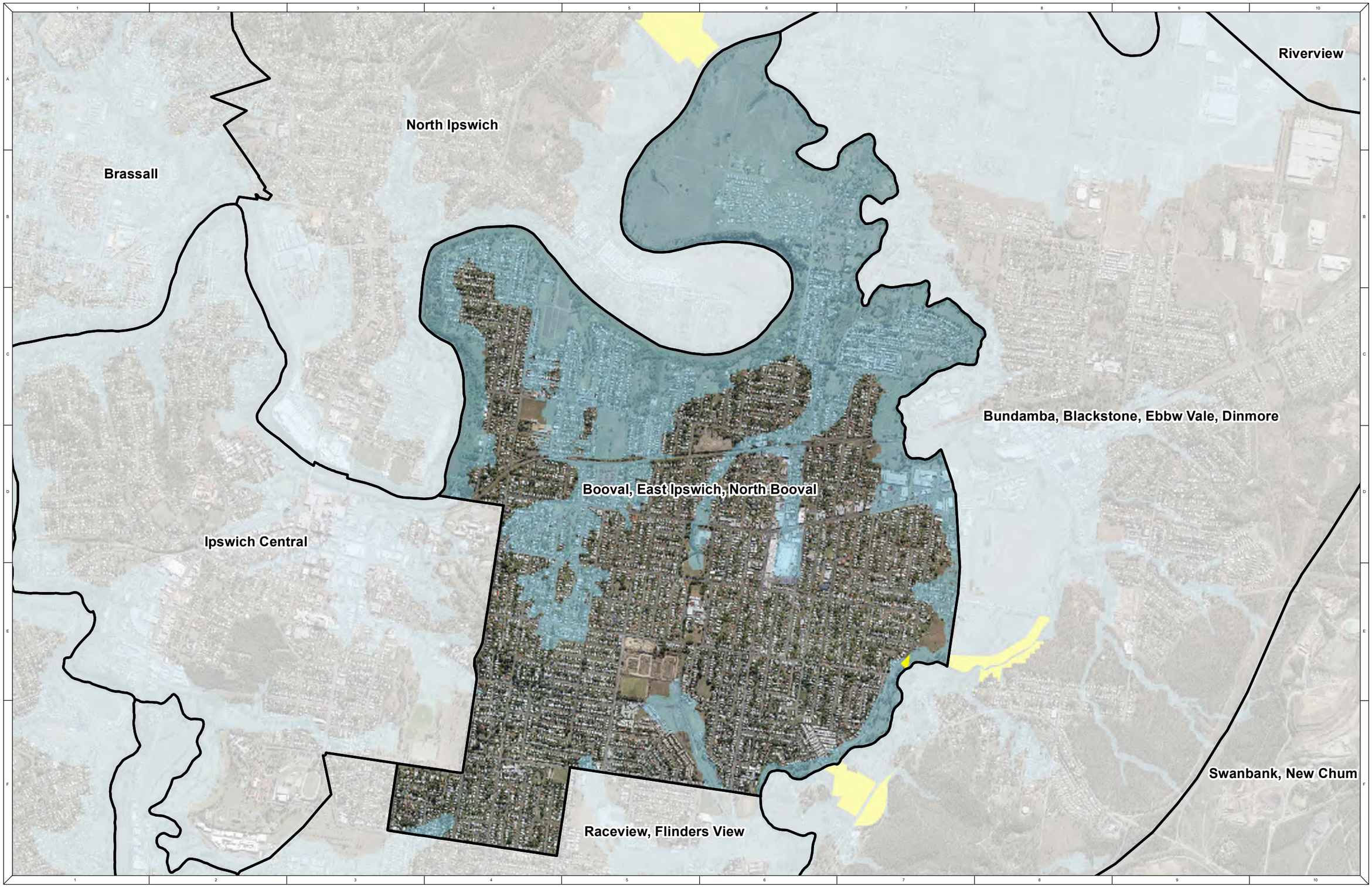
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Ipswich Central

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:23,190 at A3

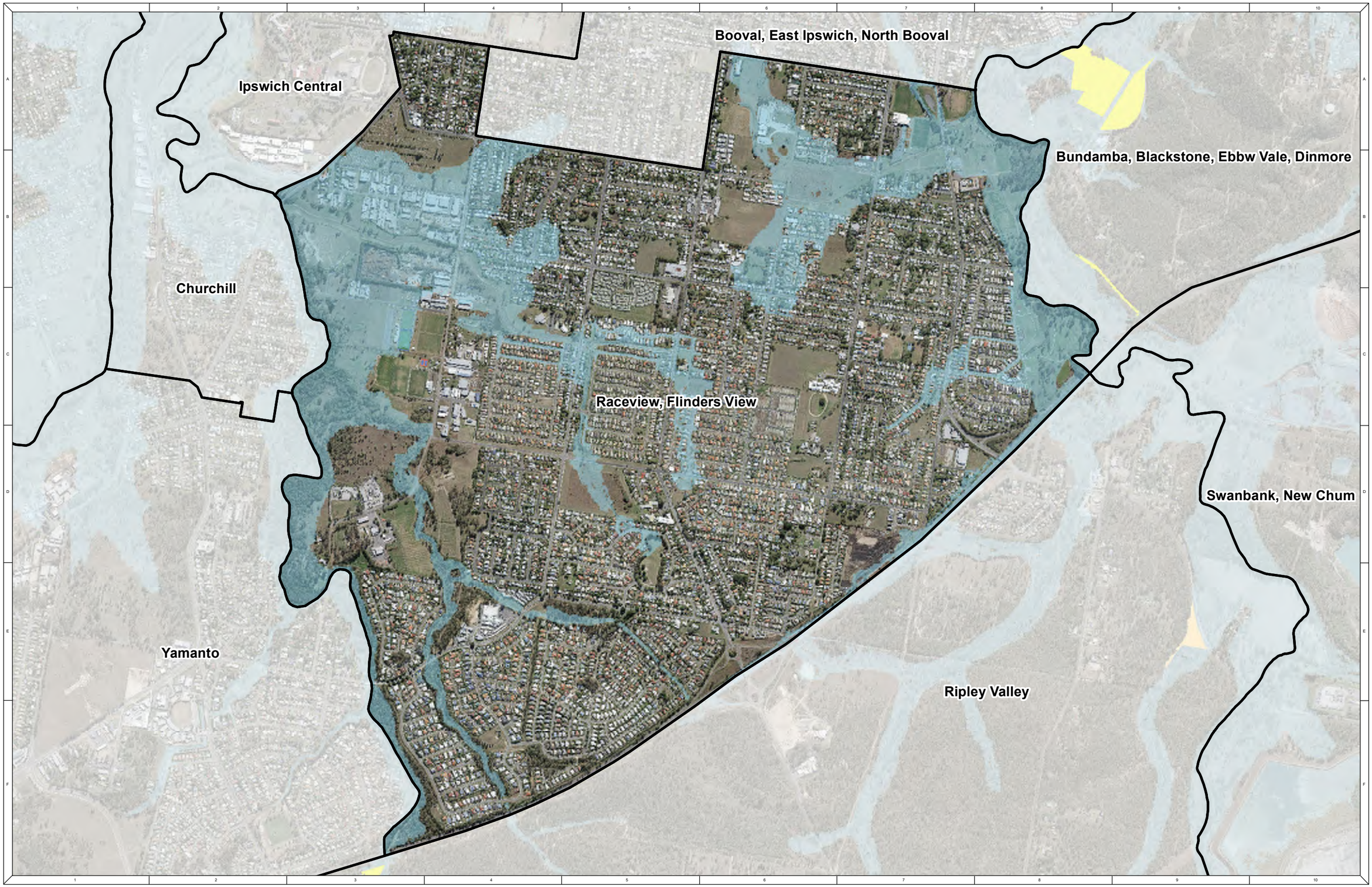
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Booval, East Ipswich, North Booval

