NARROMINE SHIRE COUNCIL

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

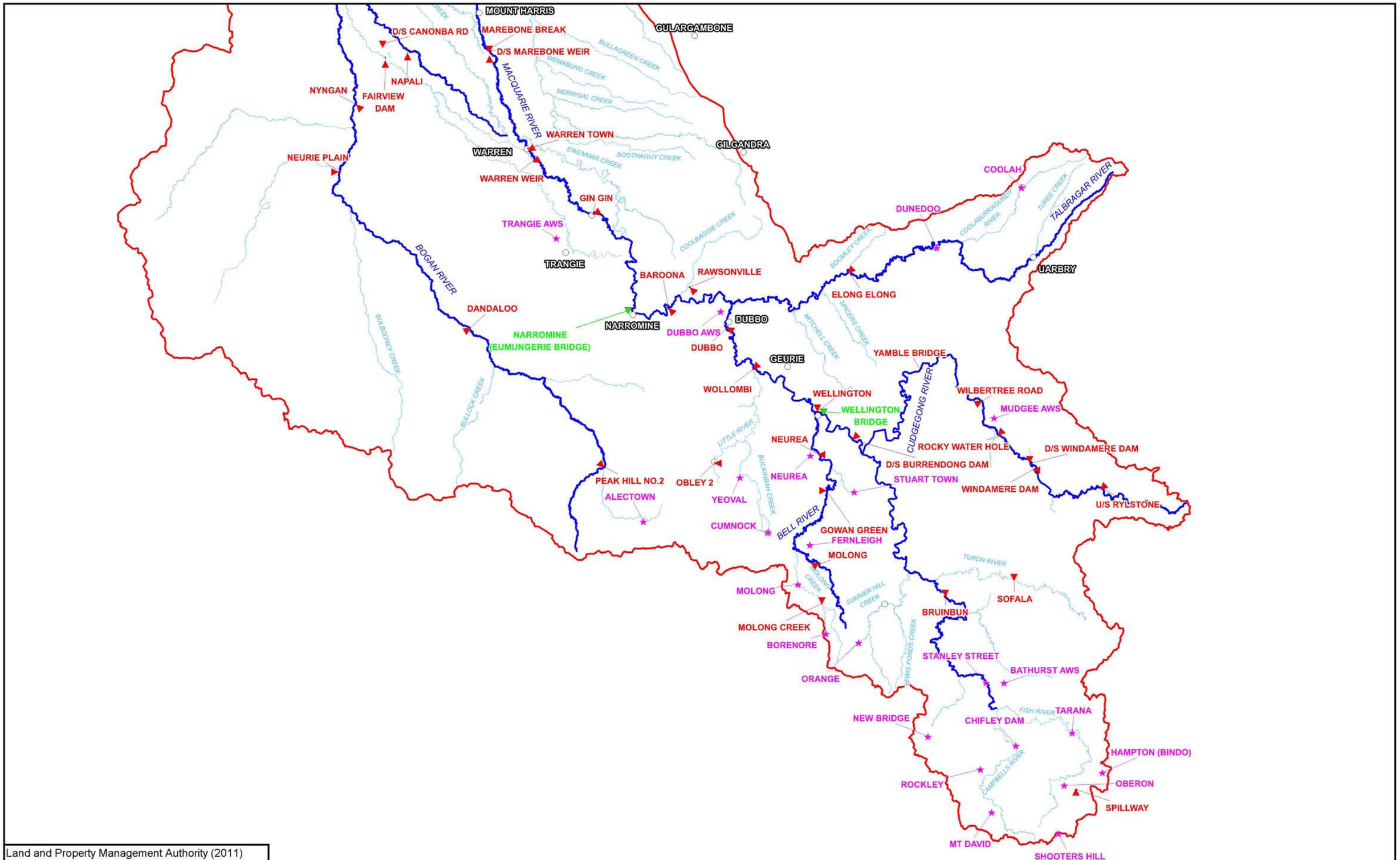
JULY 2021

VOLUME 2 – FIGURES

Job No: AT477 File: NTFRMSPU_V2_Figures_[Rev 1.6].docx	Date: July 2021 Rev No: 1.6	Principal: SAB Author: SAB

Narromine Shire Council
120 Dandaloo Street, Narromine
mail@narromine.nsw.gov.au
(02) 6889 9999

LIST OF FIGURES



N

12.5 0 12.5 25 37.5 km

Scale: 1:1,250,000

Lyall & Associates

LEGEND

- Rain Gauge (Telemetered)
- Stream Gauge (Telemetered)
- Stream Gauge (Manual)
- Town Location

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 1.1

LOCATION AND VALLEY-WIDE CATCHMENT PLAN

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

LEGEND

- Stream Gauge
- Town Levee
- Weir

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.1
Sheet (1 of 2)

EXISTING DRAINAGE SYSTEM AT NARROMINE

MITCHELL HIGHWAY
NARROMINE GOLF COURSE
MACQUARIE RIVER
CULLING STREET
TOWN COWAL
SIXTH AVENUE
FIFTH AVENUE NORTH
THIRD AVENUE NORTH
DANDALOO STREET
MERLEA STREET
NYMAGEE STREET
MERINGO STREET
MERYULA STREET
ALGALAH STREET
MANILDRA STREET
CROSSLEY DRIVE
DANDALOO ROAD
BURRAWAY STREET
DERRIBONG STREET
OLD BACKWATER ROAD
BACKWATER ROAD
FIFTH AVENUE SOUTH
THIRD AVENUE SOUTH
MERRUBA STREET
TEMON STREET
MERYULA STREET
ALGALAH STREET
MANILDRA STREET
MURGAH STREET
BOOTH STREET
TERANGION STREET
NARROMINE ROAD
MAIN WESTERN RAILWAY
MINORE STREET
CATHUNDRIL STREET
WEBBS SIDING ROAD
MOSS AVENUE
NELLIE VALE ROAD
DAPPO ROAD
PARKES NARROMINE RAILWAY
WRIGHT ROAD
WINGFIELD ROAD
THE McGRANE WAY
TOWN COMMON
TOMINGLEY RD
ABECKETT STREET
MORGAN STREET

N
120 0 120 240 360 m
Scale: 1:12,000

LEGEND

- Inlet Pit
- Junction Pit
- Headwall
- Pipe < 450 mm Diameter
- Pipe ≥ 450 mm Diameter
- Box Culvert
- Town Levee

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.1
Sheet (2 of 2)

EXISTING DRAINAGE SYSTEM AT NARROMINE

N	250 0 250 500 750 m Scale: 1:25,000

Lyall & Associates

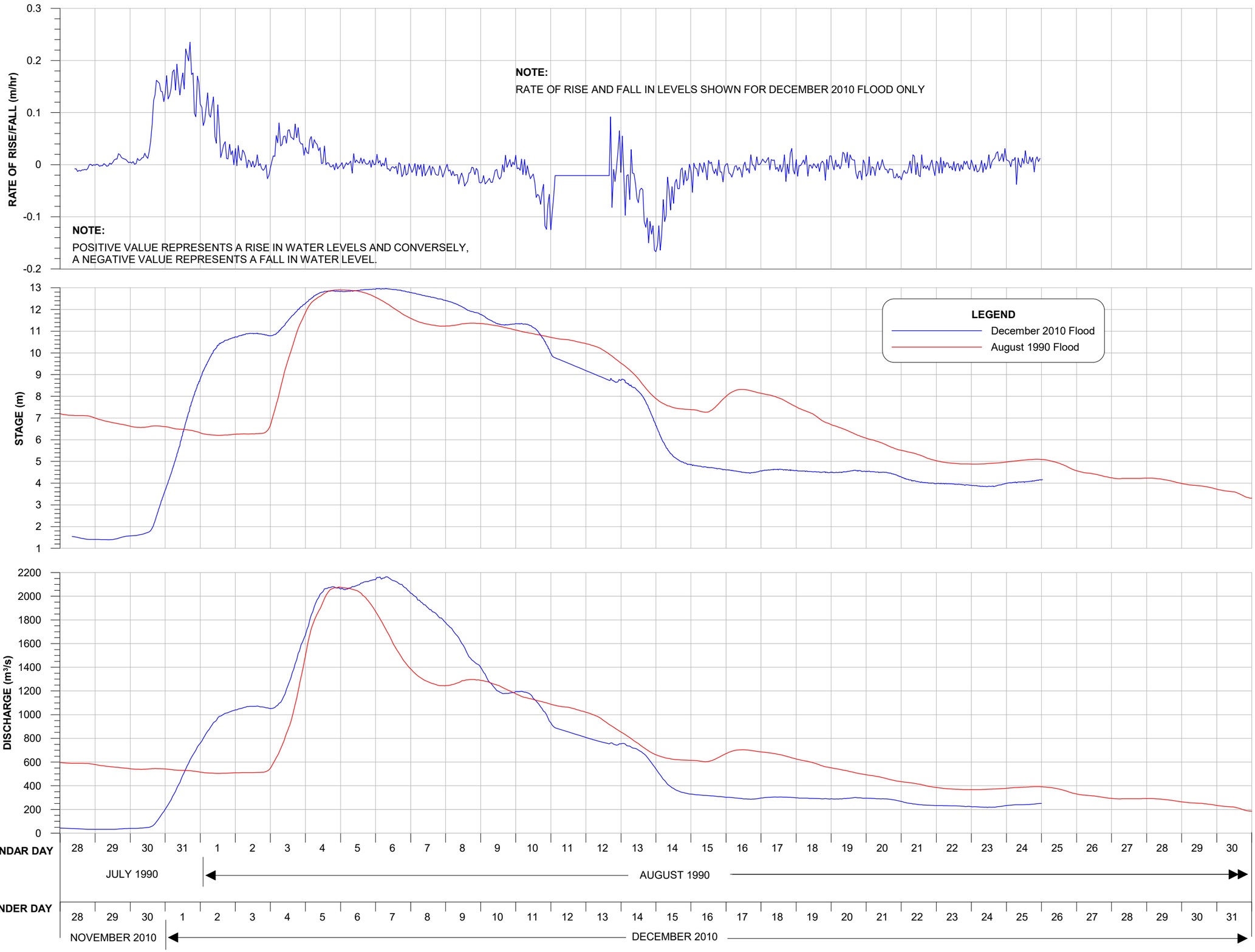
LEGEND

- Alignment of LiDAR Survey Data Levels Along Southern Bank of Macquarie River
- Alignment of LiDAR Survey Data Levels Along Mitchell Highway
- Alignment of LiDAR Survey Data Levels Along Main Western Railway
- 238.27 Surveyed December 2010 Flood Mark (m AHD)
- Stream Gauge

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.2

AERIAL PHOTOGRAPH SHOWING HISTORIC FLOODING AT NARROMINE
DECEMBER 2010 FLOOD



NOTE : TIME ZERO ON CALENDAR DAY AXIS = 0000 HOURS ON 28 JULY 1990
0000 HOURS ON 28 NOVEMBER 2010

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.3

STREAM GAUGE DATA
MACQUARIE RIVER AT BAROONA STREAM GAUGE (GS 421127)

REFER SHEET 2

WEIR GAUGE

BRIDGE GAUGE

TOWN GAUGE

NARROMINE AERODROME

SKY PARK

NARROMINE GOLF CLUB

NARROMINE SHOWGROUNDS

WEBBS SIDING

MACQUARIE RIVER

COWAL

BACKWATER

TOWN COWAL

MAIN WESTERN RAILWAY

MITCHELL HWY

NARROMINE-GUNUNGBERIE RAIL RD

PARKES NARROMINE RAILWAY

798 2746 774 237 237.5 238 584 236.5 239 239.5 240 240.5 241 241.5 242 242.5 243 243.5 244 5600 4117 116 471 237 818 237.5 238.5 226 239 239.5 884 240 240.5 242.5 937 243 FM_1955.35 FM_1955.31 FM_1955.36

Indicative Depth of Inundation (m)

	< 0.10
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.40
	0.40 to 0.60
	0.60 to 0.80
	0.80 to 1.00
	1.00 to 1.50
	1.50 to 2.00
	2.00 to 2.50
	2.50 to 3.00
	> 3.00

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m^3/s)
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)
- FM_1955.15 Historical Flood Mark and Identifier (Source of Flood Marks: Bewsher, 1998)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.4
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
FEBRUARY 1955 FLOOD

Indicative Depth of Inundation (m)

- < 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- 0.50 to 0.60
- 0.60 to 0.70
- 0.70 to 0.80
- 0.80 to 0.90
- 0.90 to 1.00
- > 1.00
- Flow Direction Arrow

WEIR GAUGE
MACQUARIE RIVER
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
TOWN
COWAL
MACQUARIE RIVER
MAIN WESTERN RAILWAY
NARROMINE EUMUNGERIE RAIL RD
BURRAWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
DANDALOO RD
CULLING ST
NYMAGEE ST
BURRAWAY ST
DERRIBONG ST
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
TERANGION ST
CATHUNDRIL ST
MINORE ST
WEBBS SIDING RD
MOSS AVE
NELLIE VALE RD
DAPPO RD
DAPPO ROAD
MERINGO ST
CROSSLEY DR
RIVER DR
HIGH PARK RD
WRIGHT RD
PARKES
WINGFIELD R
THE MOGRANE WAY
237
237.5
238
238.5
238.6
239
239.5
240
240.5
241
241.5
242
242.5
243

N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

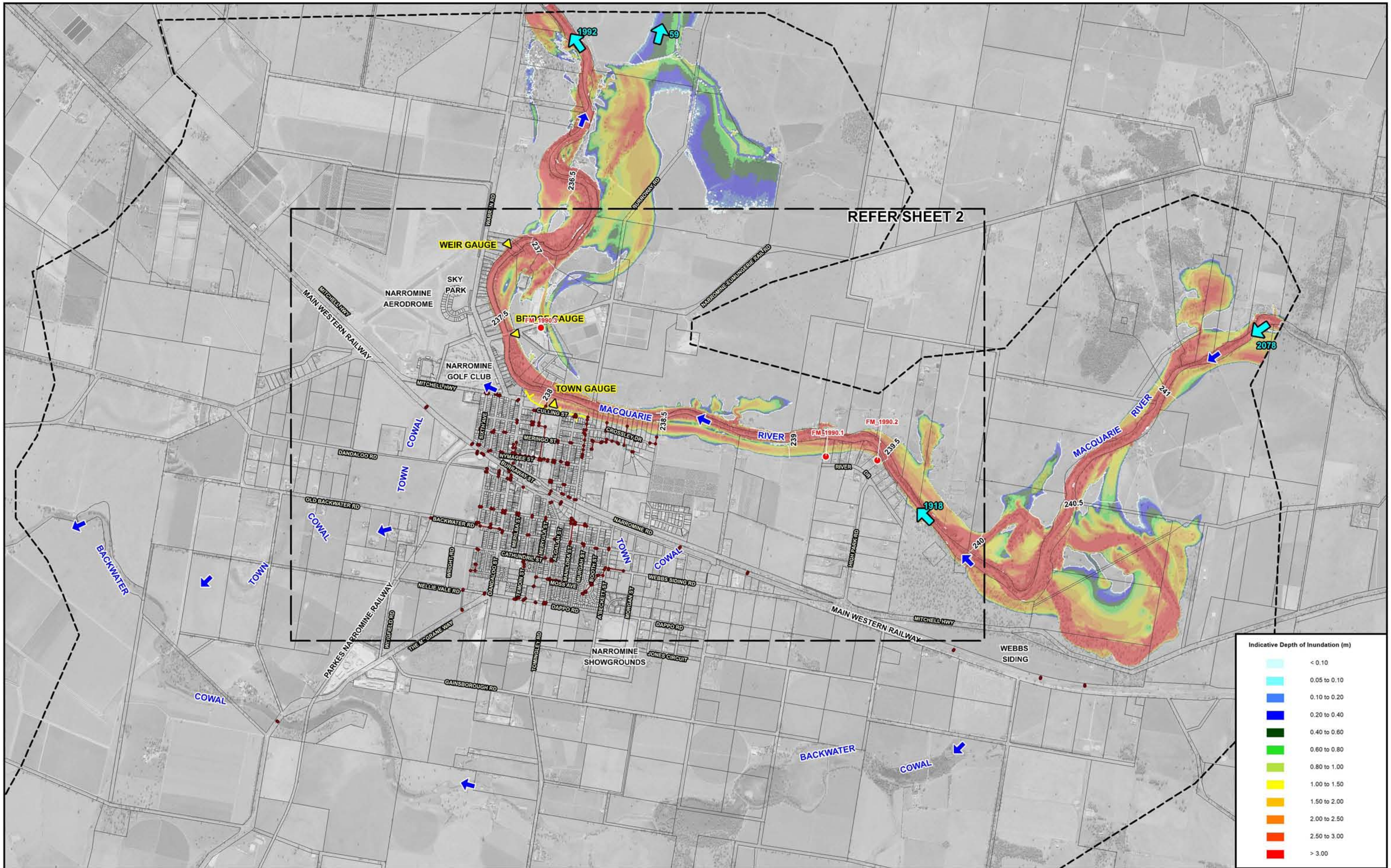
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD) — 238.5
- Historical Flood Mark and Identifier (Source of Flood Marks: Bewsher, 1998) — FM_1955.15

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.4
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
FEBRUARY 1955 FLOOD



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

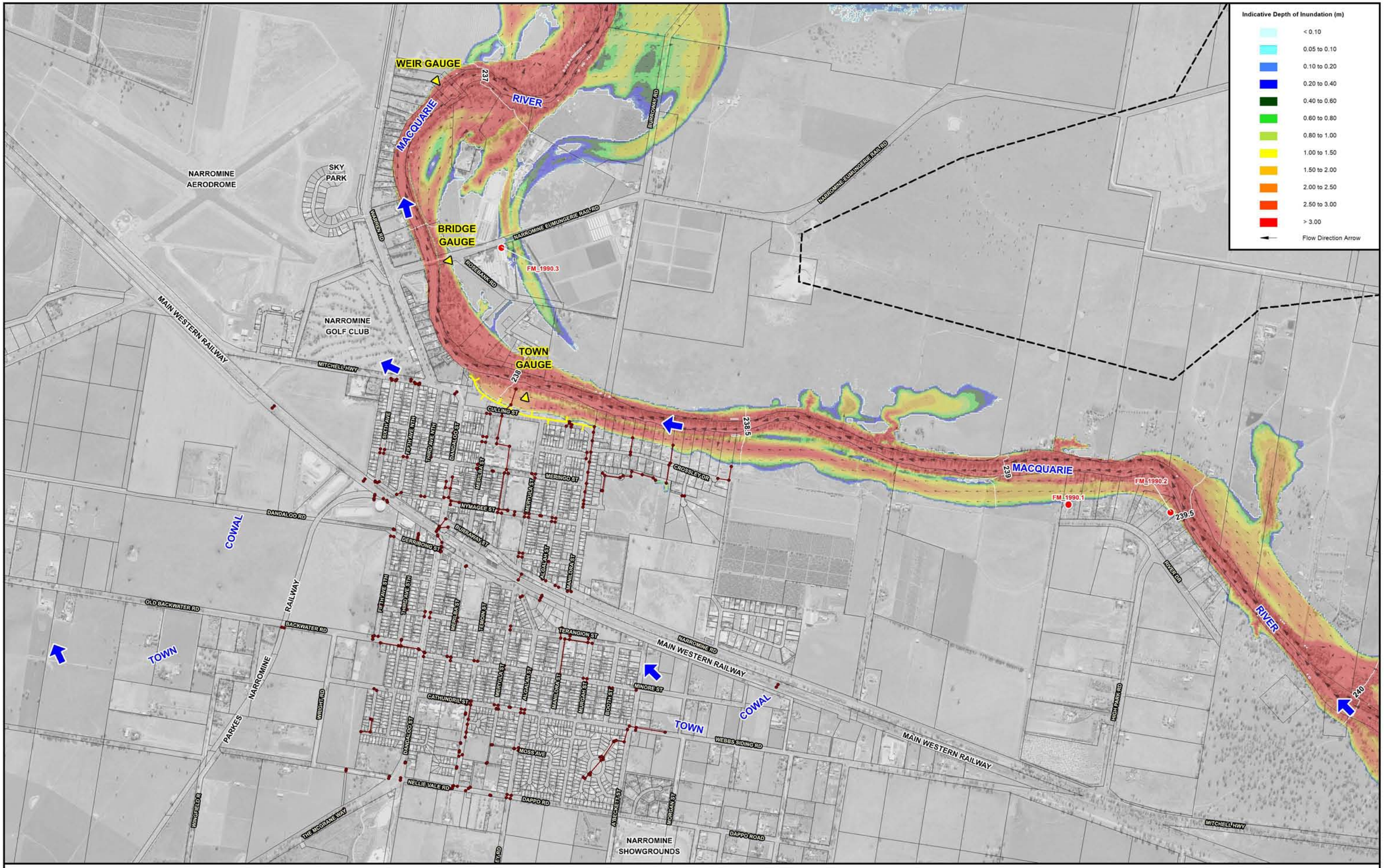
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m³/s)
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)
- FM_1990.1 Historical Flood Mark and Identifier (Source of Flood Marks: Bewsher, 1998)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.5
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
AUGUST 1990 FLOOD



NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

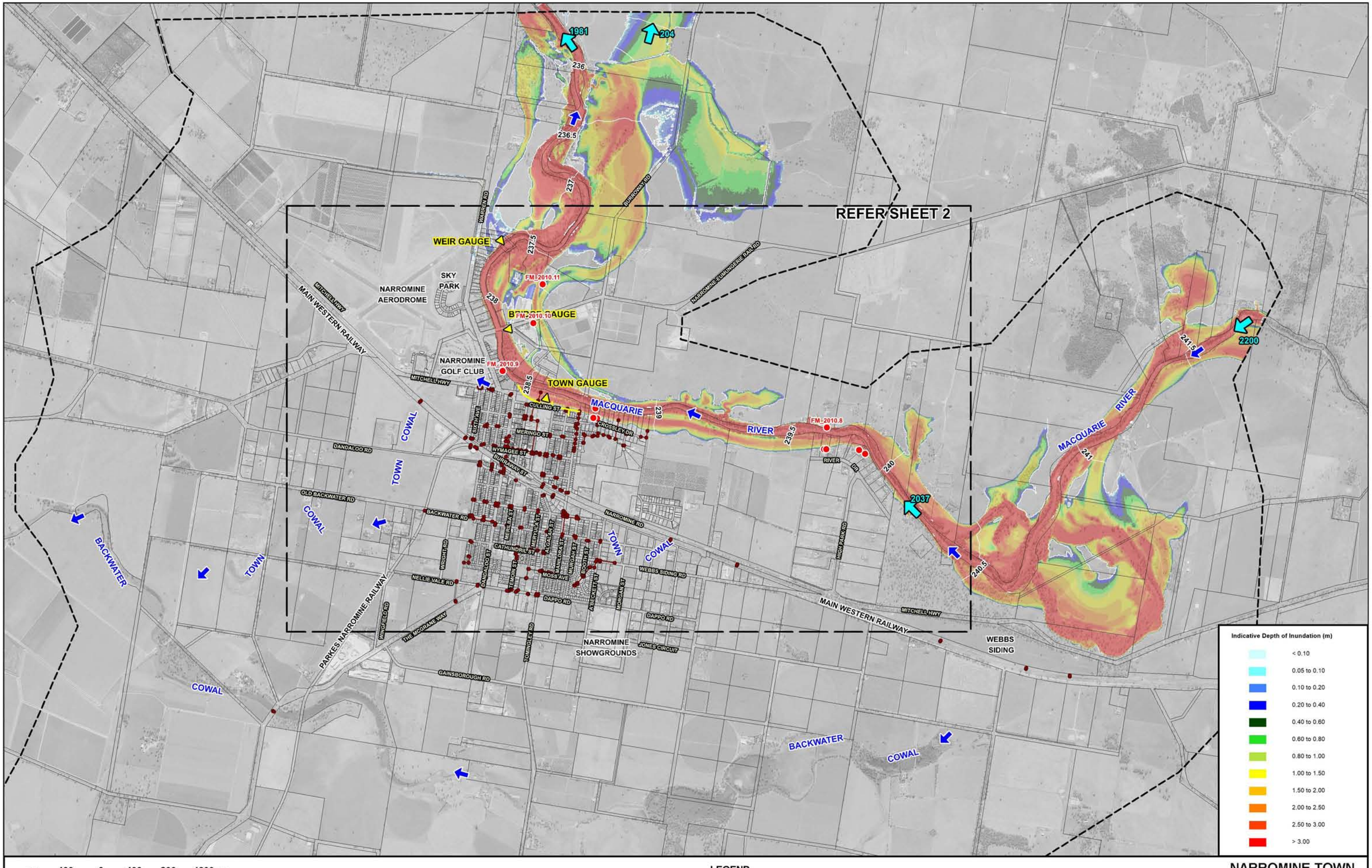
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.5
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
AUGUST 1990 FLOOD



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Peak Overland Flow(m^3/s) (5600)
- Town Levee
- Water Surface Elevation Contour (m AHD) (238.5)
- Historical Flood Mark and Identifier (Source of Flood Marks: NSW SES) (FM_2010.5)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.6
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
DECEMBER 2010 FLOOD

Indicative Depth of Inundation (m)

- < 0.10
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.40
- 0.40 to 0.60
- 0.60 to 0.80
- 0.80 to 1.00
- 1.00 to 1.50
- 1.50 to 2.00
- 2.00 to 2.50
- 2.50 to 3.00
- > 3.00
- Flow Direction Arrow

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
237.5
238
238.5
239
239.5
240
MACQUARIE RIVER
FM_2010.1
FM_2010.2
FM_2010.3
FM_2010.4
FM_2010.5
FM_2010.6
FM_2010.7
FM_2010.8
FM_2010.9
FM_2010.10
FM_2010.11
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
MAIN WESTERN RAILWAY
NARROMINE EUMUNGERIE RAIL RD
BURROWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
COWAL
TOWN
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERILBA ST
MERYULA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DERRIBONG ST
ALGALAH ST
MANILDRA ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
RAILWAY
FIFTH AVE STH
THIRD AVE STH
TEMOR ST
TERANGION ST
NARROMINE RD
MURGAH ST
BOOTH ST
MINORE ST
CATHUNDRIL ST
WRIGHT RD
PARKES
WINGFIELD R
MOSS AVE
NELLIE VALE RD
DAPPO RD
THE McGRANE WAY
ABBECKETT ST
MORGAN ST
WEBBS SIDING RD
DAPPO ROAD
HIGH PARK RD
RIVER DR

N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

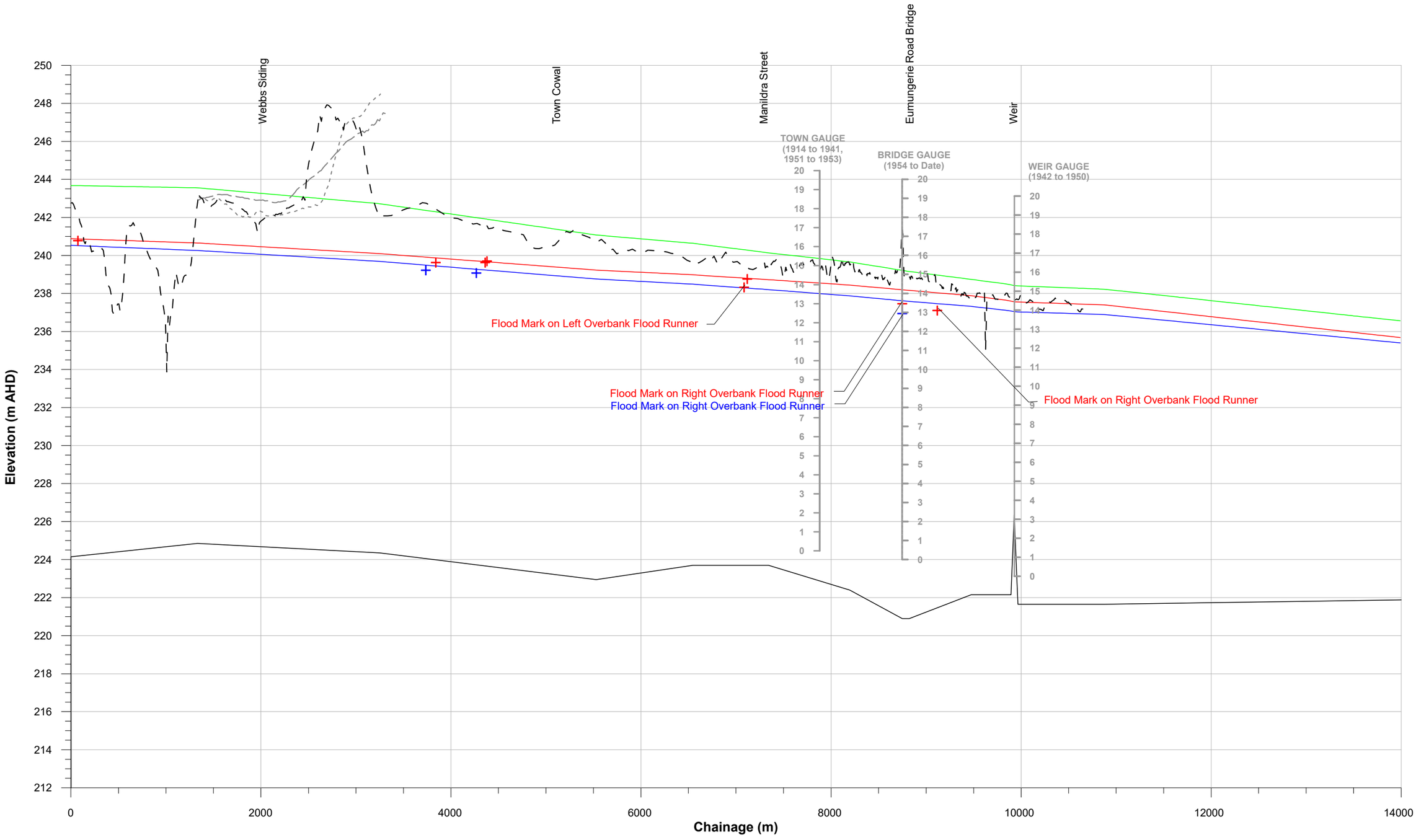
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD) — 238.5
- Historical Flood Mark and Identifier (Source of Flood Marks: NSW SES) — FM_2010.5

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.6
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
DECEMBER 2010 FLOOD



LEGEND

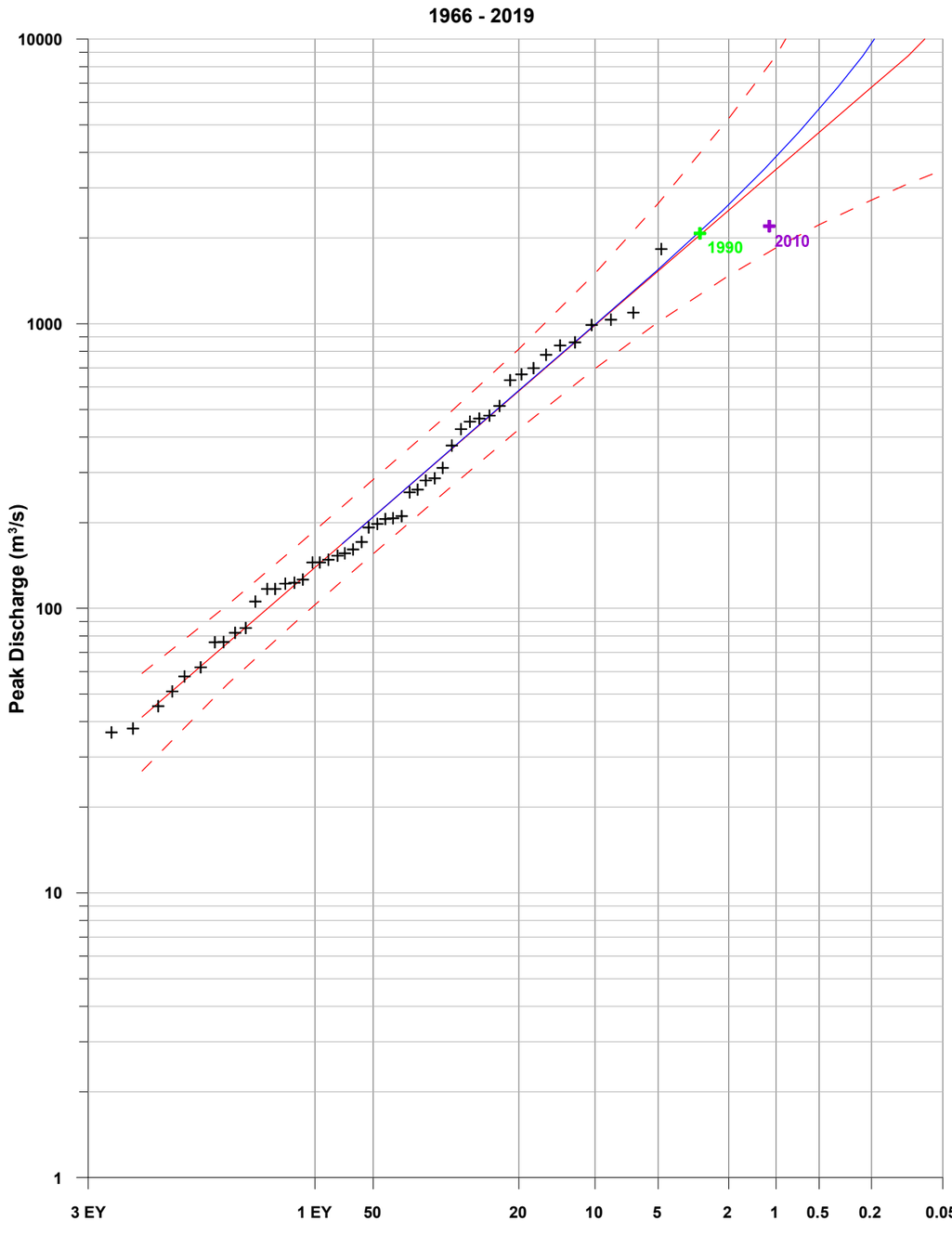
- February 1955 Flood (TUFLOW Model)
- December 2010 Flood (TUFLOW Model)
- August 1990 Flood (TUFLOW Model)
- December 2010 Flood Mark (Source: SES)
- August 1990 Flood Mark (Source: Bewsher, 1998)
- Channel Invert
- LiDAR Survey Data Levels along Southern Bank of Macquarie River
- LiDAR Survey Data Levels along Mitchell Highway
- LiDAR Survey Data Levels along Main Western Railway

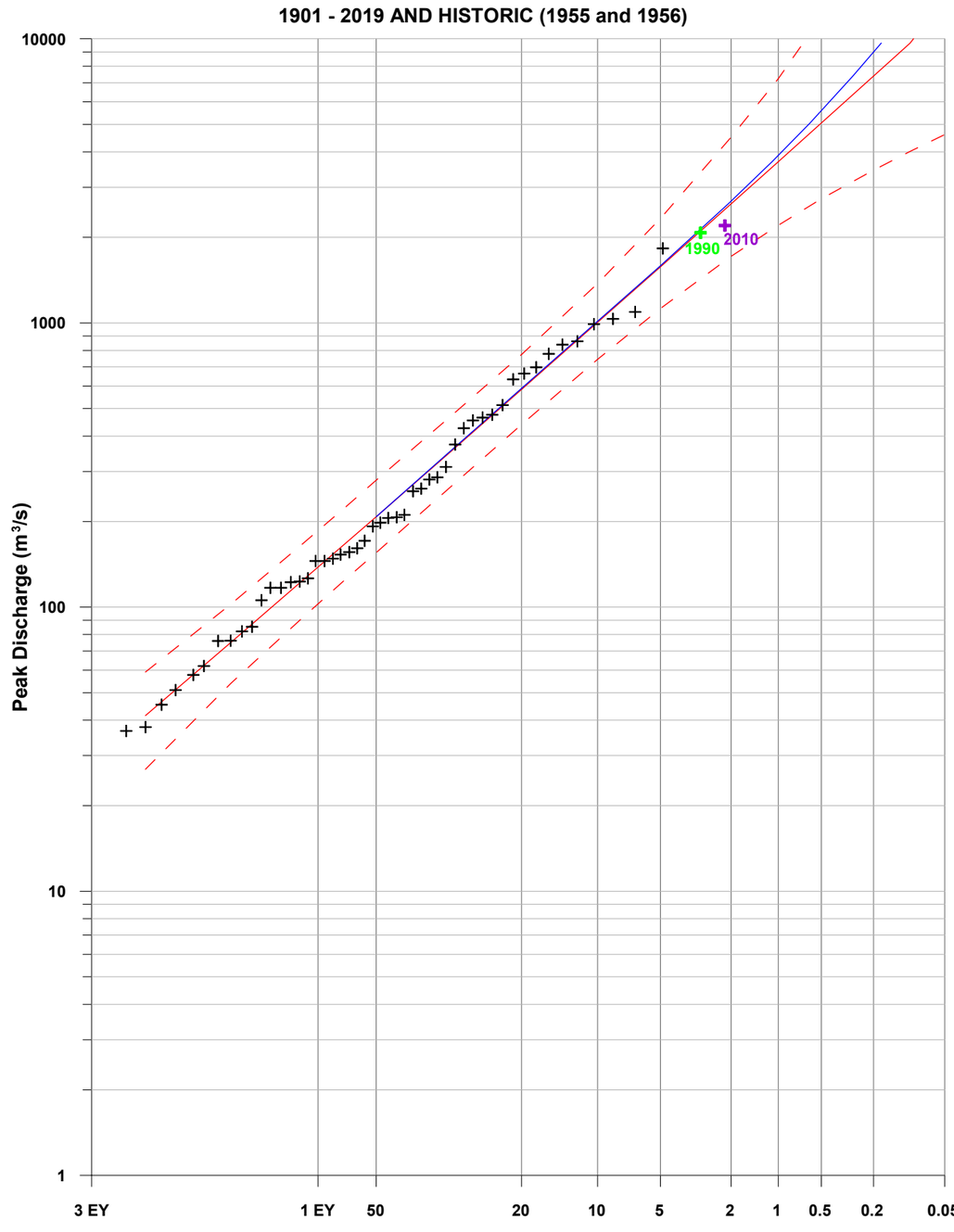
Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.7

HISTORIC WATER SURFACE PROFILES
MACQUARIE RIVER





LEGEND

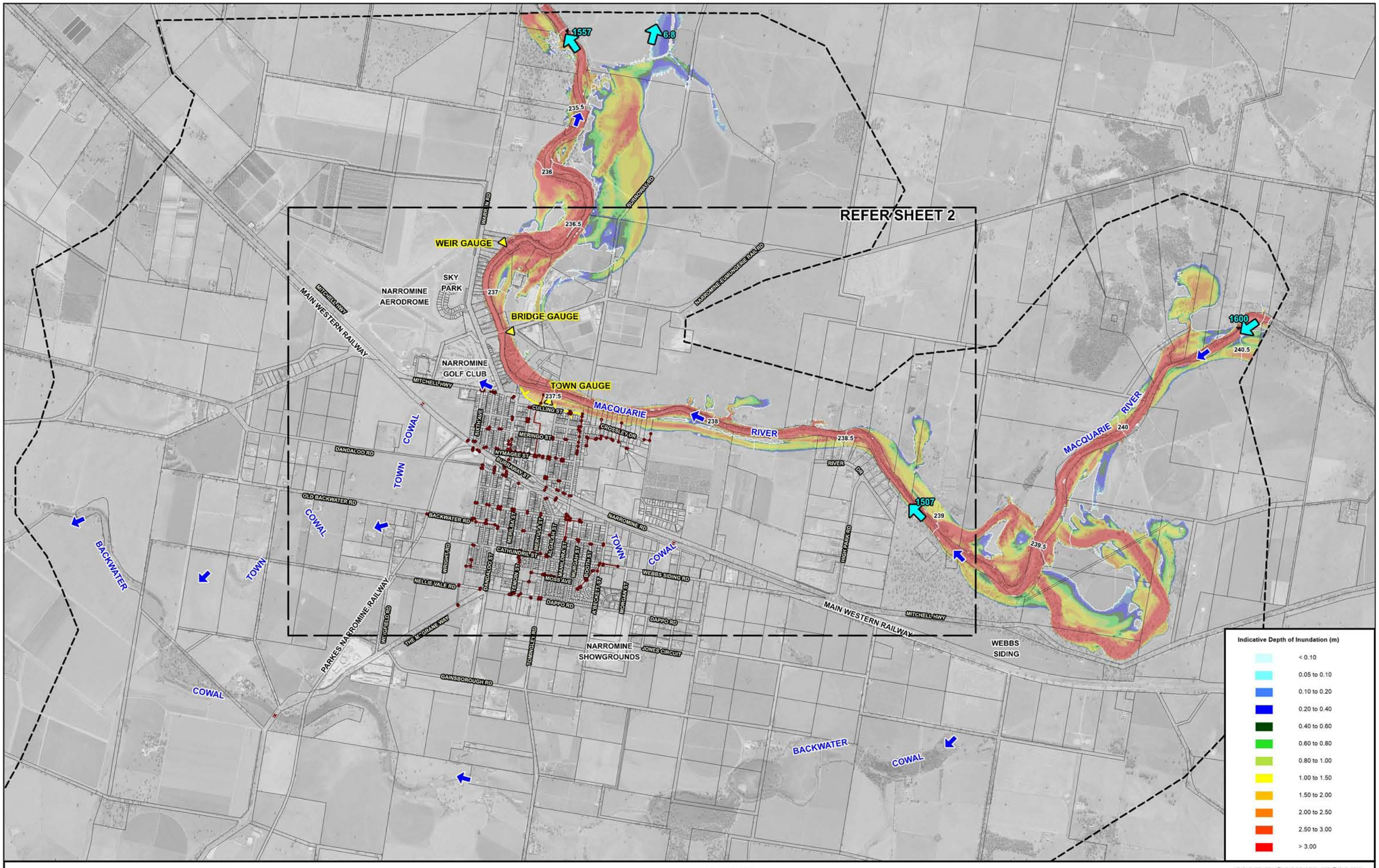
- Expected Probability Adjustment
- Log-Pearson III 5% Confidence Limits
- Log-Pearson III Fit
- \+ Recorded Annual Maximum Discharge

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.8

UPDATED FLOOD FREQUENCY ANALYSIS
MACQUARIE RIVER AT BAROONA STREAM GAUGE (GS 421127)



Indicative Depth of Inundation (m)

< 0.10
0.05 to 0.10
0.10 to 0.20
0.20 to 0.40
0.40 to 0.60
0.60 to 0.80
0.80 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
2.50 to 3.00
> 3.00

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m^3/s)
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)

NARROMINE TOWN

FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.9
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
5% AEP

Indicative Depth of Inundation (m)

- < 0.10
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.40
- 0.40 to 0.60
- 0.60 to 0.80
- 0.80 to 1.00
- 1.00 to 1.50
- 1.50 to 2.00
- 2.00 to 2.50
- 2.50 to 3.00
- > 3.00
- Flow Direction Arrow