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:17,320 at A3

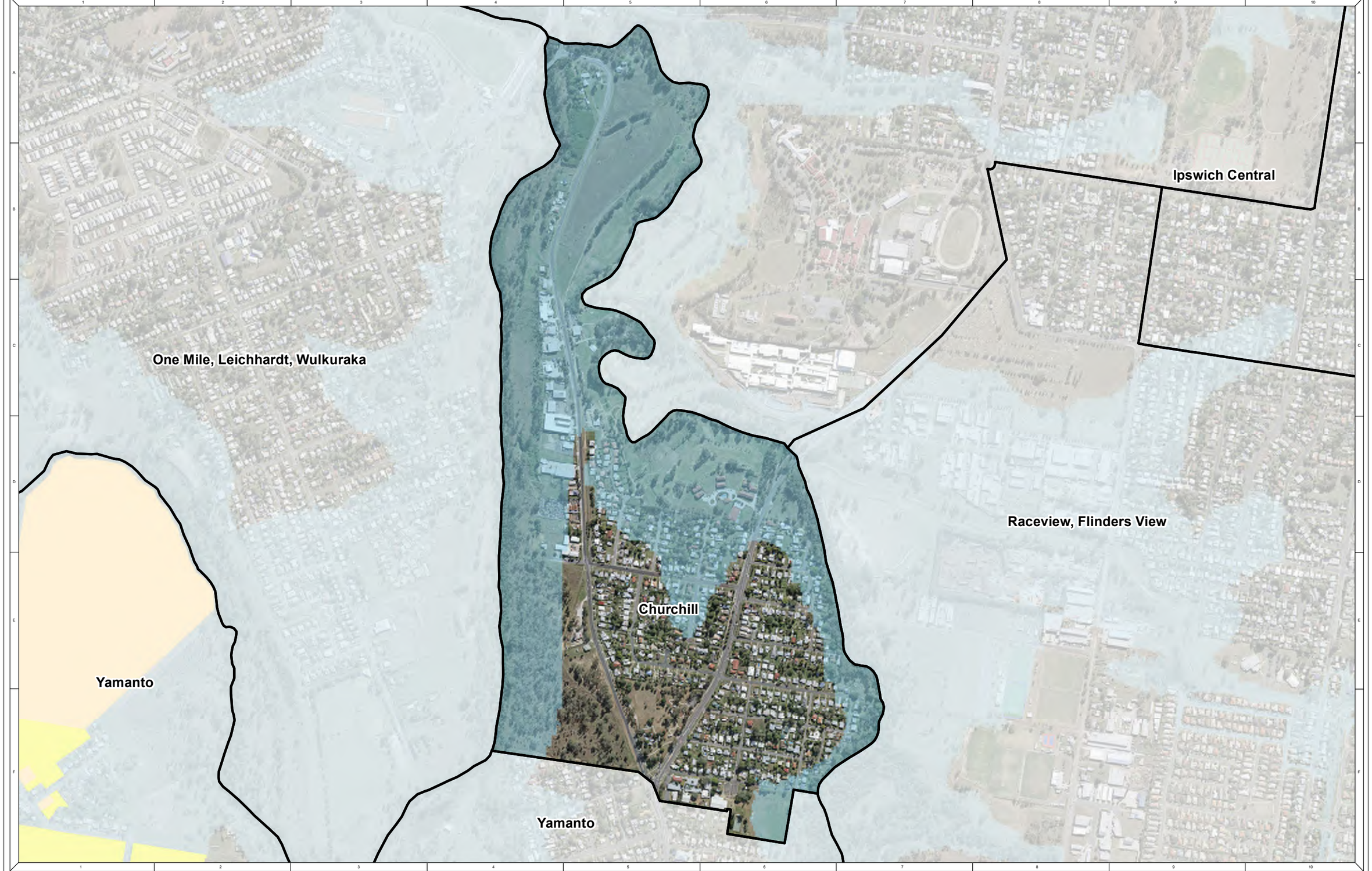
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Raceview, Flinders View

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:9,830 at A3

WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Churchill

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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One Mile, Leichhardt, Wulkuraka

Churchill

Amberley

Raceview, Flinders View

Yamanto

Purga (part), Goolman, Peak Crossing

Ripley Valley

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:14,960 at A3

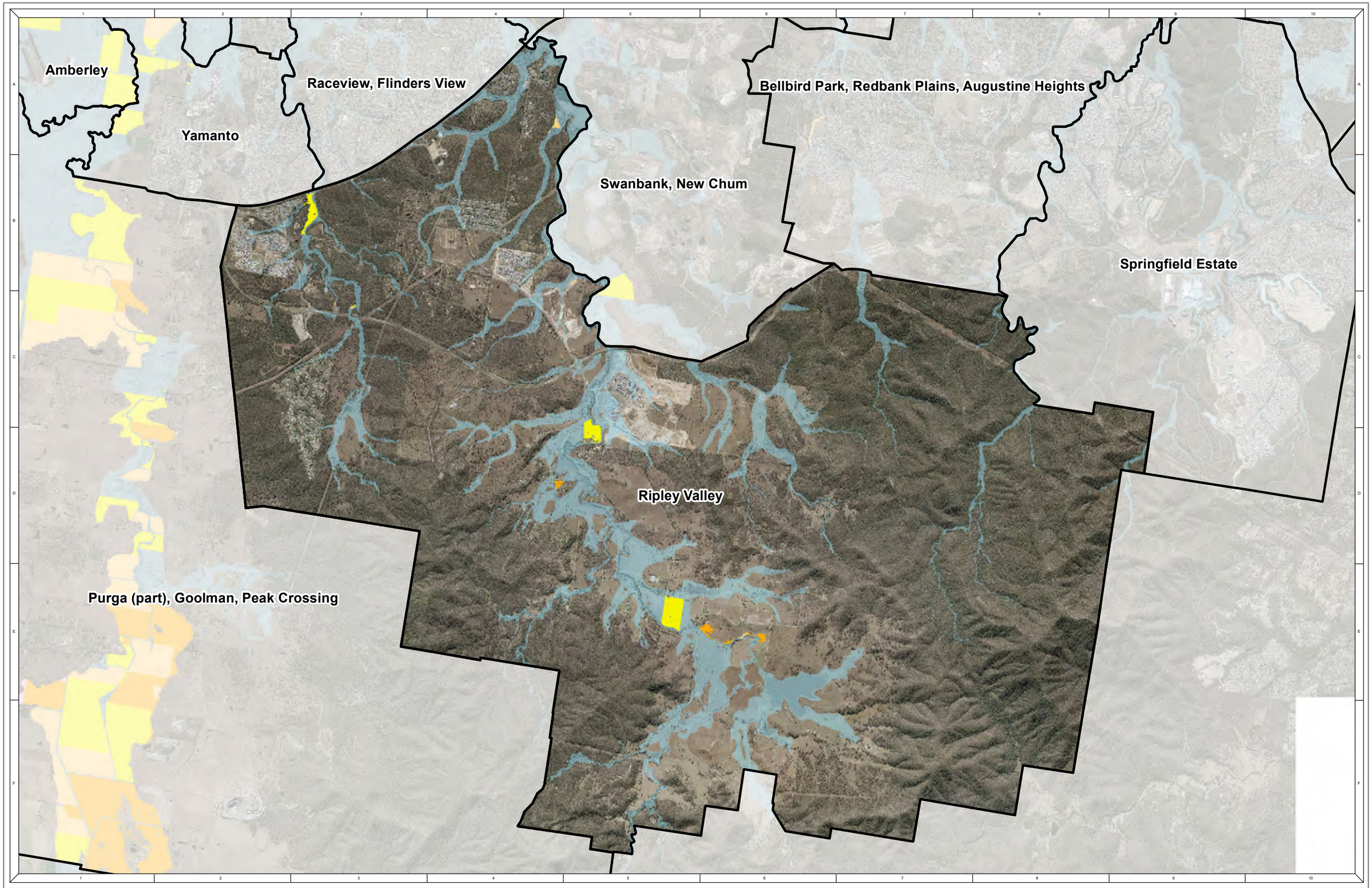
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Yamanto