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
MACQUARIE RIVER
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
TOWN
COWAL
MAIN WESTERN RAILWAY
NARROMINE EUMUNGERIE RAIL RD
BURRAWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERRILDA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
MERKULA ST
DANDALOO RD
DERRIBONG ST
ALGALAH ST
MANILDRA ST
FIFTH AVE STH
THIRD AVE STH
TEMORA ST
TERANGION ST
NARROMINE RD
OLD BACKWATER RD
BACKWATER RD
RAILWAY
NARROMINE
WRIGHT RD
PARKES
CATHUNDRIL ST
MURGAN ST
BOOTH ST
MINORE ST
WEBBS SIDING RD
MOSS AVE
NELLIE VALE RD
DAPPO RD
WINGFIELD R
THE MOGRANE WAY
A'BECKETT ST
MORGAN ST
DAPPO ROAD
RIVER DR
HIGH PARK RD
MITCHELL HWY
236.5
237
237.5
238
238.5
239

N
200 0 200 400 600 m
Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

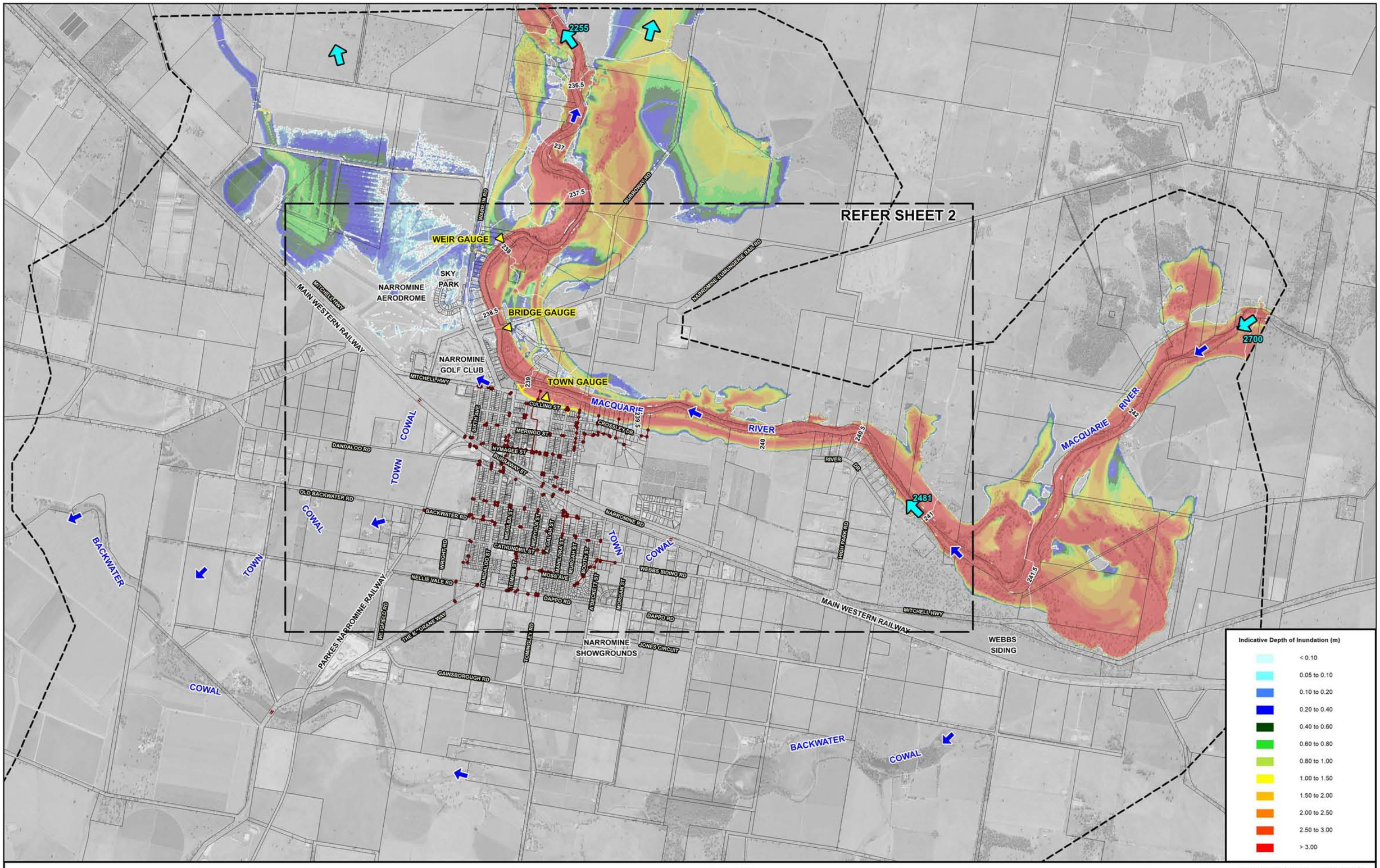
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD) (238.5)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.9
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
5% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m^3/s)
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.10
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
2% AEP

Indicative Depth of Inundation (m)

- < 0.10
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.40
- 0.40 to 0.60
- 0.60 to 0.80
- 0.80 to 1.00
- 1.00 to 1.50
- 1.50 to 2.00
- 2.00 to 2.50
- 2.50 to 3.00
- > 3.00
- Flow Direction Arrow

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
MACQUARIE RIVER
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
MAIN WESTERN RAILWAY
NARROMINE-EUMUNGERIE RAIL RD
BURRAWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
CULLING ST
DANDALOO RD
COWAL RAILWAY
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
WEBBS SIDING RD
DAPPO RD
DAPPO ROAD
NELLIE VALE RD
THE McGRANE WAY
WINGFIELD R
PARKES
WRIGHT RD
RIVER DR
HIGH YARRA RD
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERRIEA ST
MERIVILLA ST
MERINGO ST
NYMAGEE ST
DERRIBONG ST
ALGALAH ST
MANILDRA ST
FIFTH AVE STH
THIRD AVE STH
TEMORA ST
TERANGION ST
HERVILLA ST
CATHUNDRIL ST
LUPGAN ST
BOOTH ST
MINORE ST
MOSS AVE
ABERCRAIL ST
MORGAN ST
CROSSLEY DR
237.5
238
238.5
239
239.5
240
240.5
241

N
200 0 200 400 600 m
Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

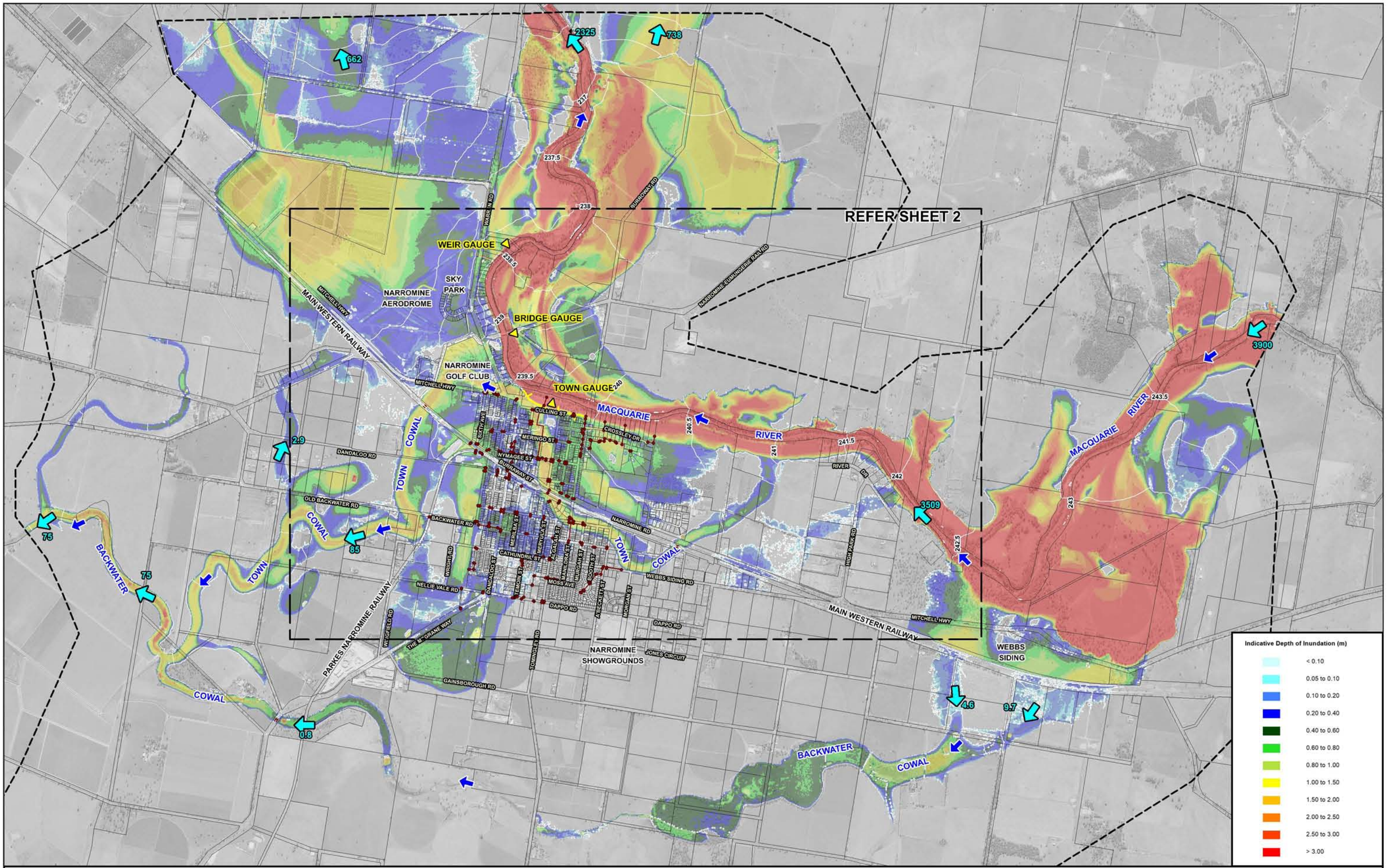
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD) (238.5)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.10
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
2% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

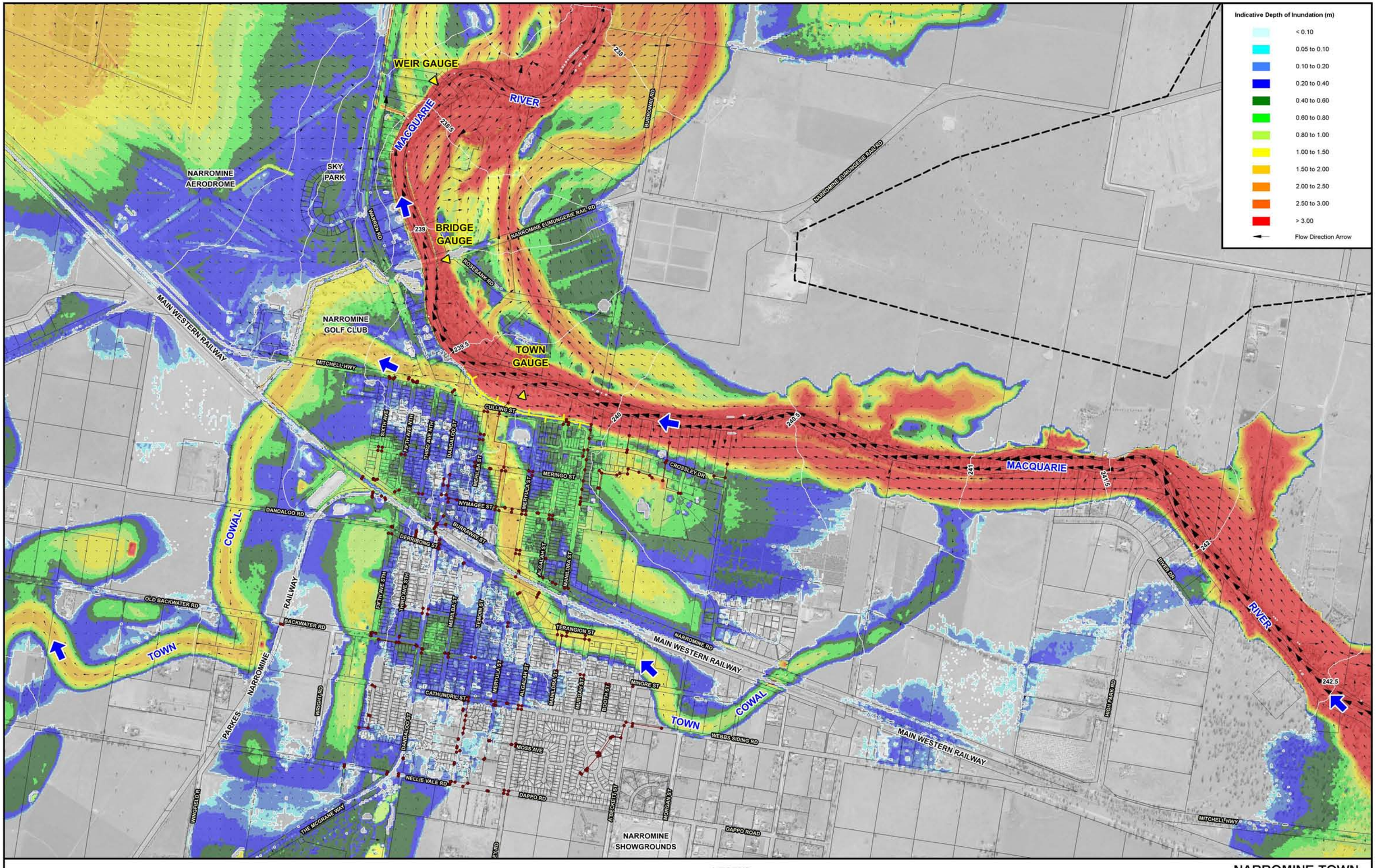
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m^3/s)
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.11
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
1% AEP



N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

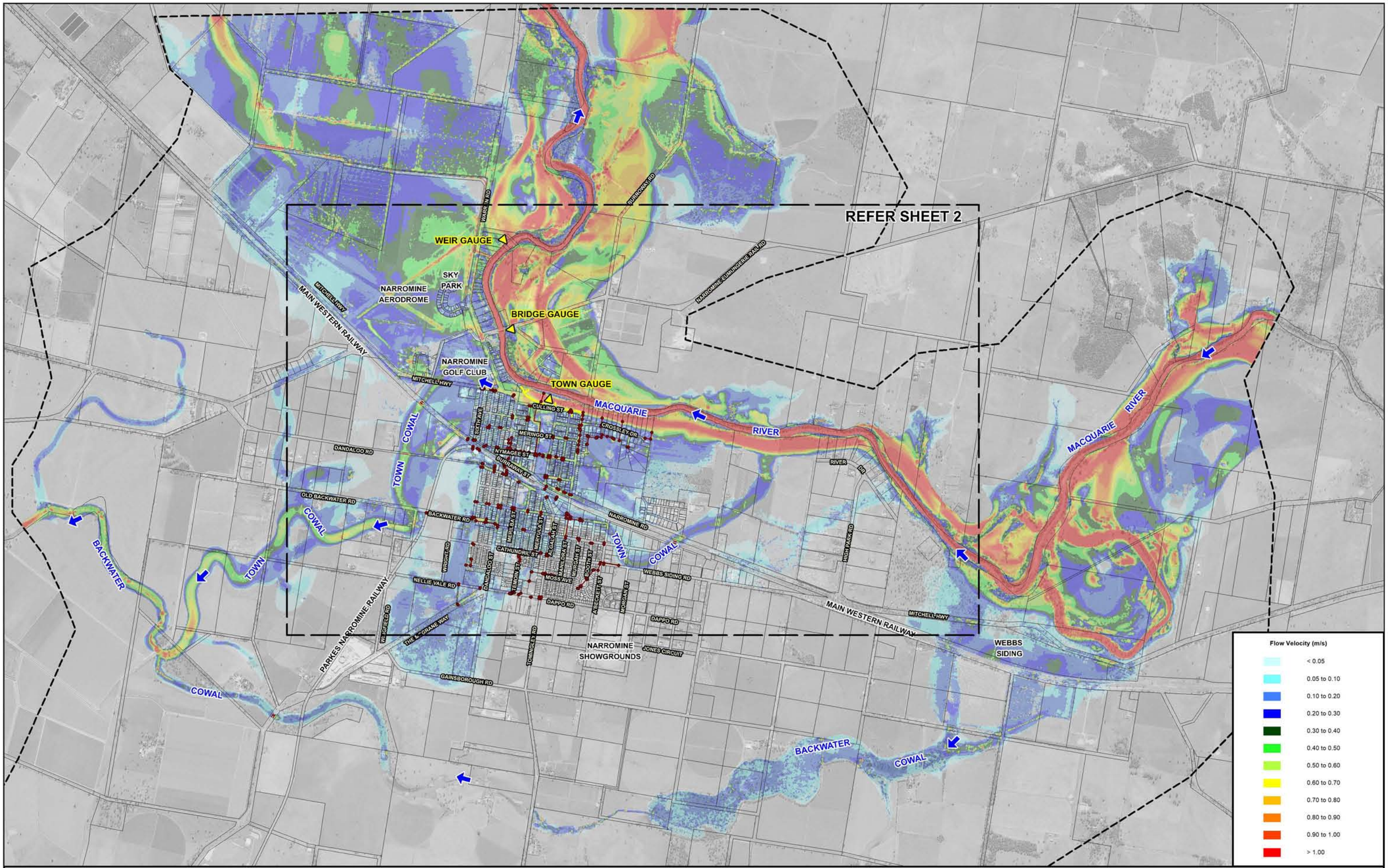
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD) (238.5)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.11
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

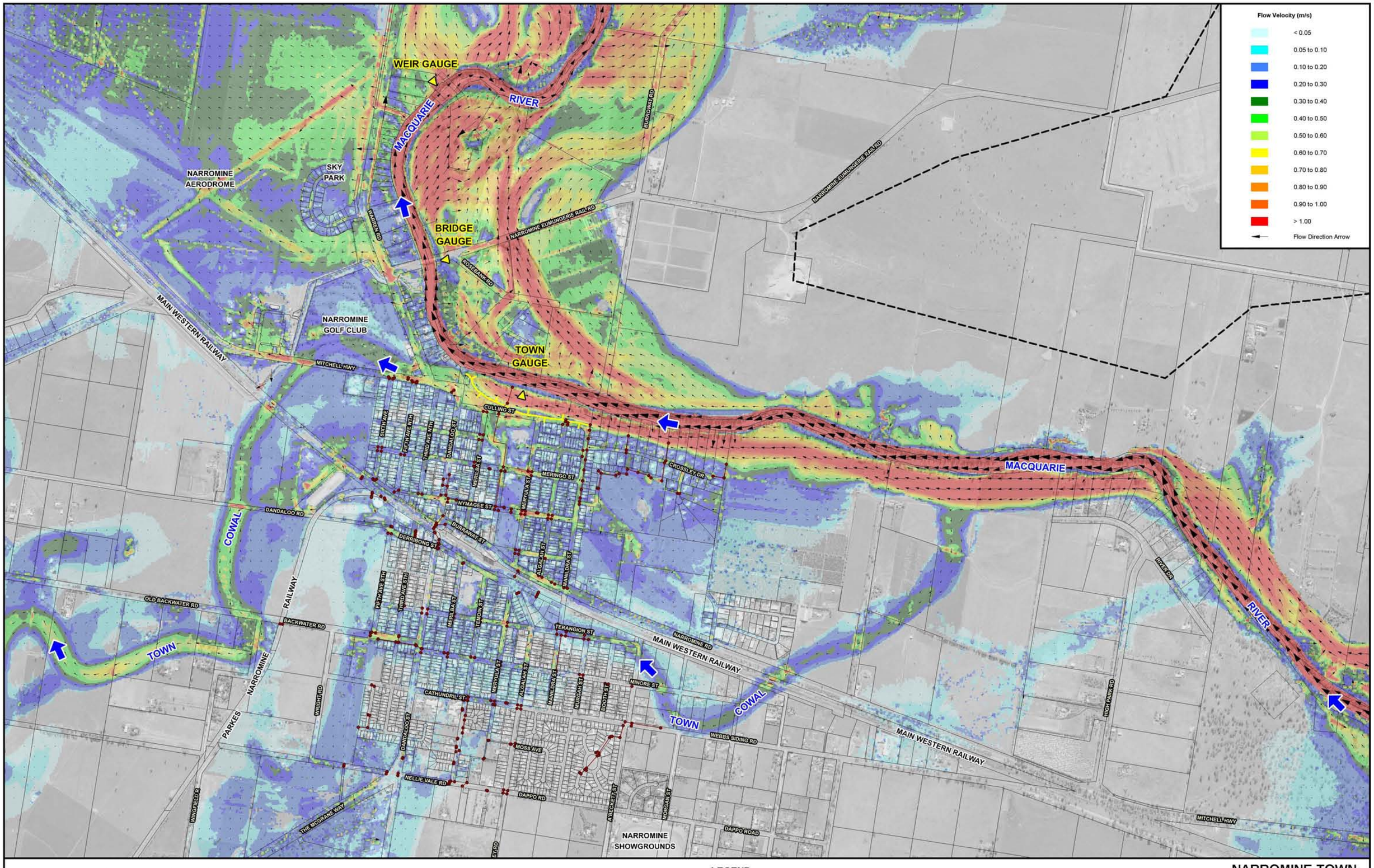
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.12
(Sheet 1 of 2)

MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

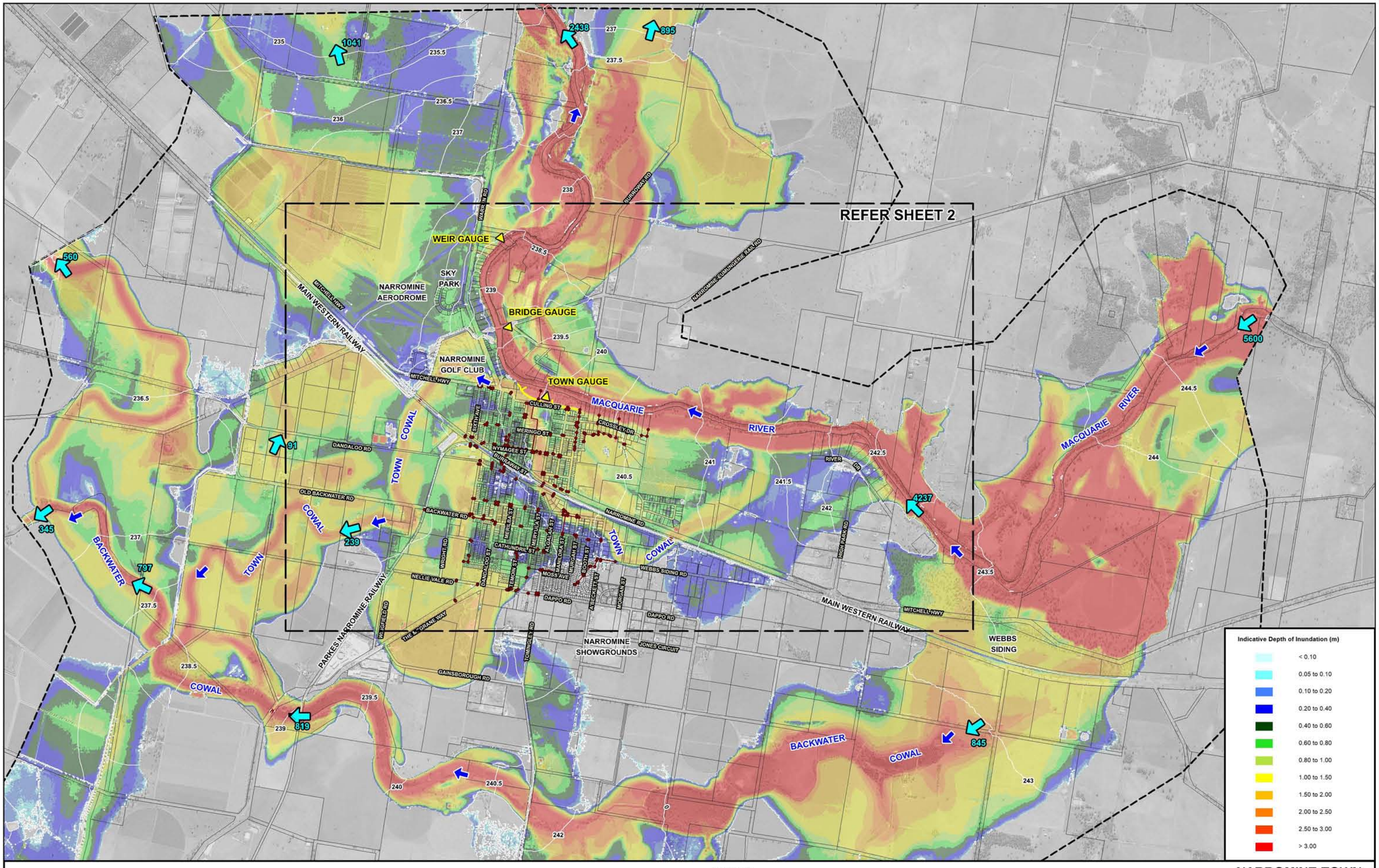
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.12
(Sheet 2 of 2)

MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m^3/s)
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.13
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
0.5% AEP

Indicative Depth of Inundation (m)

- < 0.10
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.40
- 0.40 to 0.60
- 0.60 to 0.80
- 0.80 to 1.00
- 1.00 to 1.50
- 1.50 to 2.00
- 2.00 to 2.50
- 2.50 to 3.00
- > 3.00
- Flow Direction Arrow

WEIR GAUGE
MACQUARIE RIVER
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
MAIN WESTERN RAILWAY
NARROMINE-ELUMUNGERIE RAIL RD
BURRAWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
CULLING ST
CROSSLEY DR
MERINGO ST
NYMAGEE ST
DANDALOO RD
DERRIBONG ST
BURRAWAY ST
COWAL RAILWAY
OLD BACKWATER RD
BACKWATER RD
TERANGION ST
NARROMINE RD
MINORE ST
CATHUNDRIL ST
WEBBS SIDING RD
MOSS AVE
NELLIE VALE RD
DAPPO RD
DAPPO ROAD
THE MCGRANE WAY
WINGFIELD RD
WRIGHT RD
PARKES NARROMINE
BYRD
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERILBA ST
MERKULA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
ABERCHERT ST
MORGAN ST
TEMON ST
FIFTH AVE STH
THIRD AVE STH
HIGH PARK RD
RIVER RD
TOWN
COWAL
238.5
239
239.5
240
240.5
241
241.5
242
242.5
243

N
200 0 200 400 600 m
Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

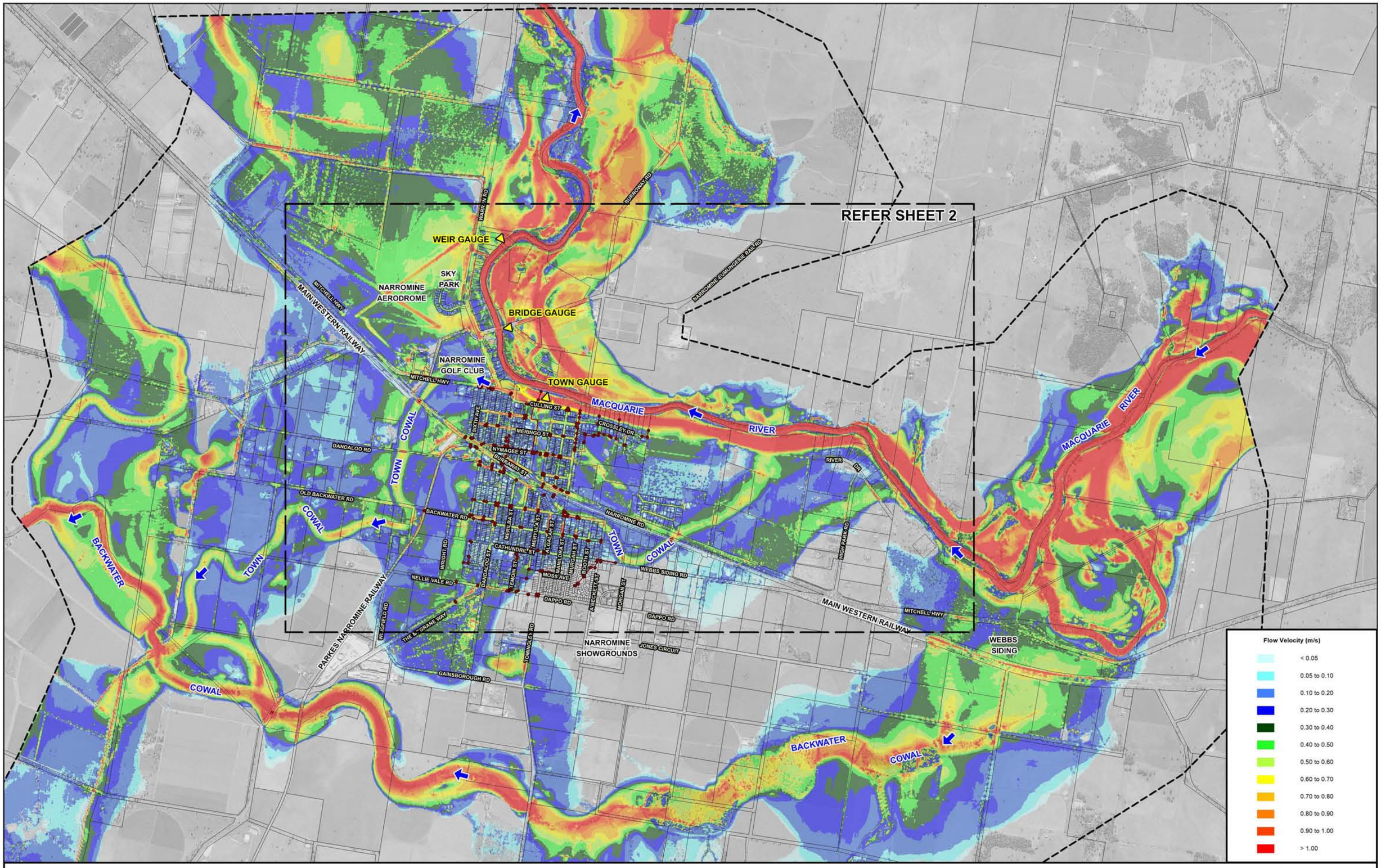
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.13
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
0.5% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

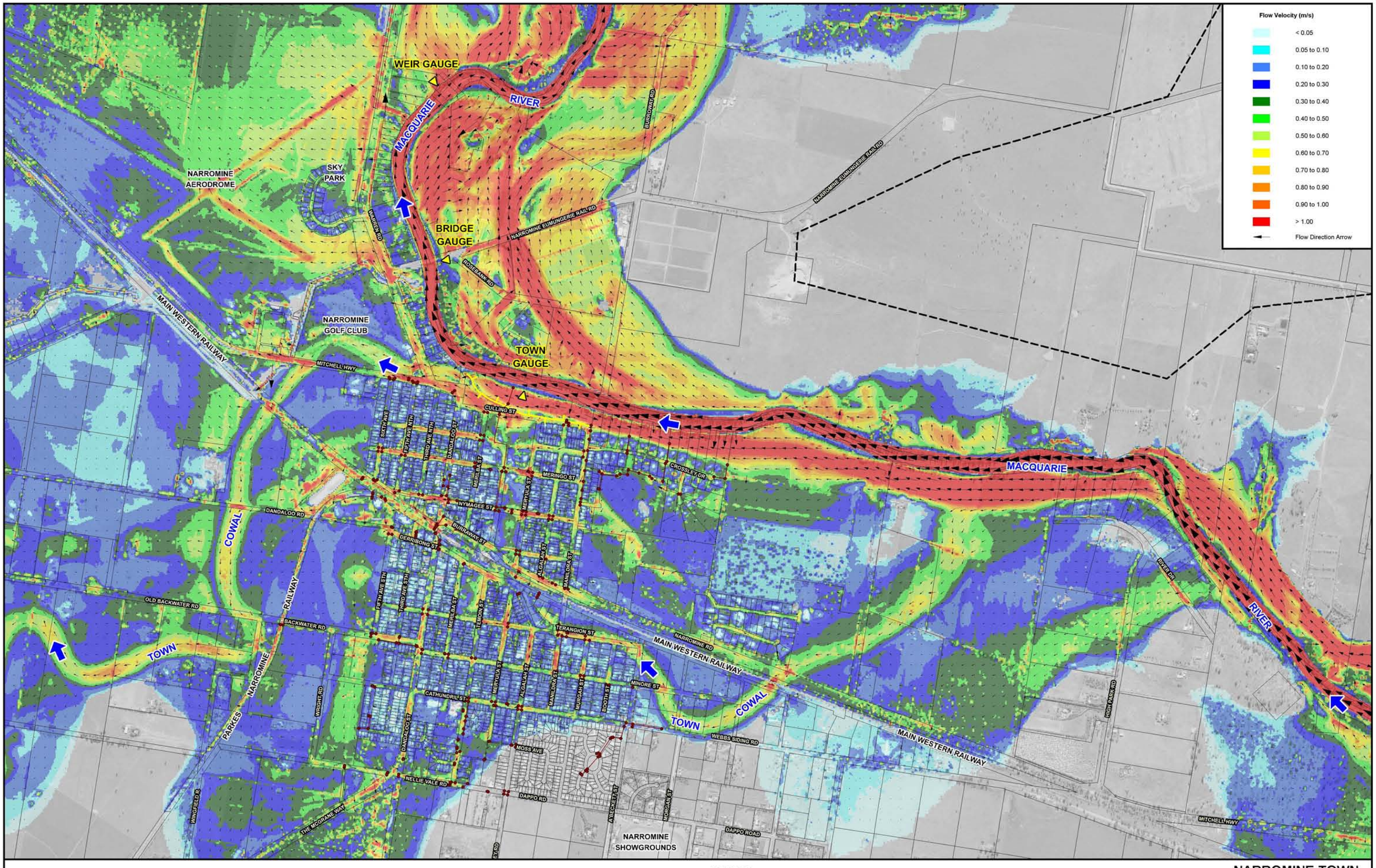
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.14
(Sheet 1 of 2)

MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
0.5% AEP



N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.14
(Sheet 2 of 2)

MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
0.5% AEP

REFER SHEET 2

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING

MACQUARIE RIVER
COWAL
BACKWATER
TOWN

WARREN RD
BURROWAY RD
NARROMINE-GUNNEDAH RAILWAY
MAIN WESTERN RAILWAY
MITCHELL HWY
BIRTH AVE
CULLING ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
NARROMINE RD
RIVER DR
HIGH PARK RD
WEBBS SIDING RD
DAPPO RD
JONES CIRCUIT
OLD BACKWATER RD
BACKWATER RD
NELLIE VALE RD
GAINSBOROUGH RD
THE LORRAINE WAY
WIGFIELD RD
PARKES NARROMINE RAILWAY
TOMINGLEY RD
DANDALOO RD
CATHUNDRIL ST
MERILBA ST
MERVULA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
ANSCHAUT ST
MOSS AVE
TEMORA ST
WRIGHT RD

237 237.5 238 238.5 239 239.5 240 240.5 241 241.5 242 242.5 243 243.5 244 244.5 245 245.5 246 246.5 247 247.5 248

Indicative Depth of Inundation (m)

< 0.10
0.05 to 0.10
0.10 to 0.20
0.20 to 0.40
0.40 to 0.60
0.60 to 0.80
0.80 to 1.00
1.00 to 1.50
1.50 to 2.00
2.00 to 2.50
2.50 to 3.00
> 3.00

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

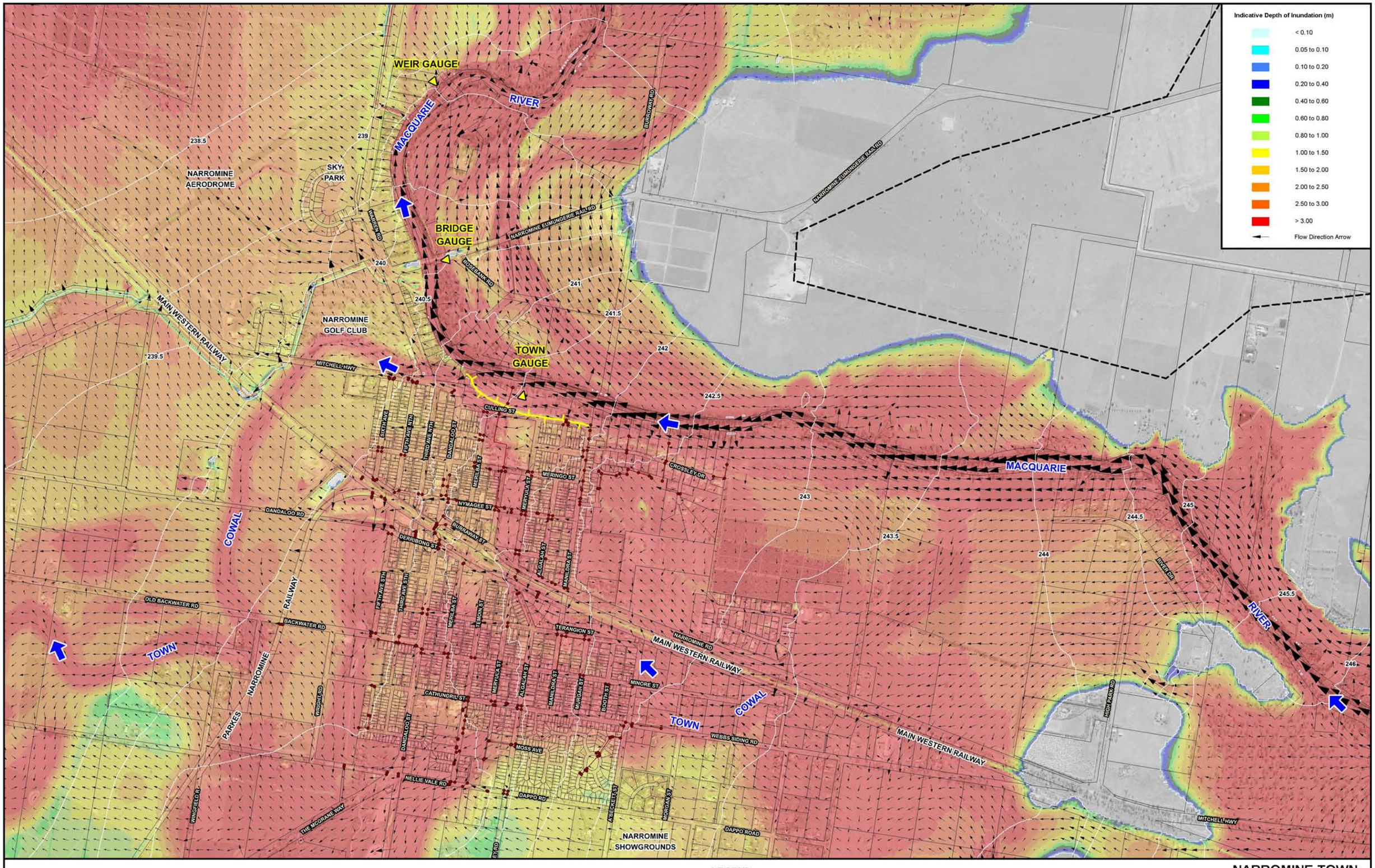
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- 238.5 Water Surface Elevation Contour (m AHD)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.15
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
EXTREME FLOOD



N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

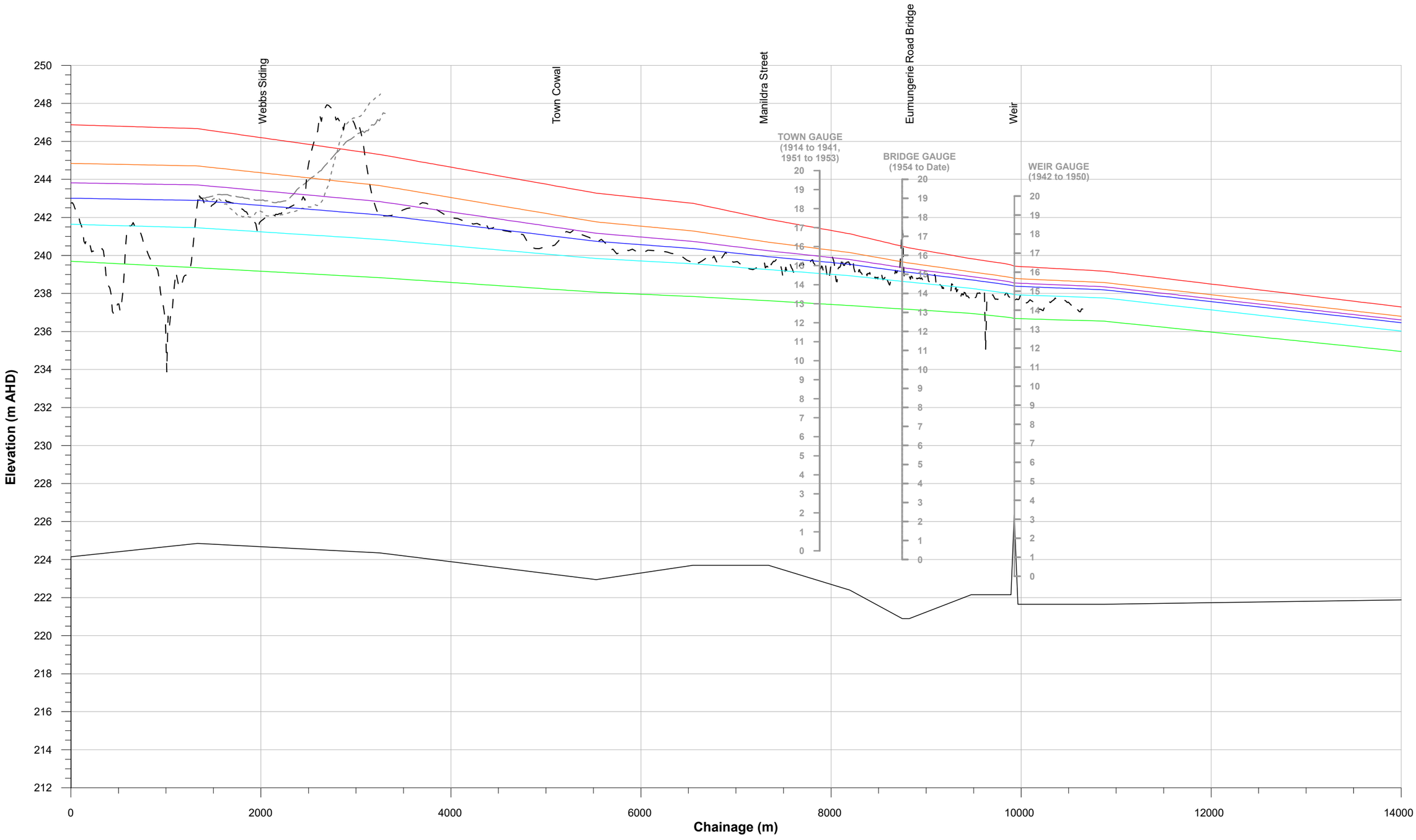
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Water Surface Elevation Contour (m AHD) (238.5)

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.15
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
EXTREME FLOOD