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:57,120 at A3

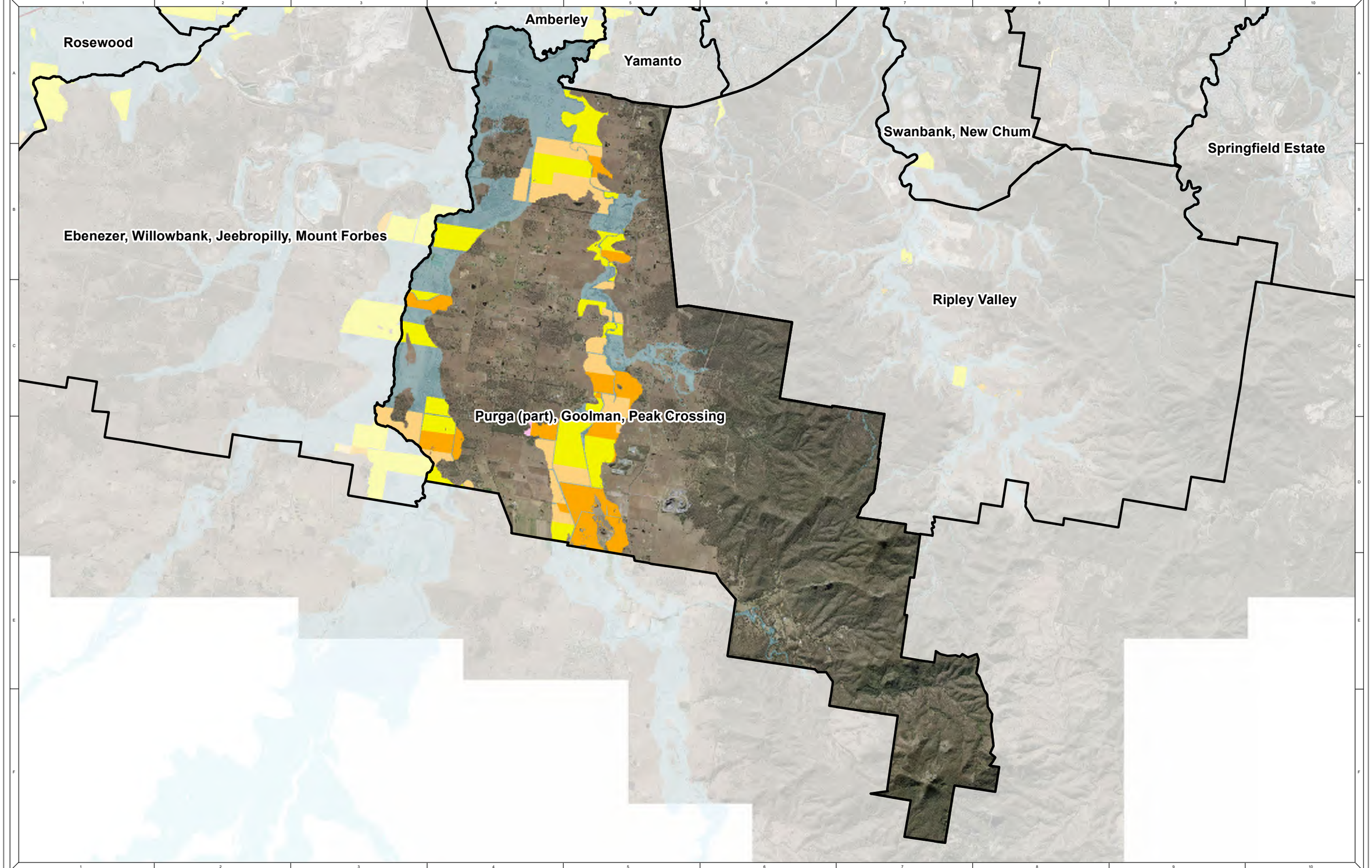
WATER TECHNOLOGY
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Ripley Valley

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:86,370 at A3

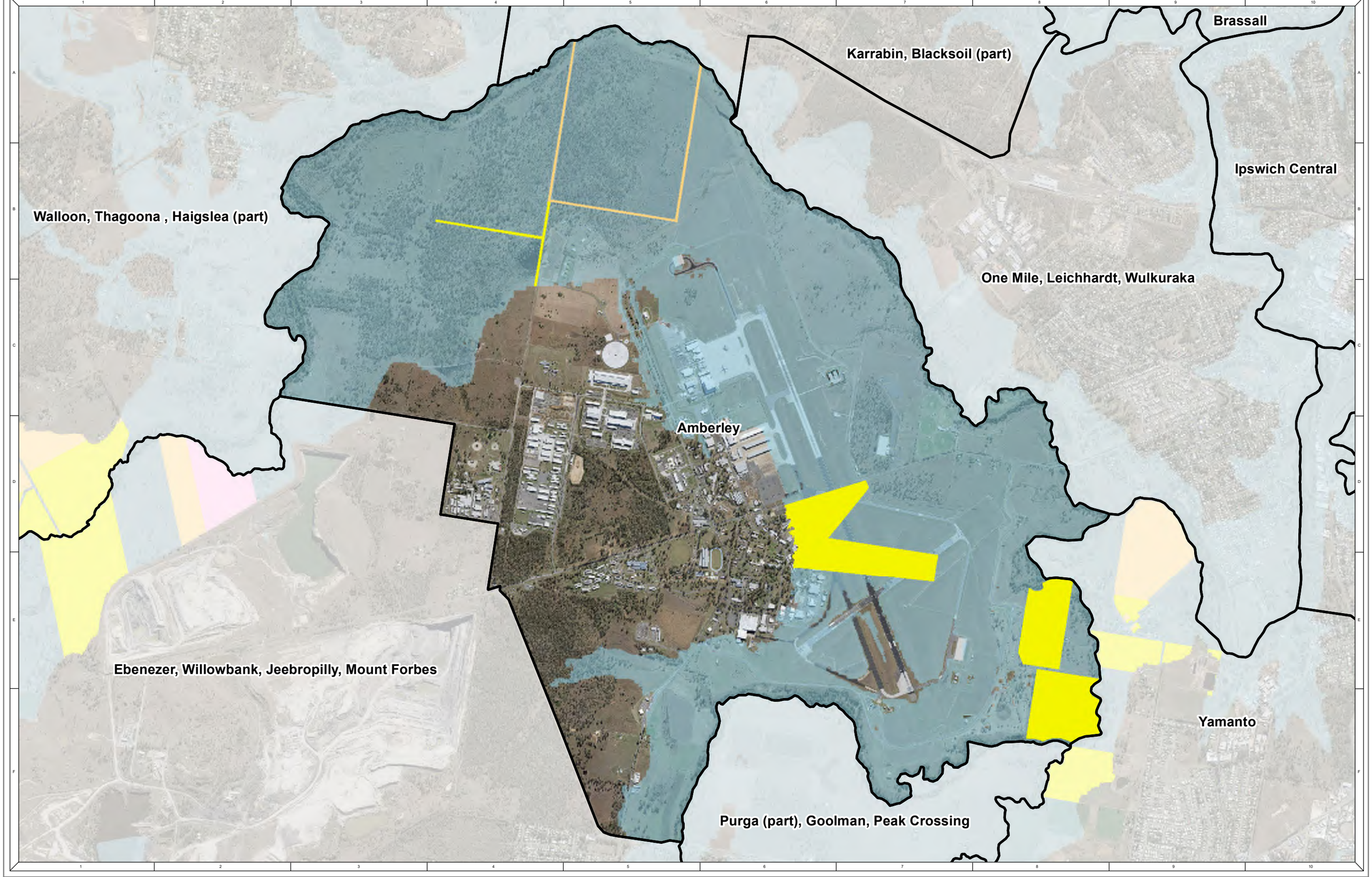
WATER TECHNOLOGY
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Purga (part), Goolman, Peak Crossing

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
W E
S

ARFL > 1% AEP+CC Flood Level

0 - 0.5m	1- 2.5	7.5 -10
0.5 -1	2.5 - 5	>10m
	5 - 7.5	1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:26,710 at A3

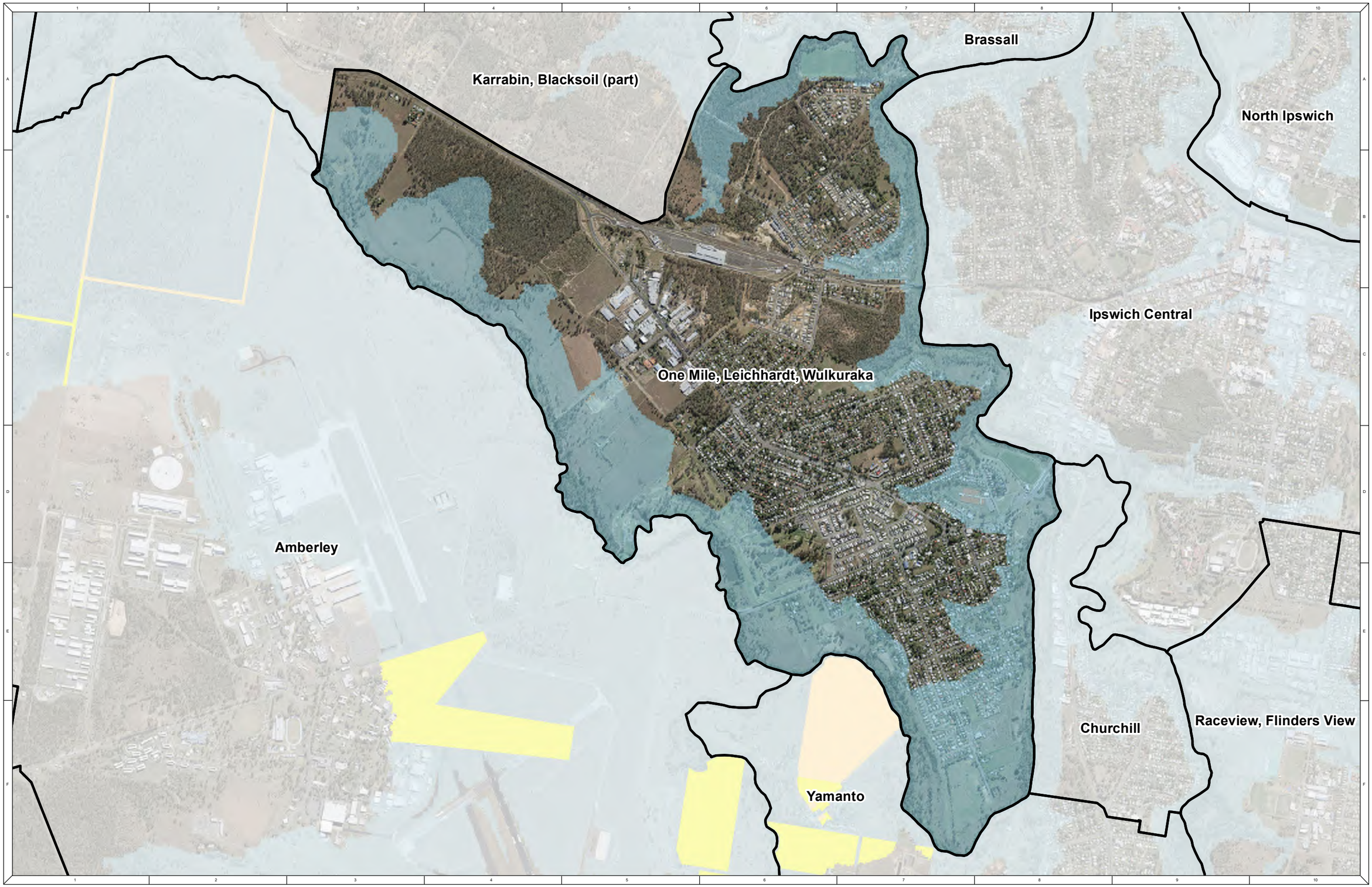
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Amberley

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:21,280 at A3

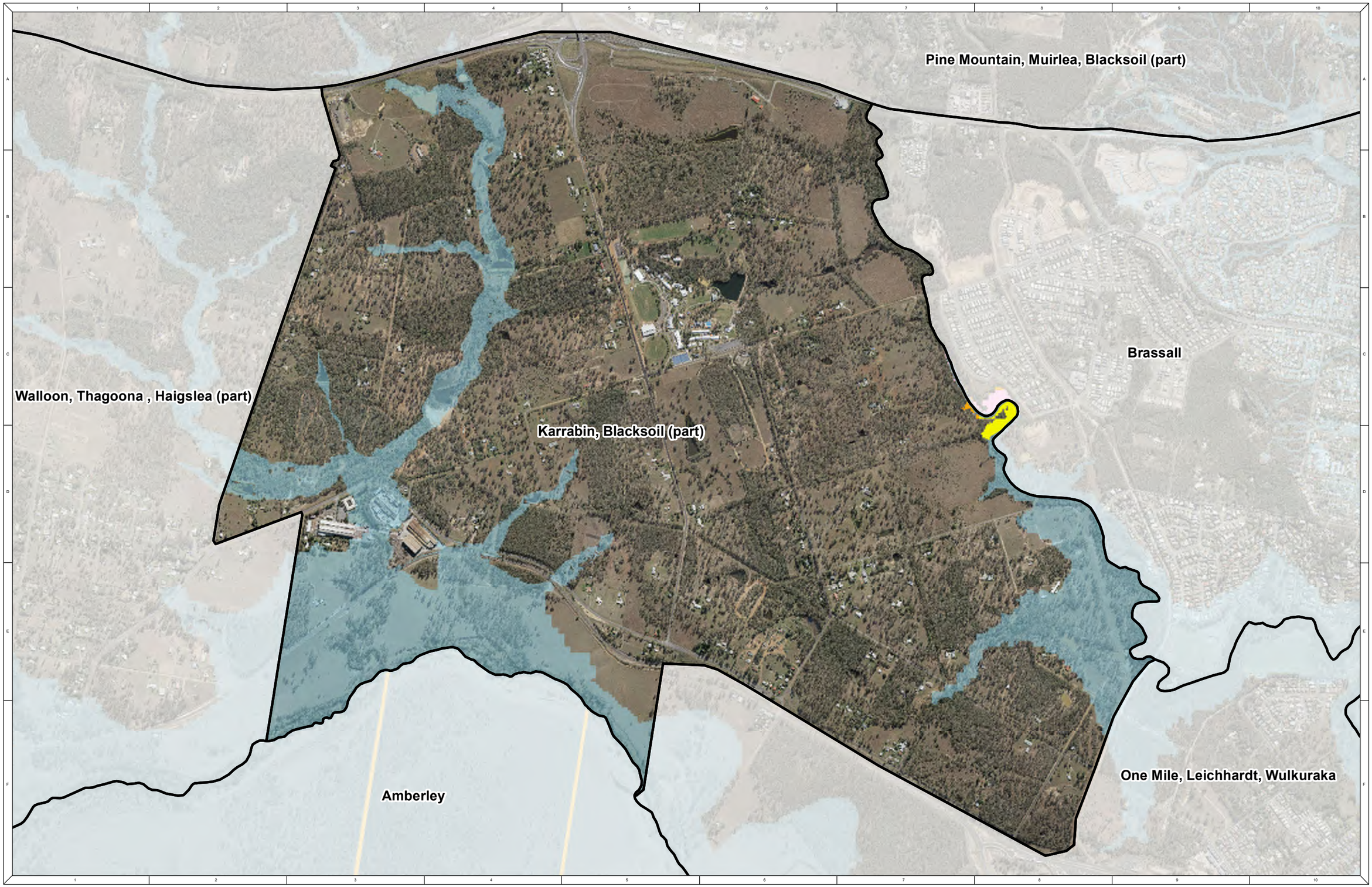
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : One Mile, Leichhardt, Wulkuraka