LEGEND

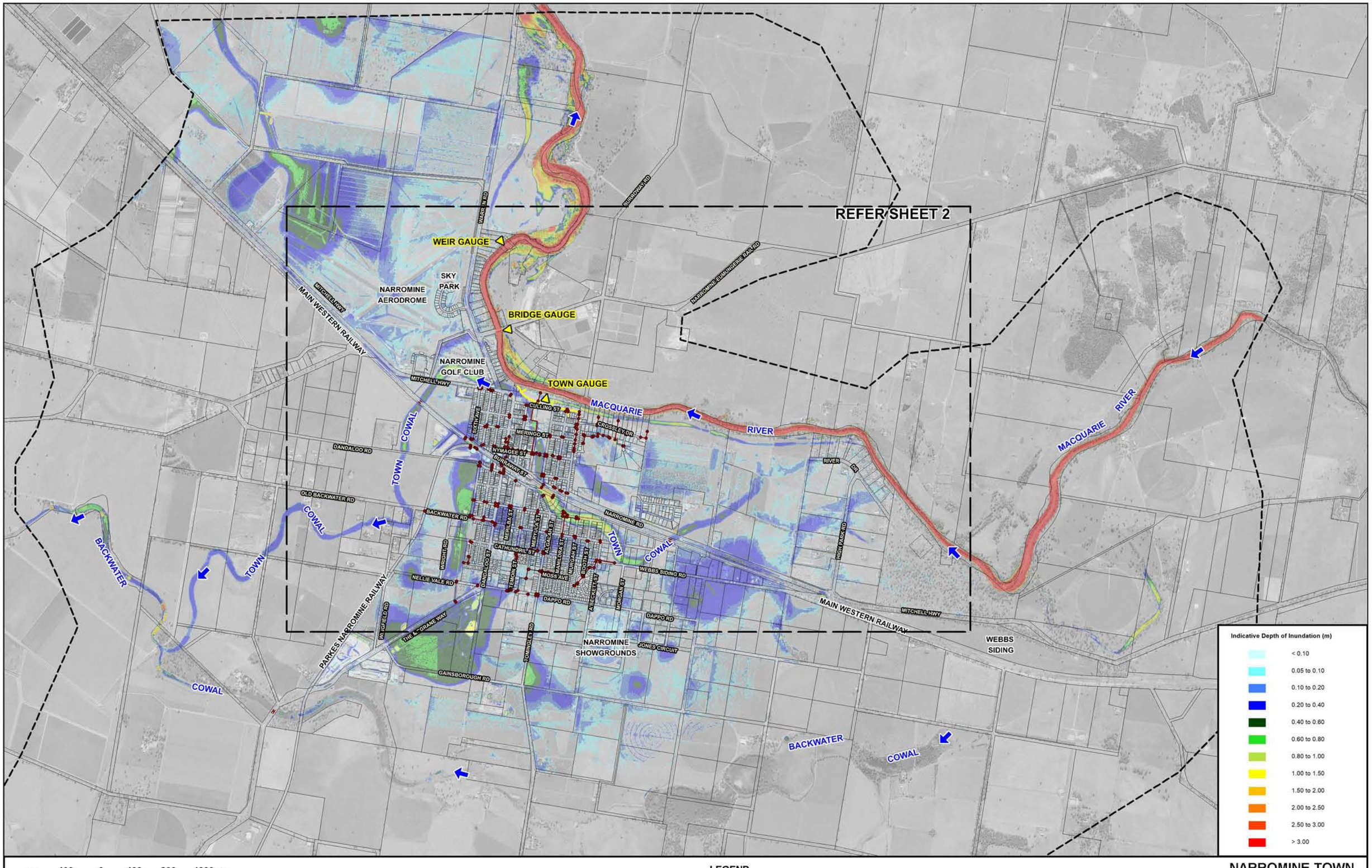
- Extreme Flood
- 0.2% AEP
- 0.5% AEP
- 1% AEP
- 2% AEP
- 5% AEP
- Channel Invert
- LiDAR Survey Data Levels along Southern Bank of Macquarie River
- LiDAR Survey Data Levels along Mitchell Highway
- LiDAR Survey Data Levels along Main Western Railway

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.16

DESIGN WATER SURFACE PROFILES
MACQUARIE RIVER



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.17
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTH OF MAJOR OVERLAND FLOW
1% AEP

Indicative Depth of Inundation (m)

- < 0.10
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.40
- 0.40 to 0.60
- 0.60 to 0.80
- 0.80 to 1.00
- 1.00 to 1.50
- 1.50 to 2.00
- 2.00 to 2.50
- 2.50 to 3.00
- > 3.00

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
MACQUARIE RIVER
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
COWAL
TOWN
BURRAWAY RD
NARROMINE-EUMUNGERIE RAIL RD
WARREN RD
ROSEBANK RD
MAIN WESTERN RAILWAY
MITCHELL HWY
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERRILA ST
MERVILLA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
DANDALOO RD
DERRIBONG ST
BURRAWAY ST
ALGALAH ST
MANILDRA ST
FIFTH AVE STH
THIRD AVE STH
TEMON ST
OLD BACKWATER RD
BACKWATER RD
TERANGION ST
NARROMINE RD
MINORE ST
CATHUNDRIL ST
HURGAH ST
BOOTH ST
WRIGHT RD
PARKES
WINGFIELD R
THE McGRANE WAY
NELLIE VALE RD
DAPPO RD
ABERCKET ST
MORGAN ST
MOSS AVE
WEBBS SIDING RD
DAPPO ROAD
RIVER DR
HIGH MARK RD

N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.17
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF MAJOR OVERLAND FLOW
1% AEP

EXTENT OF INUNDATION

- 5% AEP
- 2% AEP
- 1% AEP
- 0.5% AEP
- Extreme

COMMUNITY ASSET

- Sewer System
- Airport
- Electricity Substation
- Water Supply
- Major Road Crossing and Identifier

EMERGENCY SERVICES

- RFS Station
- Police Station
- F&R NSW Station
- Ambulance Facility
- SES Station
- Evacuation Centre

VULNERABLE DEVELOPMENT

- Educational Facility
- Chid Care Facility
- Caravan Park
- Aged Care Facility
- Hospital

WEIR GAUGE
MACQUARIE RIVER
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
SS8
NARROMINE GOLF CLUB
MAIN WESTERN RAILWAY
MITCHELL HWY
WARREN RD
ROSEBANK RD
BURROWAY RD
NARROMINE EUMUNGERIE RAIL RD
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERILBA ST
MERYULA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DERRIBONG ST
DANDALOO RD
COWAL
OLD BACKWATER RD
BACKWATER RD
RAILWAY
TEMOIN ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
MINORE ST
NARROMINE RD
WEBBS SIDING RD
HIGH PARK RD
RIVER DR
TOWN
PARKES
WRIGHT RD
CATHUNDRIL ST
MOSS AVE
NELLIE VALE RD
DAPPO RD
ARBECKER ST
MORGAN ST
DAPPO ROAD
WINGFIELD R
THE MCGRANE WAY
NARROMINE SHOWGROUNDS
EF1 EF2 EF3 EF4
EC1 EC2
HC1 HC2
AC1 AC2 AC3
CC1 CC2 CC3
CP1 CP2
SS1 SS2 SS3 SS4 SS5 SS6 SS7 SS9
WS1 WS2 WS3
MC1 MC2 MC3 MC4

N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.18

INDICATIVE EXTENT OF MAIN STREAM FLOODING AND LOCATION OF VULNERABLE DEVELOPMENT AND CRITICAL INFRASTRUCTURE

REFER SHEET 2

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING

WARREN RD
BURROWAY RD
NARROMINE-GUNNINGBRIE RAILROAD
MAIN WESTERN RAILWAY
MITCHELL HWY
CULLING ST
MERINGO ST
NYMAGEE ST
BURROWAY ST
CROSSLEY DR
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CATHUNDRIL ST
MERRILBA ST
MERYULA ST
ALGALA ST
BANILDRA ST
GURGAH ST
BOOTH ST
ASHMEAD ST
MORGAN ST
MOSS AVE
DAPPO RD
WEBBS SIDING RD
HIGH PARK RD
NELLIE VALE RD
WRIGHT RD
WITCHFIELD RD
THE M°CRANE WAY
PARKES NARROMINE RAILWAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD

MACQUARIE RIVER
COWAL
TOWN
BACKWATER

Afflux (m)
- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

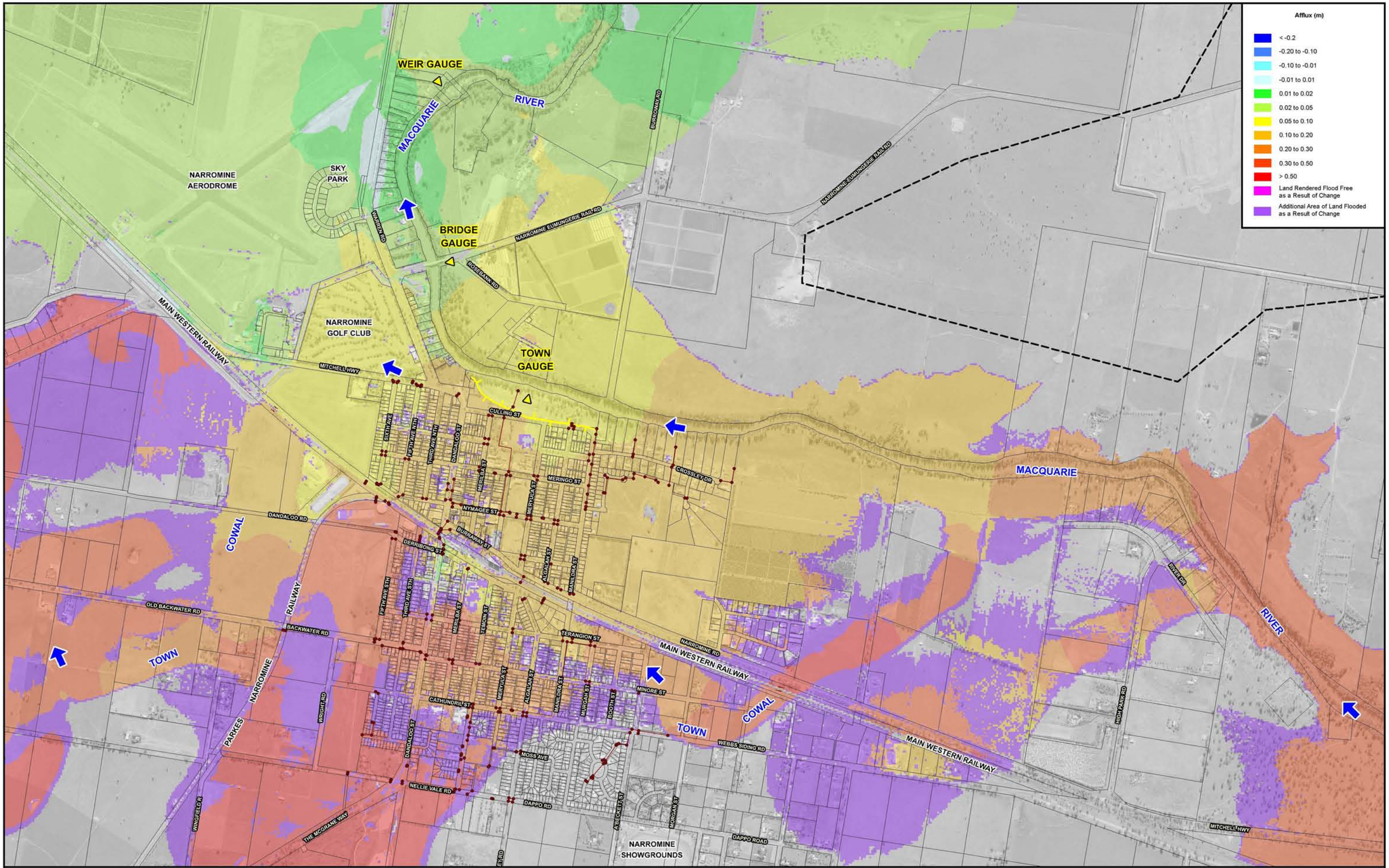
LEGEND

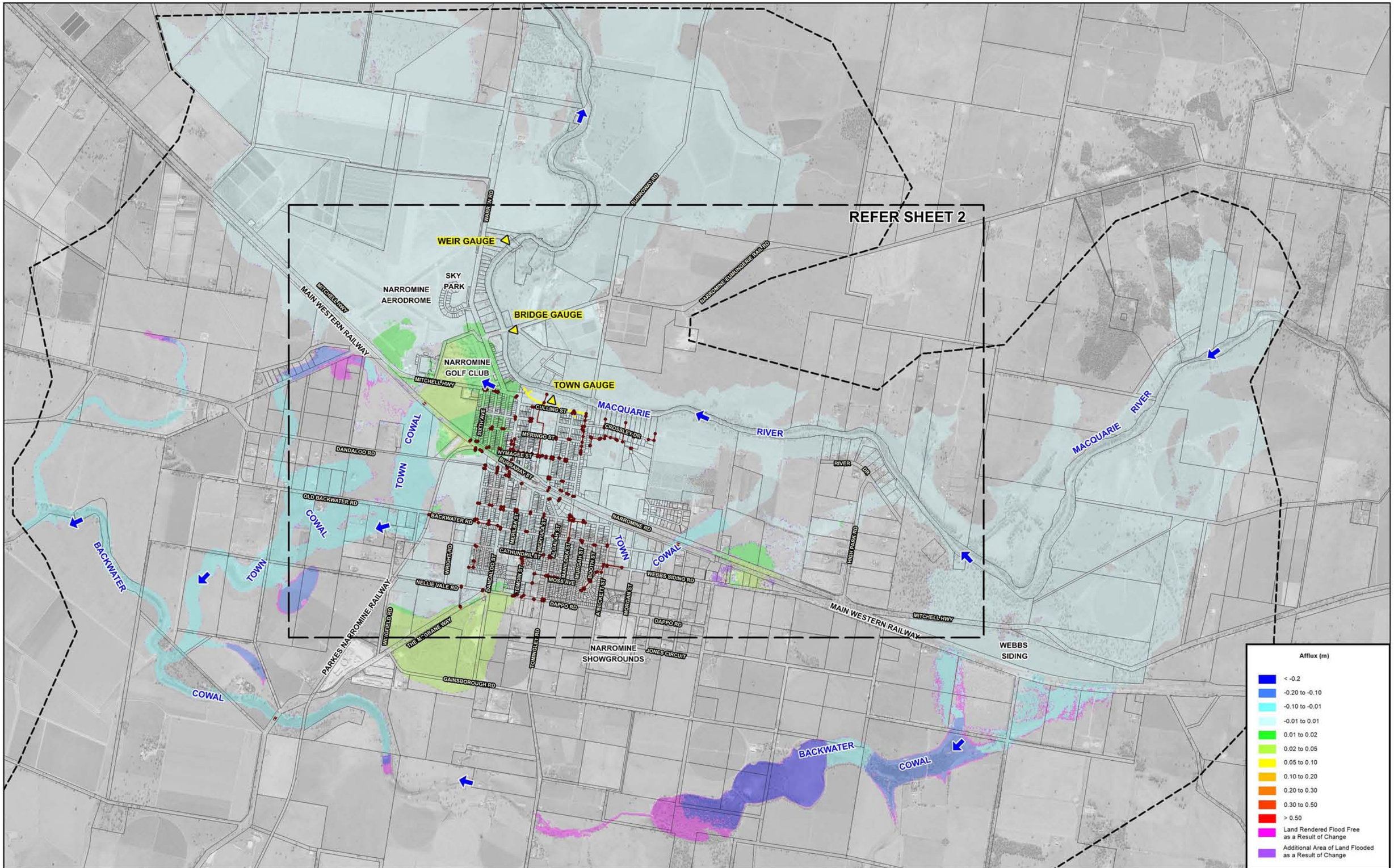
- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.19
(Sheet 1 of 2)

SENSITIVITY OF MAIN STREAM FLOODING TO 20% INCREASE IN HYDRAULIC ROUGHNESS VALUES
1% AEP


Afflux (m)
< -0.2
-0.20 to -0.10
-0.10 to -0.01
-0.01 to 0.01
0.01 to 0.02
0.02 to 0.05
0.05 to 0.10
0.10 to 0.20
0.20 to 0.30
0.30 to 0.50
> 0.50
Land Rendered Flood Free as a Result of Change
Additional Area of Land Flooded as a Result of Change
WEIR GAUGE
MACQUARIE RIVER
BURRAWAY RD
NARROMINE AERODROME
SKY PARK
WARREN RD
BRIDGE GAUGE
NARROMINE EUMUNGERIE RAIL RD
ROSEDALE RD
MAIN WESTERN RAILWAY
NARROMINE GOLF CLUB
MITCHELL HWY
TOWN GAUGE
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERRIBA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
MERRIJULA ST
ALGALAH ST
JANILORA ST
DANDALOO RD
COWAL
DERRIBONG ST
BURRAWAY ST
FIFTH AVE STH
THIRD AVE STH
TEMORA ST
TERANGION ST
NARROMINE RD
MINORE ST
OLD BACKWATER RD
BACKWATER RD
RAILWAY
NARROMINE
PARKES
WRIGHT RD
CATHUNDRIL ST
MANILDRA ST
MURGAH ST
BOOTH ST
TOWN
WEBBS SIDING RD
MOSS AVE
NELLIE VALE RD
DAPPO RD
WINGFIELD DR
THE MCGRANE WAY
ARBECKER ST
MORGAN ST
EYRD
NARROMINE SHOWGROUNDS
DAPPO ROAD
RIVER DR
HIGH PARK RD
MITCHELL HWY
N
200 0 200 400 600 m
Scale: 1:20,000
Lyall & Associates
NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.
LEGEND
Two-Dimensional Model Boundary
Modelled Stormwater Drainage System
Stream Gauge
Town Levee
NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 2.19
(Sheet 2 of 2)
SENSITIVITY OF MAIN STREAM FLOODING TO 20% INCREASE IN HYDRAULIC ROUGHNESS VALUES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.20
(Sheet 1 of 2)

SENSITIVITY OF MAIN STREAM FLOODING TO PARTIAL BLOCKAGE OF HYDRAULIC STRUCTURES
1% AEP

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.20
(Sheet 2 of 2)

SENSITIVITY OF MAIN STREAM FLOODING TO PARTIAL BLOCKAGE OF HYDRAULIC STRUCTURES
1% AEP

REFER SHEET 2

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE

NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING

WARREN RD
BURROWAY RD
NARROMINE-GUNNINGBRIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURROWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CATHUNDRIL ST
MERRIBA ST
MERRILLA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
MOSS AVE
ALBERT ST
MORGAN ST
WEBBS SIDING RD
HIGH PARK RD
NELLIE VALE RD
WRIGHT RD
KEMORI ST
DAPPO RD
THE M^GRANE WAY
WRIGFIELD RD
PARKES NARROMINE RAILWAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
RIVER DR

MACQUARIE RIVER
TOWN COWAL
BACKWATER
COWAL

Afflux (m)
- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.21
(Sheet 1 of 2)

POTENTIAL IMPACT OF CLIMATE CHANGE ON MAIN STREAM FLOODING
1% AEP

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
MACQUARIE RIVER
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
MAIN WESTERN RAILWAY
NARROMINE EUMUNGERIE RAIL RD
BURRAWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERILDA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
MERKULA ST
BURRAWAY ST
DANDALOO RD
COWAL
DERRIBONG ST
ALGALAH ST
MANILDRA ST
FIFTH AVE STH
THIRD AVE STH
TEMORA ST
TERANGION ST
NARROMINE RD
MINORE ST
CATHUNDRIL ST
MERVILLA ST
MURGAH ST
BOOTH ST
OLD BACKWATER RD
BACKWATER RD
RAILWAY
NARROMINE
PARKES
WRIGHT RD
WINGFIELD R
THE McGRANE WAY
NELLIE VALE RD
DAPPO RD
MOSS AVE
ABERCKET ST
MORGAN ST
DAPPO ROAD
WEBBS SIDING RD
HIGH PARK RD
RIVER DR
TOWN

N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

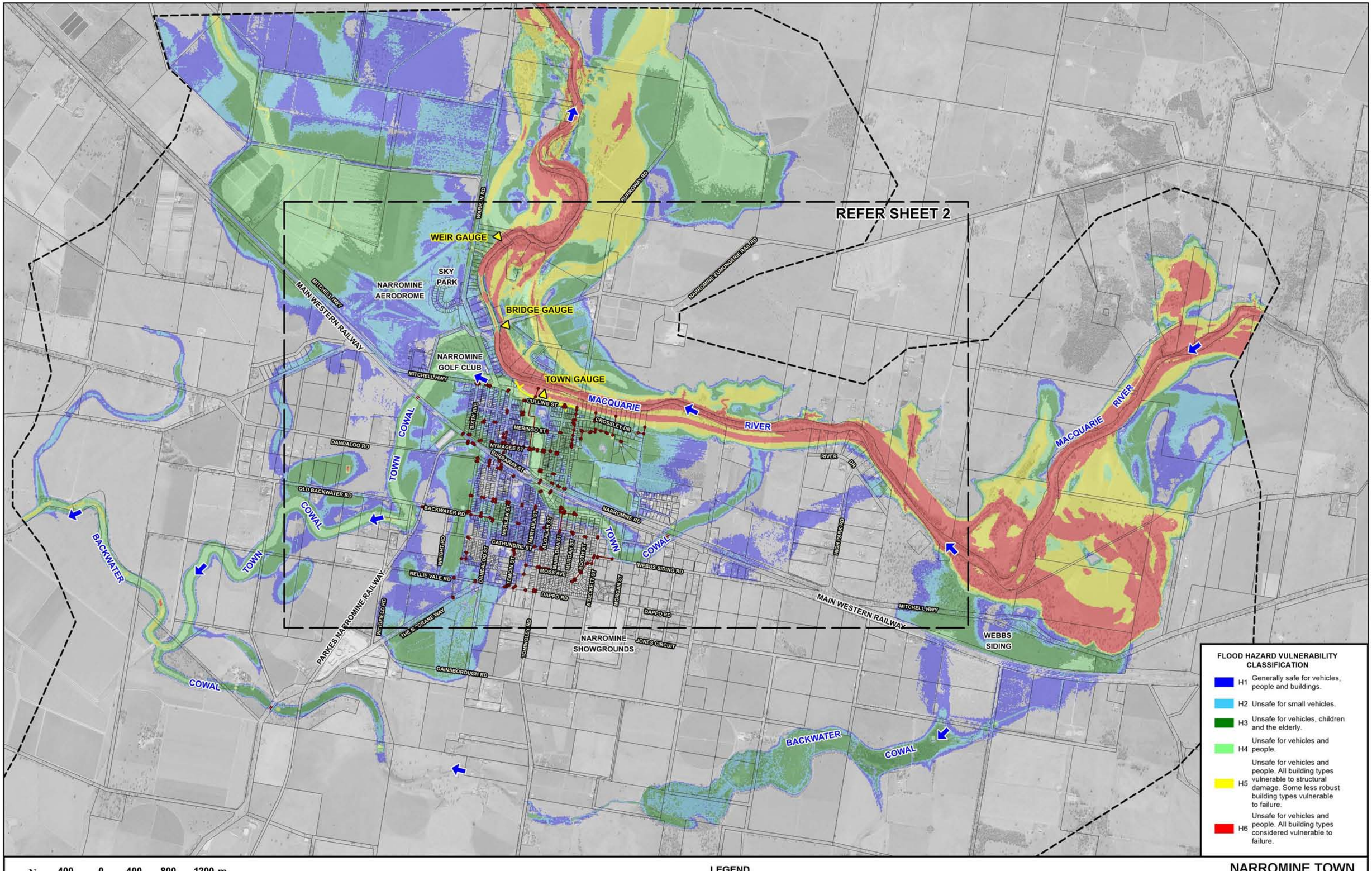
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.21
(Sheet 2 of 2)