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N W E S

ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:17,050 at A3

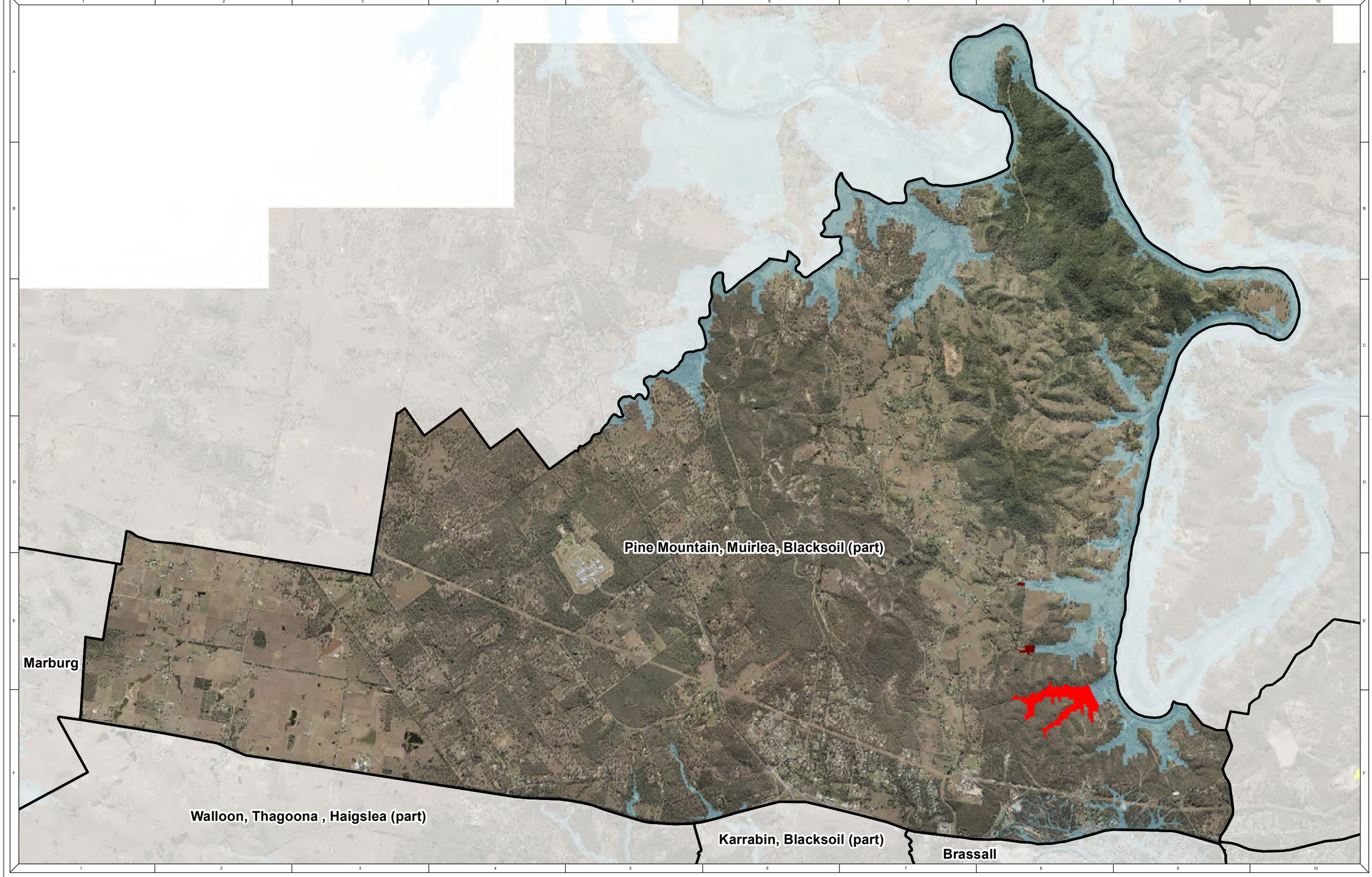
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Karrabin, Blacksoil (part)

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:43,740 at A3

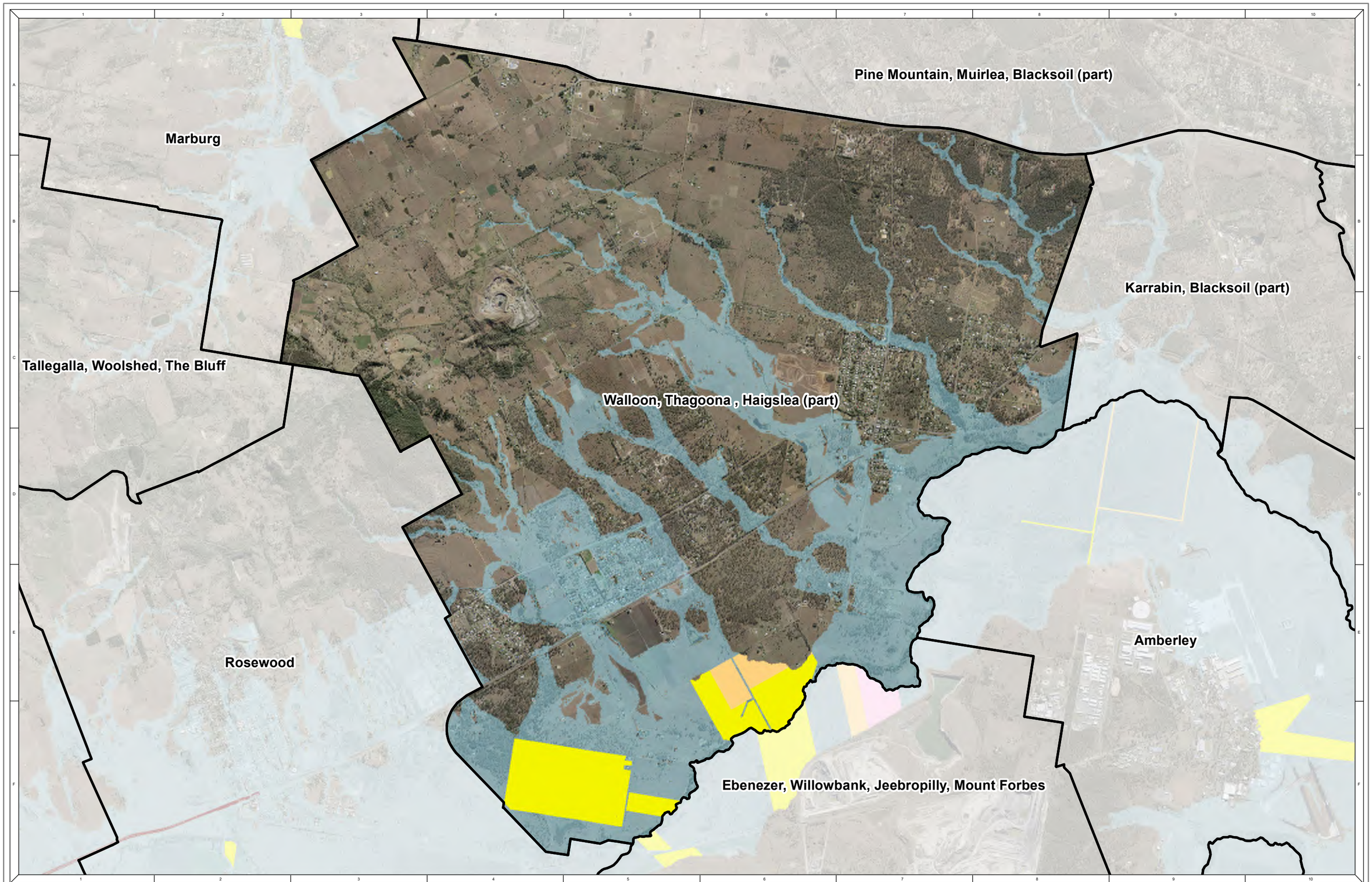
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Pine Mountain, Muirlea, Blacksoil (part)

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:40,030 at A3

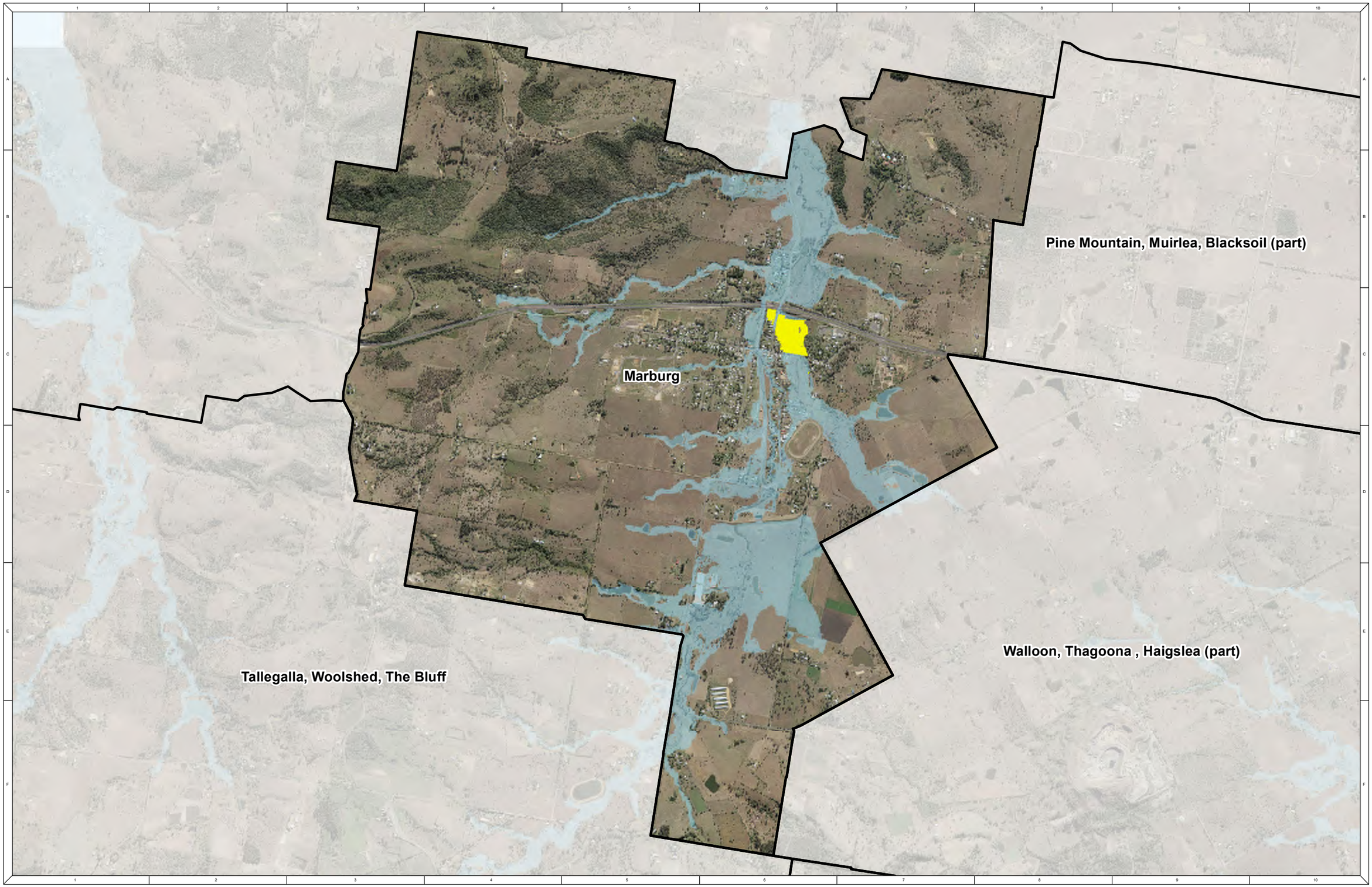
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Walloon, Thagoona , Haigslea (part)

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:26,140 at A3

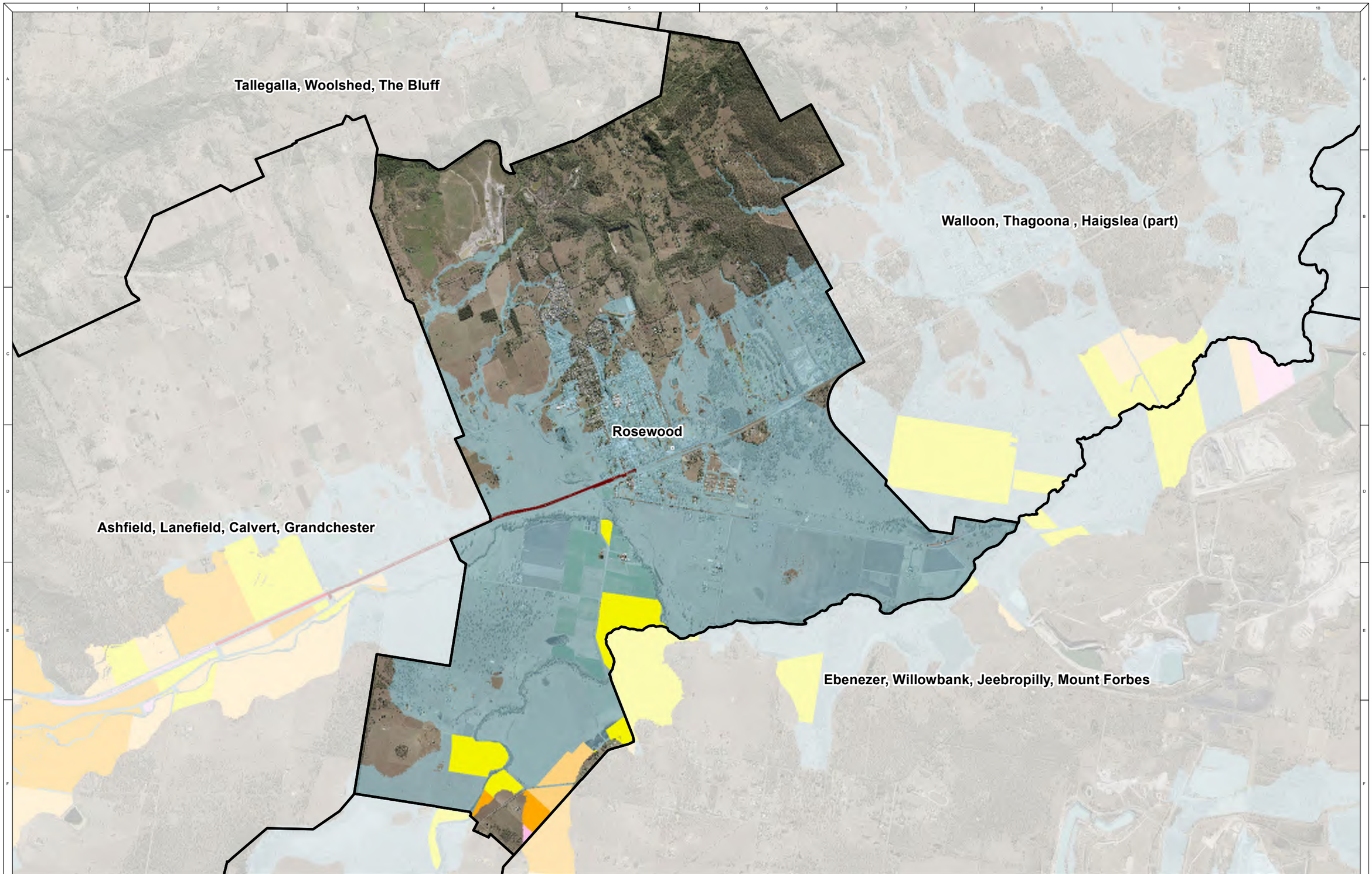
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Marburg