POTENTIAL IMPACT OF CLIMATE CHANGE ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.22
(Sheet 1 of 2)

FLOOD HAZARD VULNERABILITY CLASSIFICATION - MAIN STREAM FLOODING
1% AEP

FLOOD HAZARD VULNERABILITY CLASSIFICATION

H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles, children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
MACQUARIE RIVER
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
MAIN WESTERN RAILWAY
NARROMINE EUMUNGERIE RAIL RD
NARROMINE-EUMUNGERIE RAIL RD
BURRAWAY RD
WARREN RD
ROSEBANK RD
MITCHELL HWY
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERILDA ST
MERYULA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
DANDALOO RD
COWAL
DERRIBONG ST
BURRAWAY ST
ALGALAH ST
MANILDRA ST
FIFTH AVE STH
THIRD AVE STH
TEMON ST
TERANGION ST
NARROMINE RD
MINORE ST
HURGAH ST
BOOTH ST
CATHUNDRIL ST
OLD BACKWATER RD
BACKWATER RD
RAILWAY
TOWN
NARROMINE
WRIGHT RD
PARKES
WINGFIELD RD
NELLIE VALE RD
DAPPO RD
THE MCGRANE WAY
MOSS AVE
WEBBS SIDING RD
ARBECKER ST
MORGAN ST
DAPPO ROAD
HIGH PARK RD
RIVER RD

N

200 0 200 400 600 m

Scale: 1:20,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.22
(Sheet 2 of 2)

FLOOD HAZARD VULNERABILITY CLASSIFICATION - MAIN STREAM FLOODING
1% AEP

REFER SHEET 2

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE

NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING

MAIN WESTERN RAILWAY
PARKES NARROMINE RAILWAY
NARROMINE-GUNNEDAH RAILROAD

MITCHELL HWY
BURROWAY RD
WARRIN RD
CULLING ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
WEBBS SIDING RD
DAPPO RD
GAINSBOROUGH RD
NELLIE VALE RD
WRIGHTS RD
WRIGHFIELD RD
THE McGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
HIGH PARK RD
RIVER DR
SIXTH AVE
MERRIBA ST
MERYULA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
ABERCKEET ST
MORGAN ST
CATHUNDRIL ST
TEMORA ST
MOSS AVE

COWAL
TOWN COWAL
BACKWATER
MACQUARIE RIVER

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

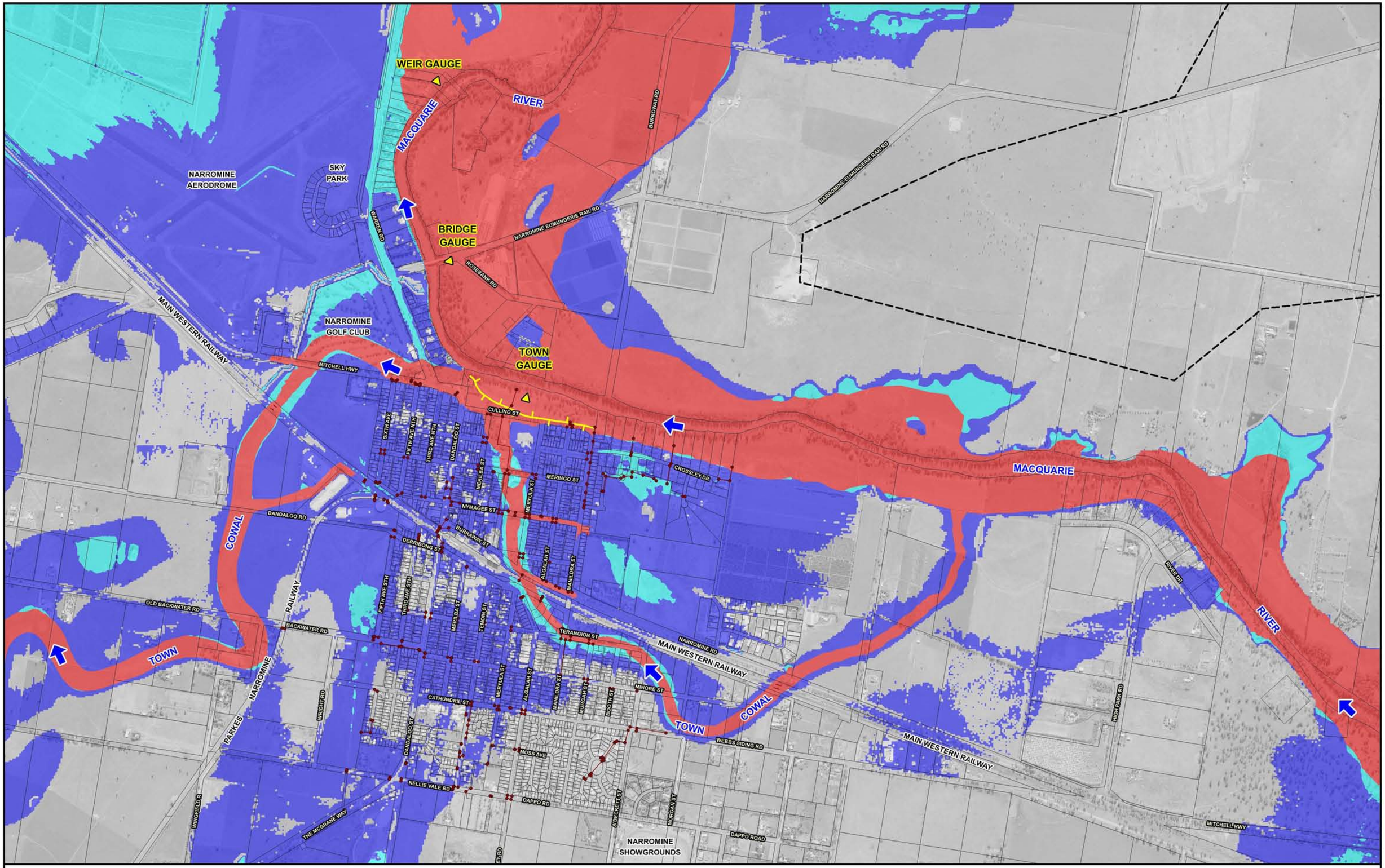
LEGEND

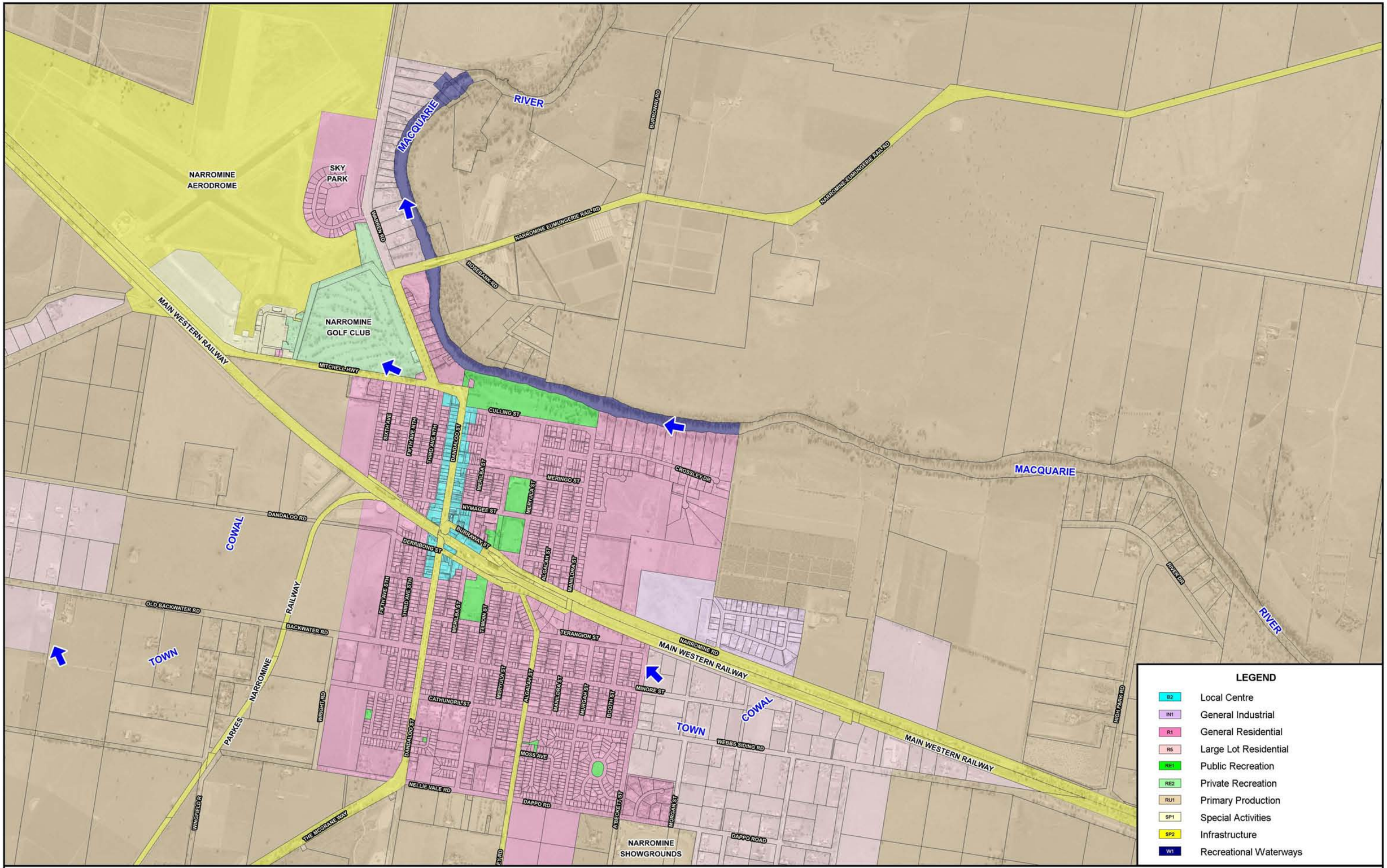
- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee
- Floodway
- Flood Storage
- Flood Fringe

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.23
(Sheet 1 of 2)

HYDRAULIC CATEGORISATION OF FLOODPLAIN - MAIN STREAM FLOODING
1% AEP


WEIR GAUGE
MACQUARIE RIVER
BURROWAY RD
NARROMINE AERODROME
SKY PARK
WARREN RD
BRIDGE GAUGE
NARROMINE EUMUNGERIE RAIL RD
NARROMINE-EUMUNGERIE RAIL RD
ROSEBANK RD
MAIN WESTERN RAILWAY
NARROMINE GOLF CLUB
MITCHELL HWY
TOWN GAUGE
CULLING ST
SIXTH AVE
FIFTH AVE NTH
THIRD AVE NTH
DANDALOO ST
MERIBLA ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
MERVULA ST
DANDALOO RD
COWAL
BURRAWAY ST
DERRIBONG ST
ALGALAH ST
MANILDRA ST
MACQUARIE
RIVER DR
RIVER
FIFTH AVE STH
THIRD AVE STH
TEMORA ST
OLD BACKWATER RD
RAILWAY
BACKWATER RD
TERANGION ST
NARROMINE RD
MAIN WESTERN RAILWAY
TOWN
NARROMINE
WRIGHT RD
CATHUNDRIL ST
MURGAH ST
BOOTH ST
MINORE ST
COWAL
PARKES
WEBBS SIDING RD
MAIN WESTERN RAILWAY
HIGHPARK RD
MOSS AVE
NELLIE VALE RD
DAPPO RD
ARRECKEM ST
MORGAN ST
WINGFIELD RD
THE McGRANE WAY
NARROMINE SHOWGROUNDS
DAPPO ROAD
MITCHELL HWY
N
200 0 200 400 600 m
Scale: 1:20,000
NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.
LEGEND
Two-Dimensional Model Boundary
Modelled Stormwater Drainage System
Stream Gauge
Town Levee
Floodway
Flood Storage
Flood Fringe
Lyall & Associates
NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 2.23
(Sheet 2 of 2)
HYDRAULIC CATEGORISATION OF FLOODPLAIN - MAIN STREAM FLOODING
1% AEP



N

200 0 200 400 600 m

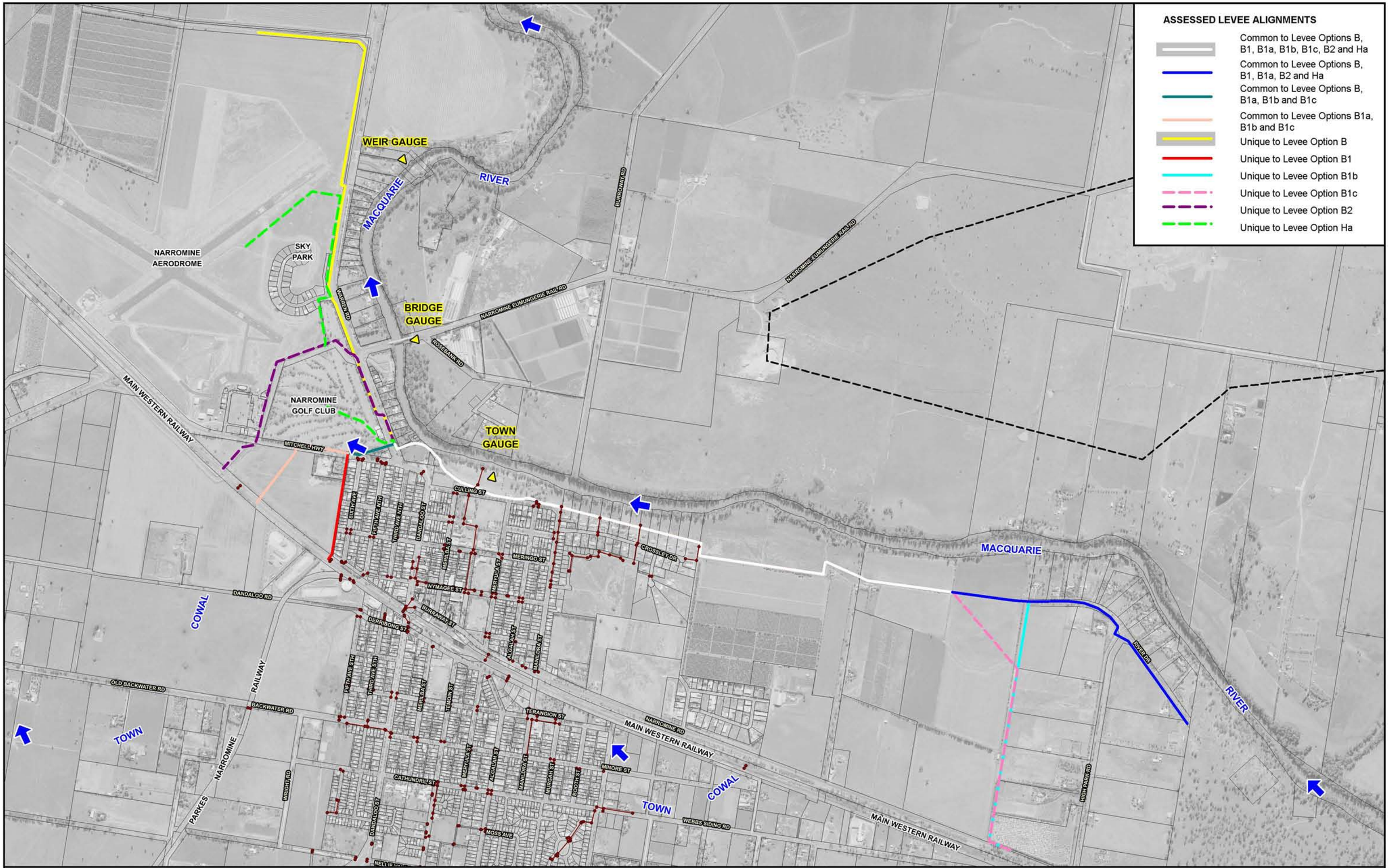
Scale: 1:20,000

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 2.24

NARROMINE LEP 2011 ZONING

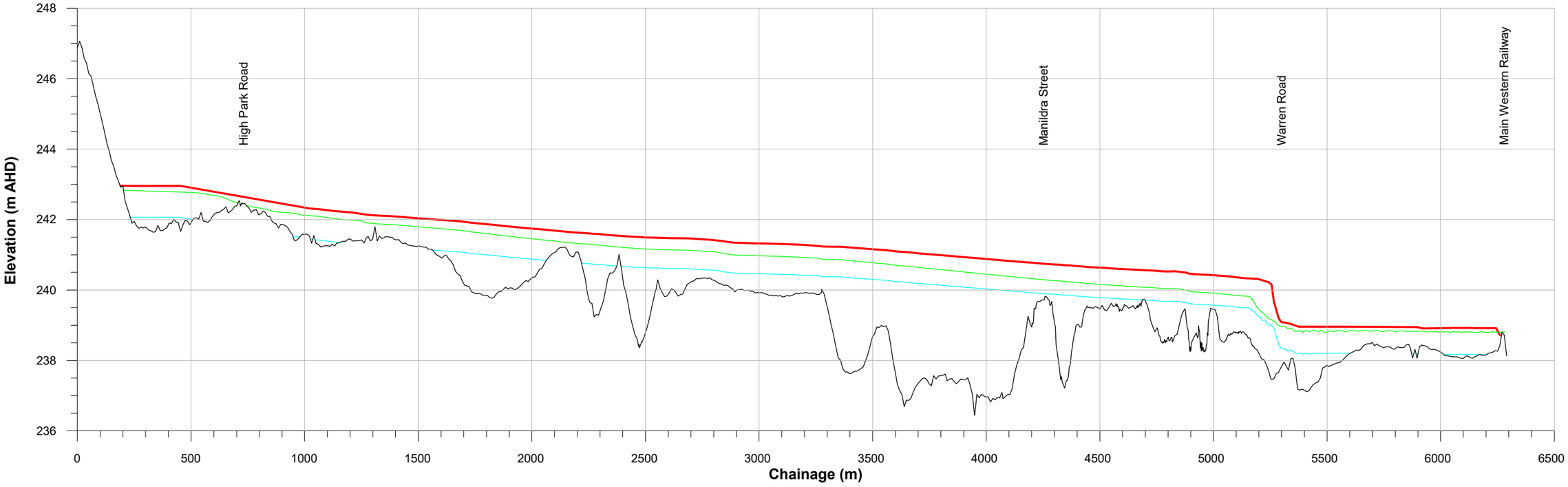


Lyall & Associates

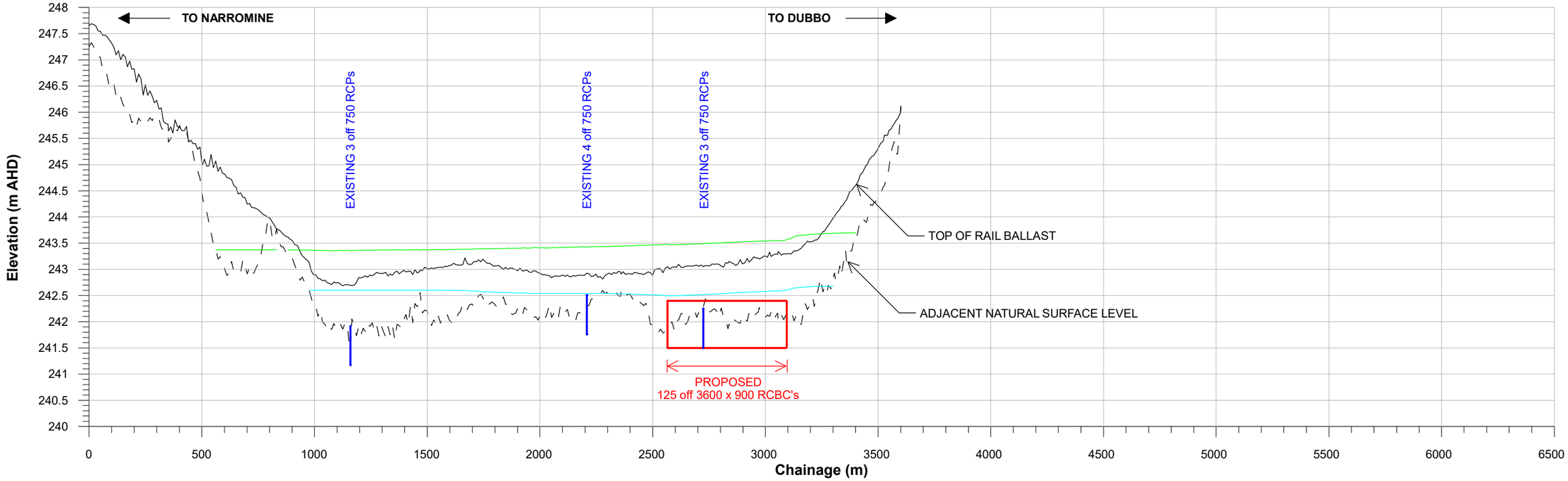
NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 3.1

ASSESSED RIVER BANK LEVEE ALIGNMENTS AND RAIL UPGRADE WORKS

LEVEE OPTION B1a



EXISTING RAIL EMBANKMENT AT WEBBS SIDING



LEGEND

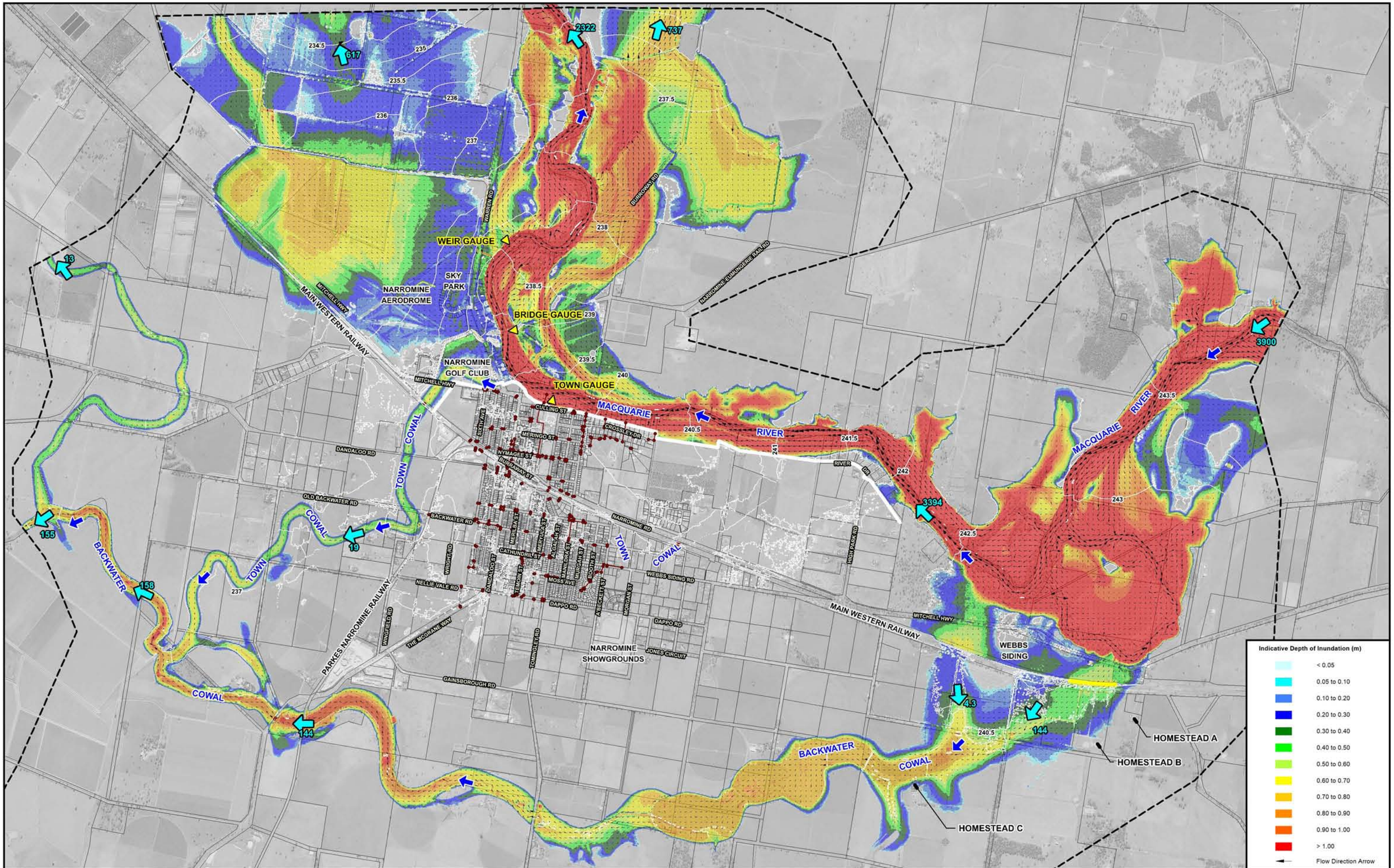
- Crest Level
- 0.5% AEP Peak Flood Level
- 1% AEP Peak Flood Level
- Existing Natural Surface Level

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.2

LONG SECTIONS OF PREFERRED FLOOD MITIGATION SCHEME



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

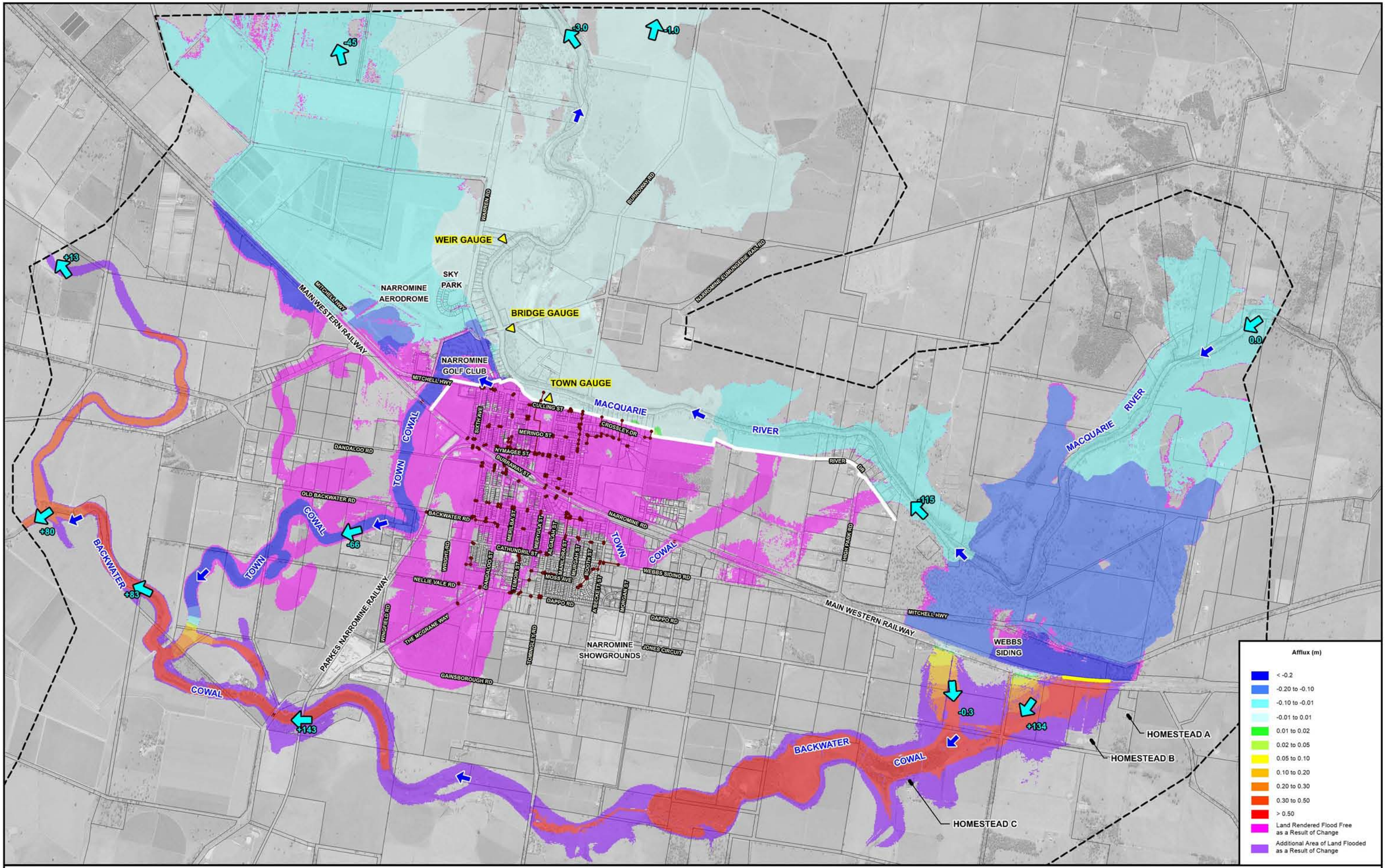
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 5600 Peak Overland Flow(m^3/s)
- 238.5 Water Surface Elevation Contour (m AHD)
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.3

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
POST-PREFERRED FLOOD MITIGATION SCHEME CONDITIONS - 1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- +13 Change in Peak Overland Flow (m^3/s) (A positive value represents an increase, and conversely a negative value represents a decrease in peak flow when compared to baseline conditions.)
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 3.4

IMPACT OF PREFERRED FLOOD MITIGATION SCHEME ON MAIN STREAM FLOODING
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
HOMESTEAD A
HOMESTEAD B
HOMESTEAD C
WARREN RD
BURRAWAY RD
NARROMINE-SUNUNDGERIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
MACQUARIE RIVER
RIVER DR
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
NARROMINE RD
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
COWAL
TOWN COWAL
BACKWATER
MERILDA ST
MERVYLA ST
ALGALAH ST
CATHUNDRIL ST
MANILDRA ST
MURGAH ST
BOOTH ST
ARBECHEM ST
MOSS AVE
LEMAN ST
DANDALOO ST
WRIGHT RD
NELLIE VALE RD
DAPPO RD
WINGFIELD RD
THE McGRANE WAY
PARKES NARROMINE RAILWAY
TOMINGLEY RD
GAINSBOROUGH RD
JONES CIRCUIT
WEBBS SIDING RD
HIGH PARK RD

Velocity Afflux (m/s)

- < -0.50
- -0.50 to -0.20
- -0.20 to -0.10
- -0.10 to -0.05
- -0.05 to 0.05
- 0.05 to 0.10
- 0.10 to 0.15
- 0.15 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

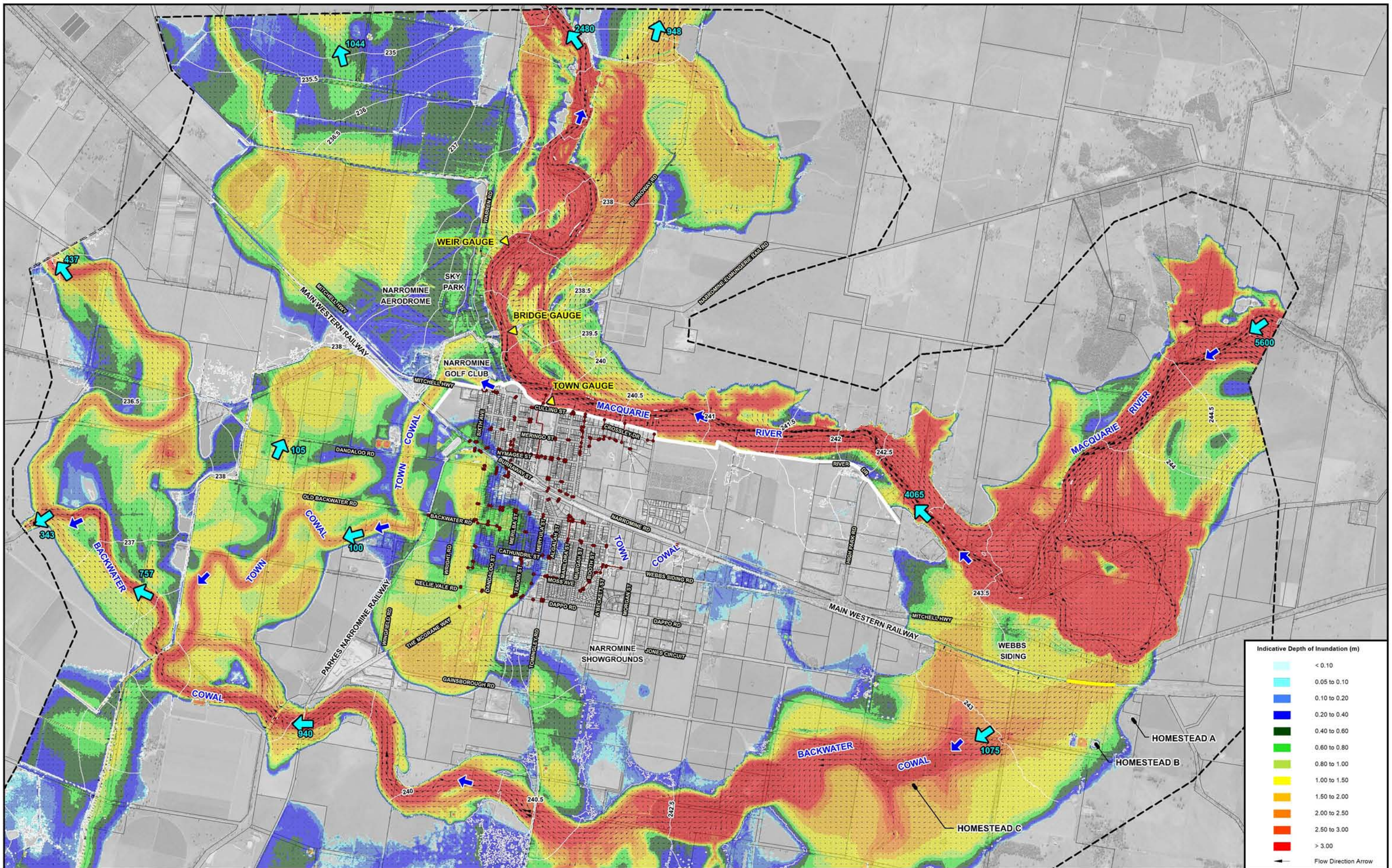
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 3.5

IMPACT OF PREFERRED FLOOD MITIGATION SCHEME ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Peak Overland Flow(m^3/s) (5600)
- Water Surface Elevation Contour (m AHD) (238.5)
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.6

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
POST-PREFERRED FLOOD MITIGATION SCHEME CONDITIONS - 0.5% AEP

+3.0
+42
+53
-123
WEIR GAUGE
WARREN RD
BURROWAY RD
NARROMINE-GUNUNGBRIE RAIL RD
SKY PARK
NARROMINE AERODROME
MAIN WESTERN RAILWAY
MITCHELL HWY
BRIDGE GAUGE
NARROMINE GOLF CLUB
TOWN GAUGE
MACQUARIE RIVER
0.0
+14
DANDALOO RD
COWAL
TOWN
SIXTH AVE
CULLING ST
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
RIVER DR
-172
-2.0
BACKWATER
-40
OLD BACKWATER RD
BACKWATER RD
-139
MERILBA ST
MERVULA ST
ALGALAH ST
CATHUNDRIL ST
NARROMINE RD
HIGH PARK RD
WRIGHT RD
DANDALOO ST
TEMORA ST
BARWILDRA ST
MURGAH ST
BOOTH ST
MOSS AVE
WEBBS SIDING RD
NELLIE VALE RD
DAPPO RD
ASHCHETT ST
MORGAN ST
MAIN WESTERN RAILWAY
MITCHELL HWY
PARKES NARROMINE RAILWAY
WINGFIELD RD
THE MCGRANE WAY
TOMINGLEY RD
NARROMINE SHOWGROUNDS
JONES CIRCUIT
WEBBS SIDING
GAINSBOROUGH RD
COWAL
+121
BACKWATER
COWAL
+230
HOMESTEAD A
HOMESTEAD B
HOMESTEAD C

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

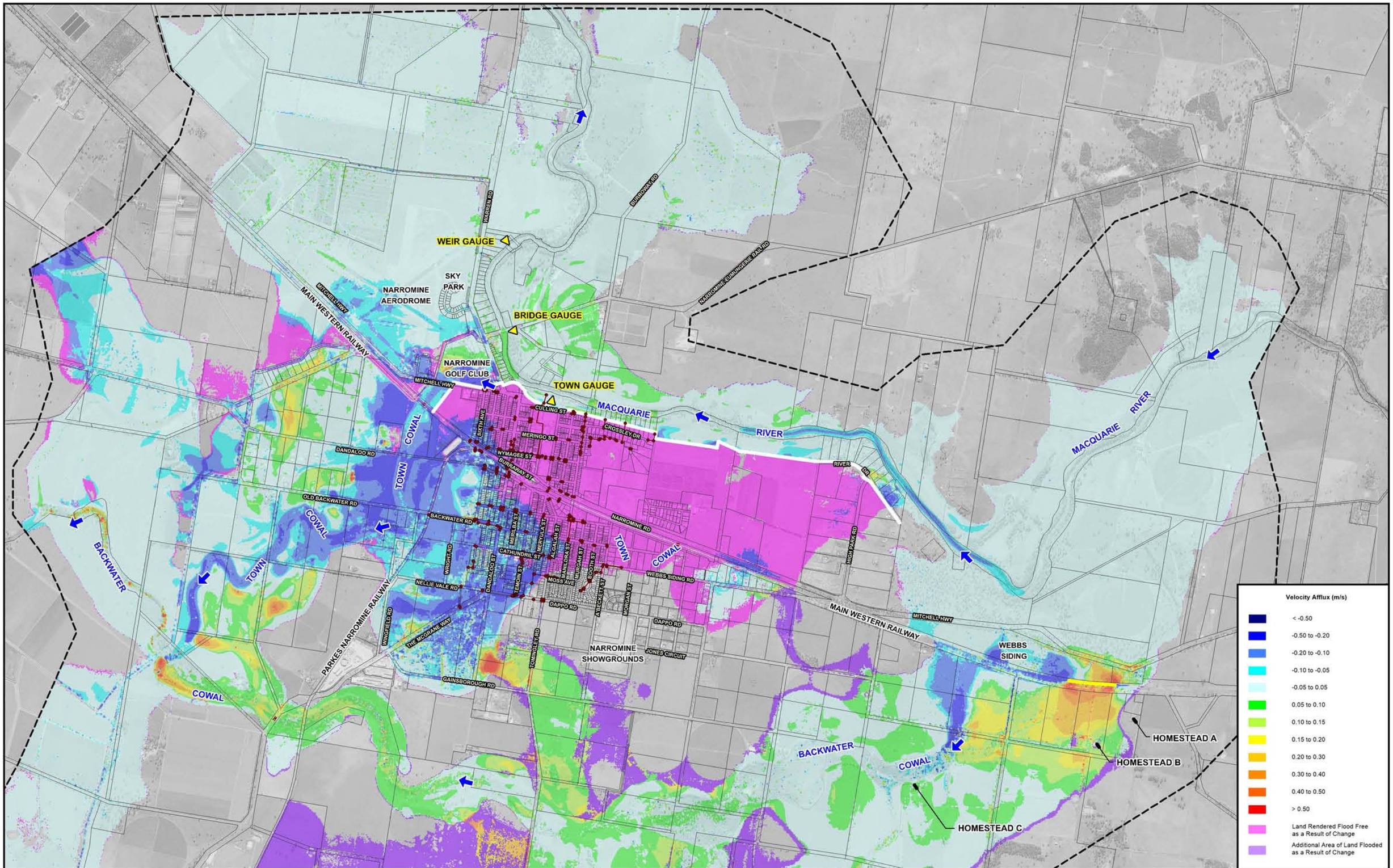
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- +13 Change in Peak Overland Flow (m³/s) (A positive value represents an increase, and conversely a negative value represents a decrease in peak flow when compared to baseline conditions.)
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.7

IMPACT OF PREFERRED FLOOD MITIGATION SCHEME ON MAIN STREAM FLOODING
0.5% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