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:39,400 at A3

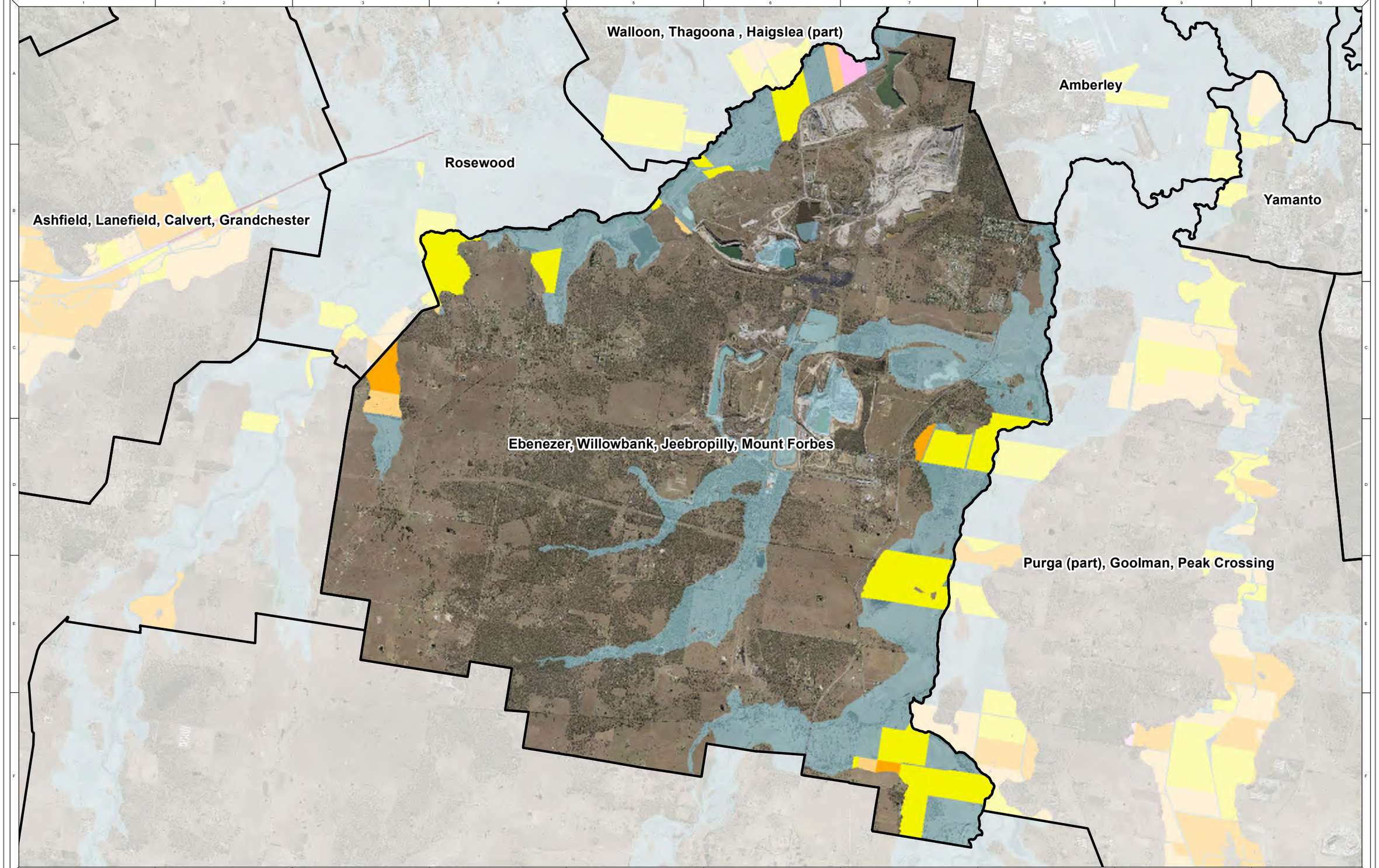
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Rosewood

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:60,540 at A3

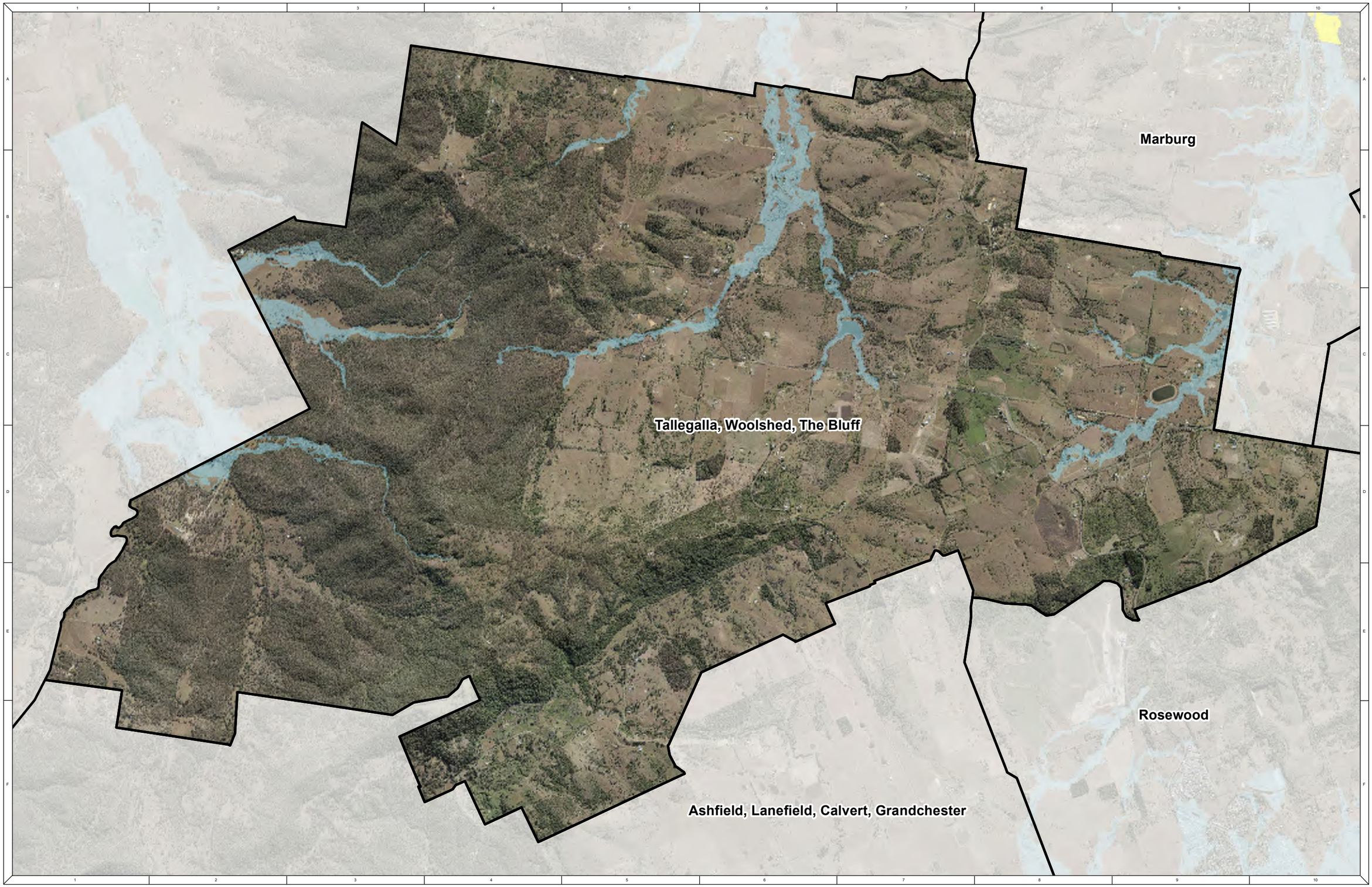
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Ebenezer, Willowbank, Jeebropilly, Mount Forbes

REFERENCE: M:\Temp\Ipswich\Ipswich_FloodHeightAssessment_Maps.mxd

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N
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ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:32,530 at A3

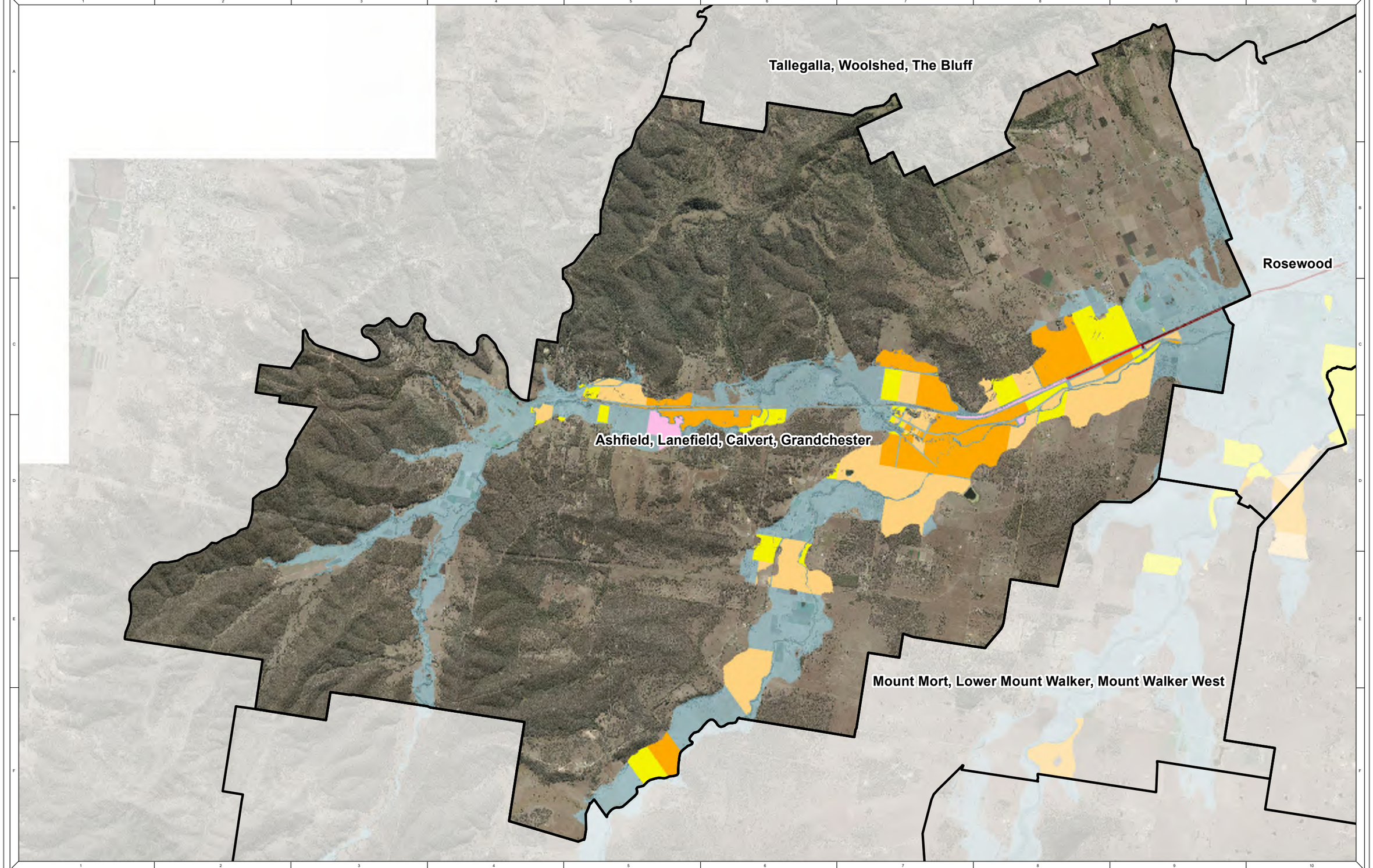
WATER TECHNOLOGY

Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Tallegalla, Woolshed, The Bluff

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N
W E
S

ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1 Kilometers

1:58,390 at A3

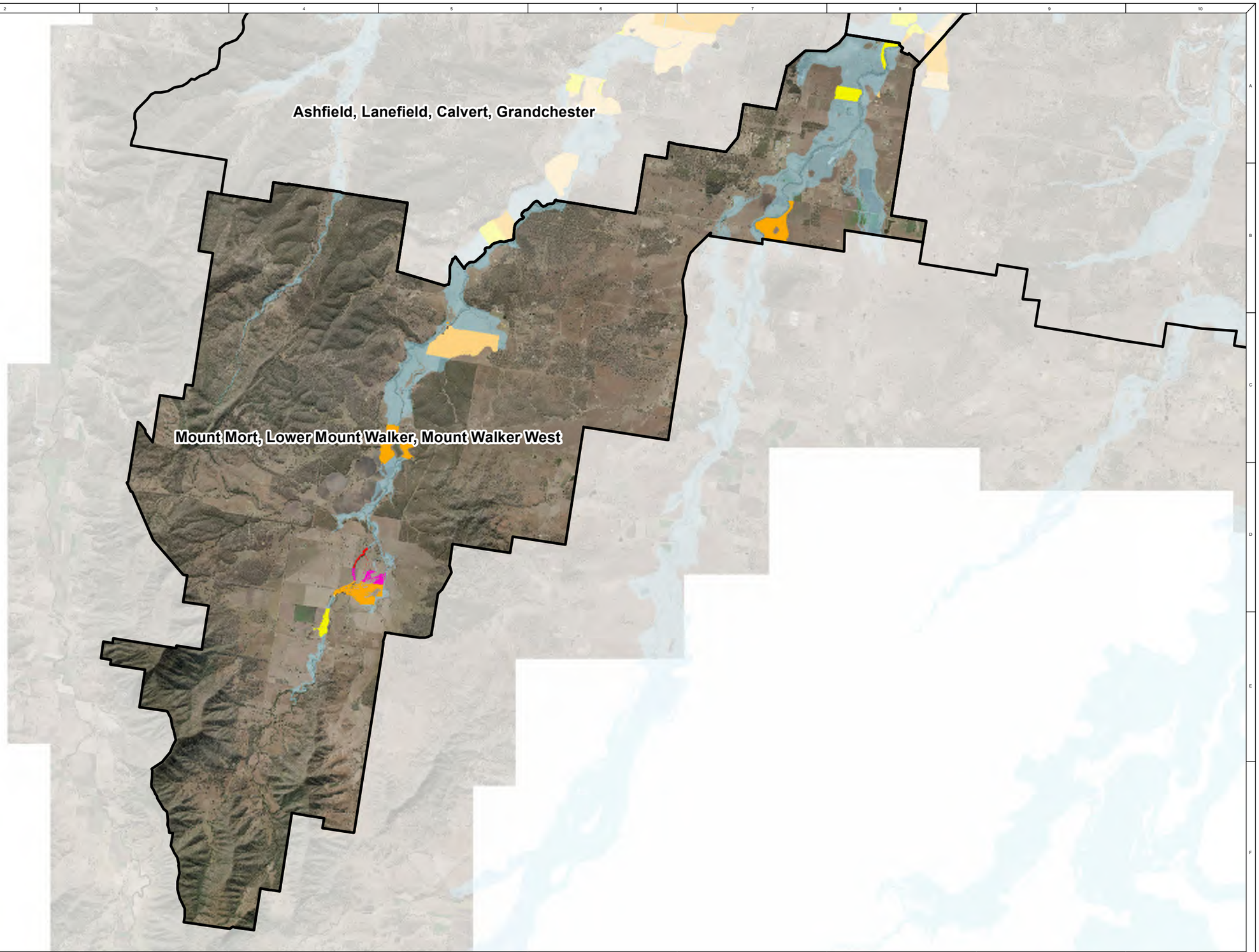
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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Ashfield, Lanefield, Calvert, Grandchester

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N
W E
S

ARFL > 1% AEP+CC Flood Level

- 0 - 0.5m
- 0.5 -1
- 1- 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 -10
- >10m
- 1% AEP+CC Flood Extent

0 0.5 1
Kilometers

1:92,550 at A3

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Ipswich Flood Height Assessment

AFRL > 1% AEP+CC : Mount Mort, Lower Mount Walker, Mount Walker West

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