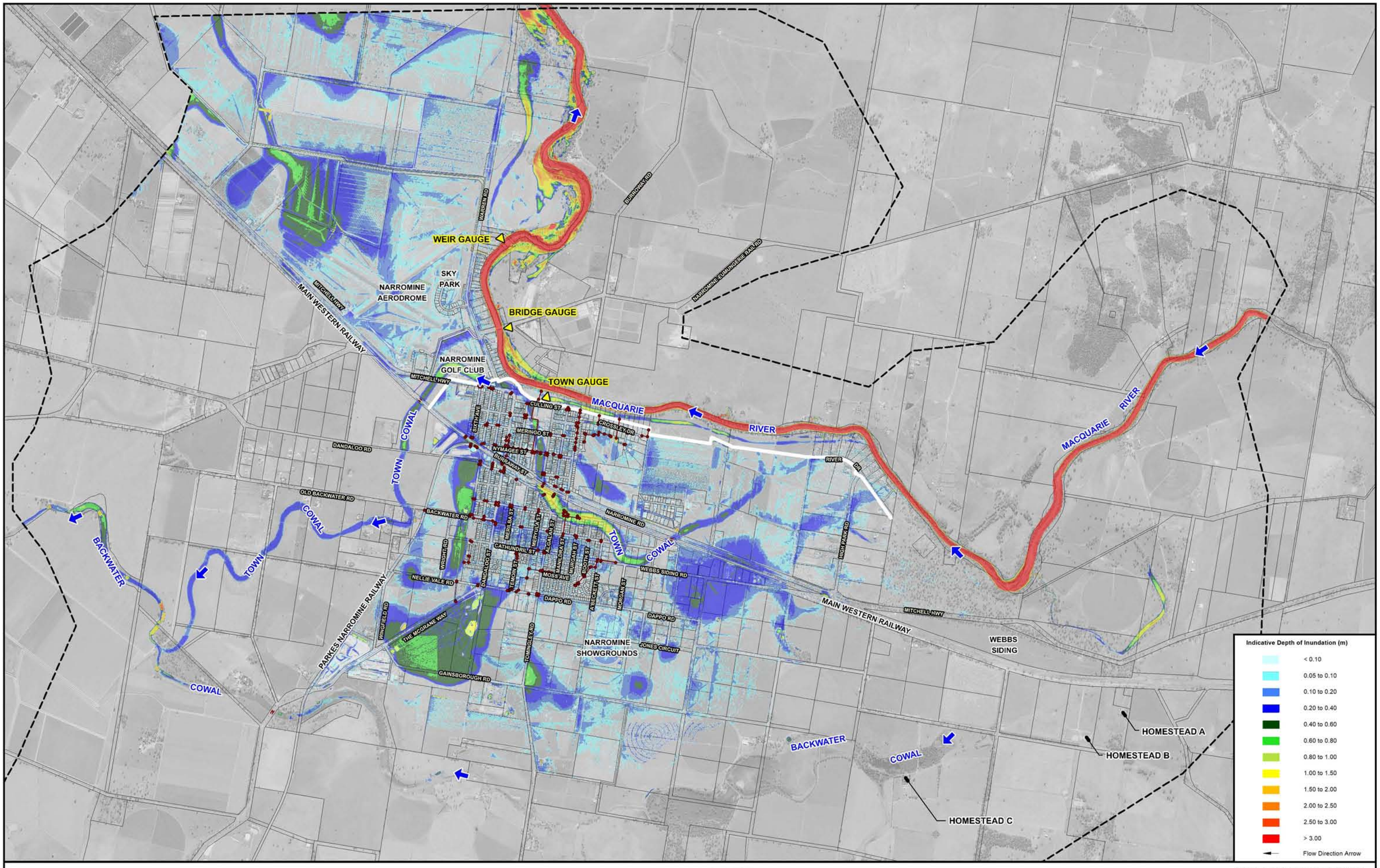
- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN

FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.8

IMPACT OF PREFERRED FLOOD MITIGATION SCHEME ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
0.5% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

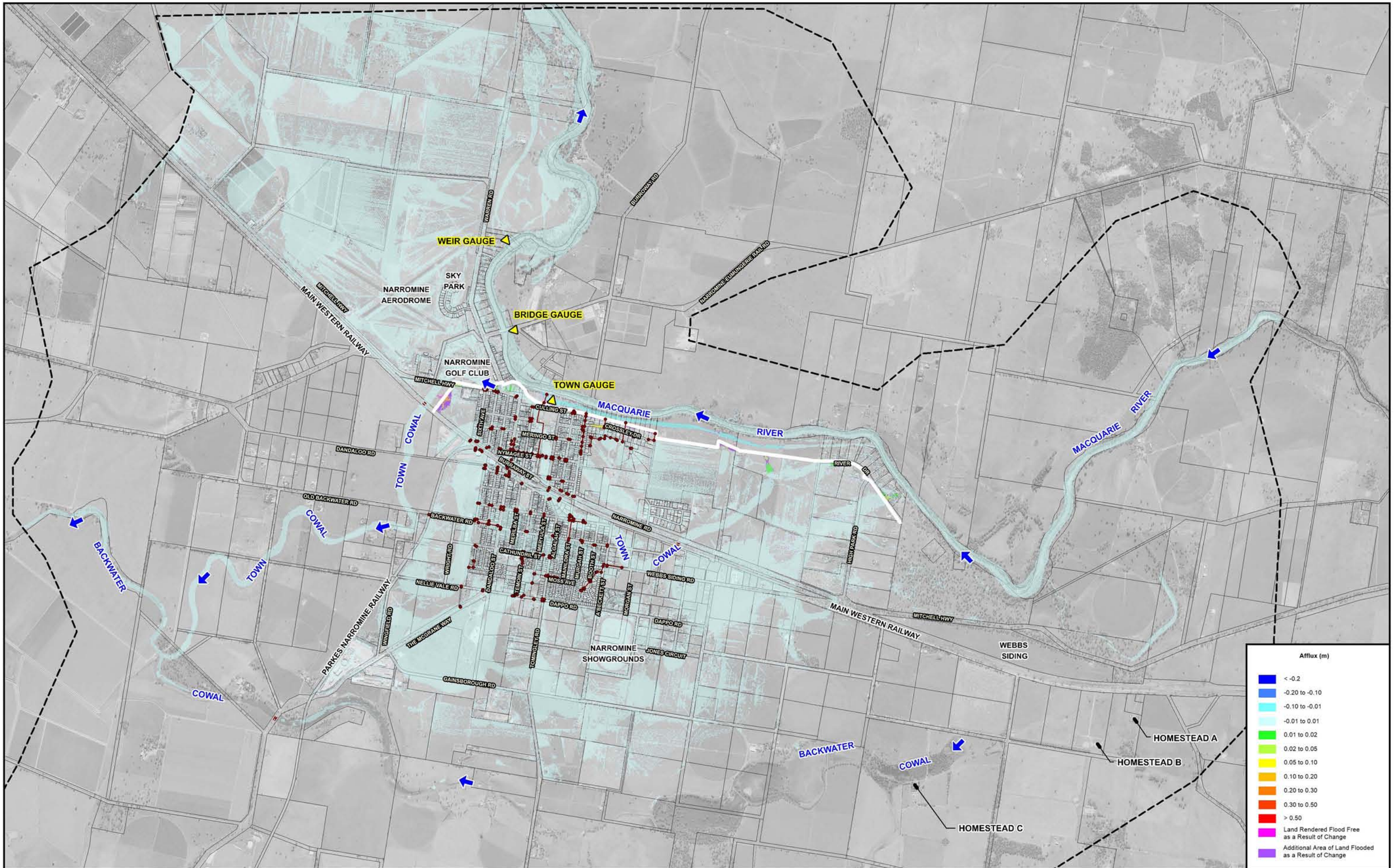
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- 238.5 Water Surface Elevation Contour (m AHD)
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.9

LOCAL CATCHMENT FLOODING – FLOOD GATES FULLY OPEN
POST-PREFERRED FLOOD MITIGATION SCHEME CONDITIONS - 1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

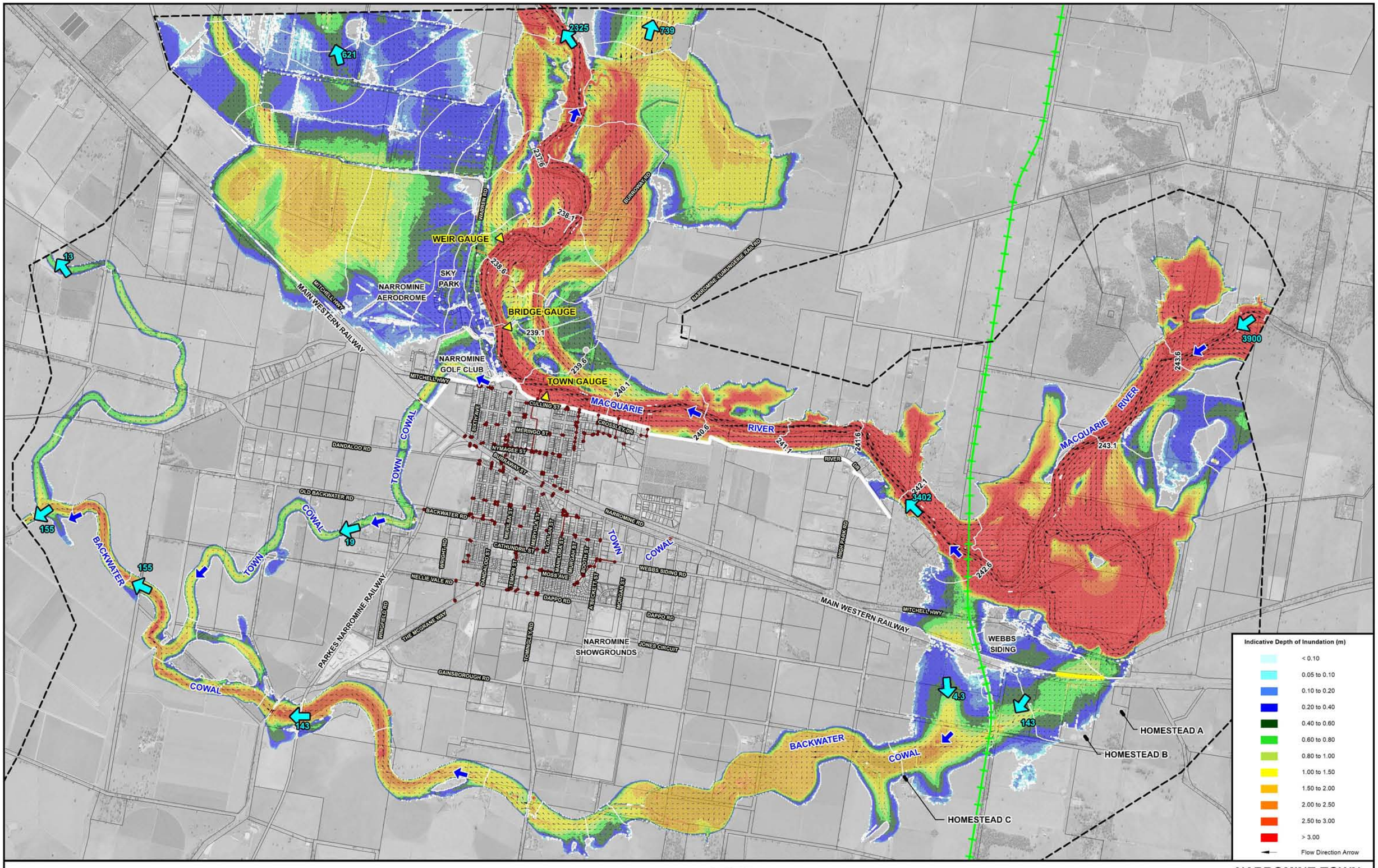
NARROMINE TOWN

FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.10

IMPACT OF ELEVATED RIVER LEVELS ON LOCAL CATCHMENT FLOODING – POST-PREFERRED FLOOD MITIGATION SCHEME CONDITIONS

1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

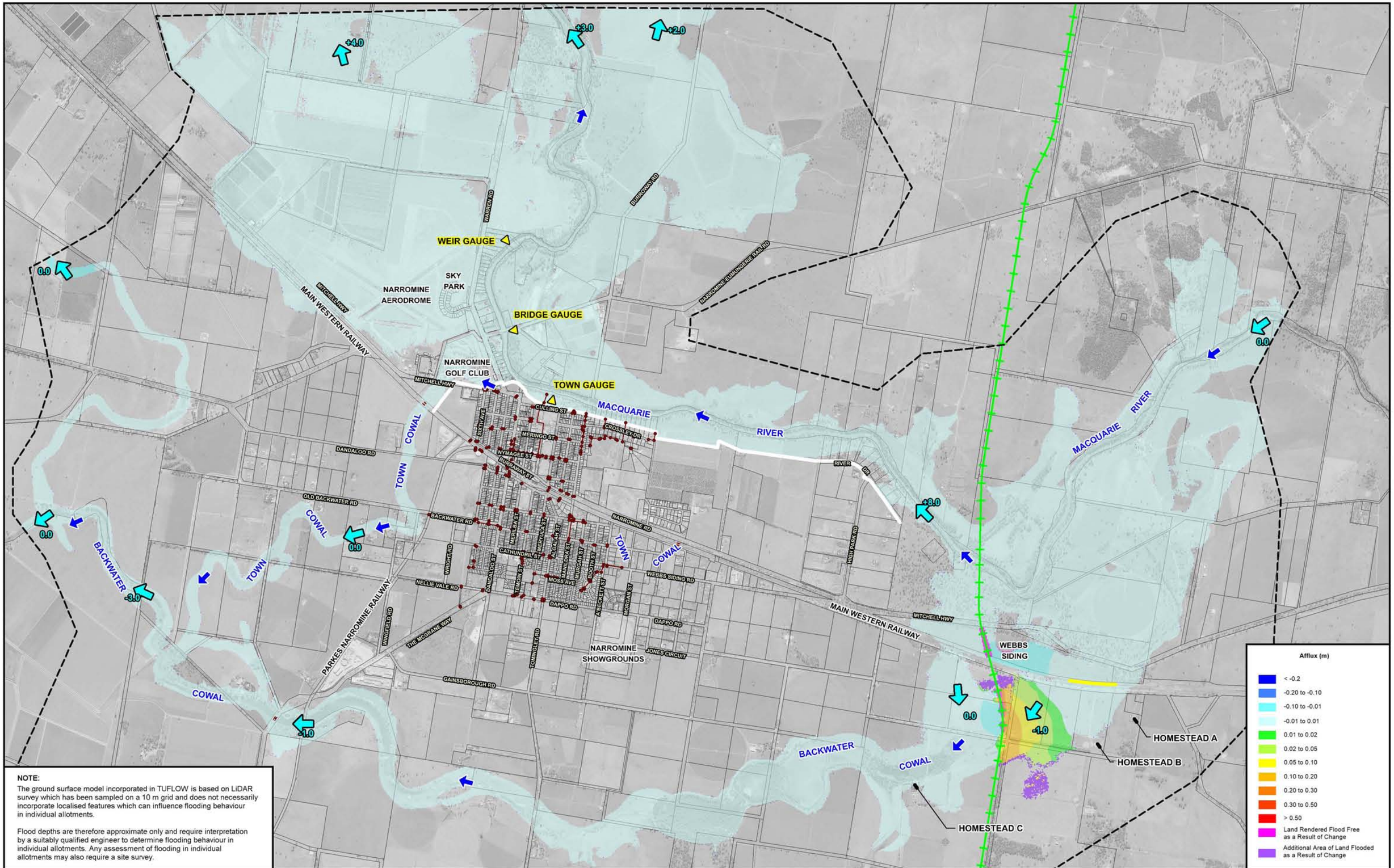
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- 5600 Peak Overland Flow(m^3/s)
- 238.5 Water Surface Elevation Contour (m AHD)
- Proposed Inland Rail Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.11

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING POST-PREFERRED FLOOD MITIGATION SCHEME AND INLAND RAIL PROJECT CONDITIONS - 1% AEP



NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

N

400 0 400 800 1200 m

Scale: 1:40,000

+13 (A positive value represents an increase, and conversely a negative value represents a decrease in peak flow when compared to baseline conditions.)

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade
- Proposed Inland Rail Alignment

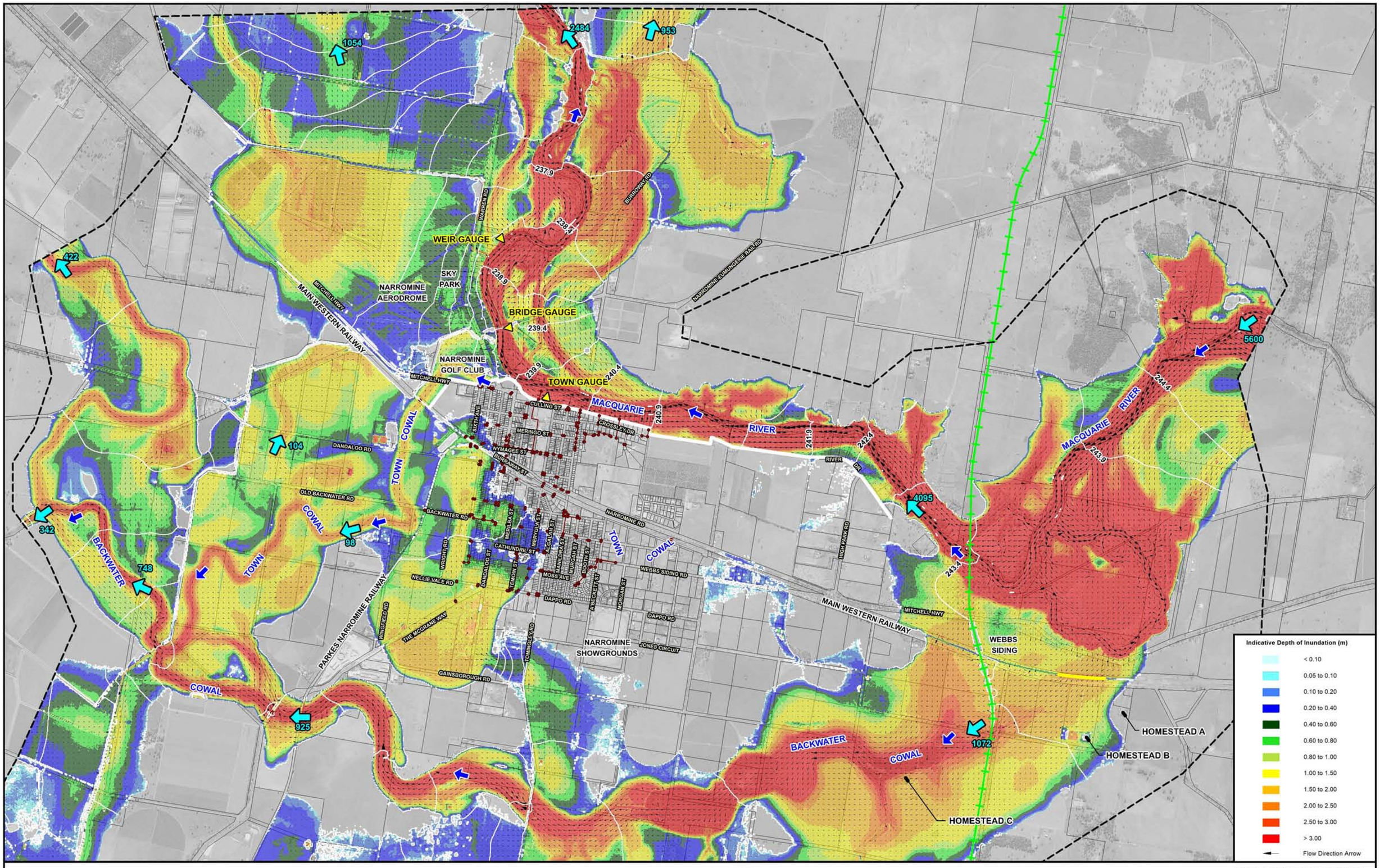
Lyall & Associates

NARROMINE TOWN

FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.12

IMPACT OF INLAND RAIL PROJECT ON FLOOD BEHAVIOUR UNDER POST-PREFERRED FLOOD MITIGATION SCHEME CONDITIONS
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- 5600 Peak Overland Flow(m^3/s)
- 238.5 Water Surface Elevation Contour (m AHD)
- Proposed Inland Rail Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.13

INDICATIVE EXTENT AND DEPTH OF MAIN STREAM FLOODING
POST-PREFERRED FLOOD MITIGATION SCHEME AND INLAND RAIL PROJECT CONDITIONS - 0.5% AEP

+10
+4.0
+5.0
-15
-1.0
-1.0
-2.0
-9.0
-15
-3.0
+30
0.0
WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
HOMESTEAD A
HOMESTEAD B
HOMESTEAD C
MACQUARIE RIVER
COWAL
BACKWATER
TOWN
MAIN WESTERN RAILWAY
NARROMINE-GILGANDRA RAIL RD
WARREN RD
BURROWAY RD
MITCHELL HWY
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
WEBBS SIDING RD
HIGH PARK RD
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURROWAY ST
MERLEWA ST
MERVILLA ST
ALGALA ST
CATHUNDRIL ST
MANILDRA ST
MURGAH ST
EIGHTH ST
ABERCHERT ST
MORGAN ST
MOSS AVE
DAPPO RD
NELLIE VALE RD
WRIGHT RD
DANDALOO ST
KENDAL ST
WINGFIELD RD
THE McGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
PARKES NARROMINE RAILWAY

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

Afflux (m)
- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N
400 0 400 800 1200 m
Scale: 1:40,000

+13
(A positive value represents an increase, and conversely a negative value represents a decrease in peak flow when compared to baseline conditions.)

LEGEND
- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade
- Proposed Inland Rail Alignment

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 3.14

IMPACT OF INLAND RAIL PROJECT ON FLOOD BEHAVIOUR UNDER POST-PREFERRED FLOOD MITIGATION SCHEME CONDITIONS
0.5% AEP

FLOOD EMERGENCY RESPONSE CLASSIFICATIONS

- Extent of Inundation
- Flooded - Isolated - Submerged
- Flooded - Exit Route - Overland Escape
- Flooded - Exit Route - Rising Road

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
HOMESTEAD A
HOMESTEAD B
HOMESTEAD C
MACQUARIE RIVER
COWAL
BACKWATER
TOWN
WARREN RD
BURROWAY RD
NARROMINE-SUMMERDERIE RAILROAD
MAIN WESTERN RAILWAY
MITCHELL HWY
CULLING ST
CROSSLEY DR
MERINGO ST
NYMAGEE ST
BURROWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CATHUNDRIL ST
MOSS AVE
DAPPO RD
WEBBS SIDING RD
NELLIE VALE RD
WINGFIELD RD
THE MOORAME WAY
TOMINGLEY RD
GAINSBOROUGH RD
JONES CIRCUIT
HIGH PARK RD
RIVER DR
PARKES NARROMINE RAILWAY

400 0 400 800 1200 m
Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure 3.15

FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATION
5% AEP

FLOOD EMERGENCY RESPONSE CLASSIFICATIONS

- Extent of Inundation
- Flooded - Isolated - Submerged
- Flooded - Exit Route - Overland Escape
- Flooded - Exit Route - Rising Road

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
HOMESTEAD A
HOMESTEAD B
HOMESTEAD C
MACQUARIE RIVER
COWAL
BACKWATER
TOWN
MAIN WESTERN RAILWAY
PARKES NARROMINE RAILWAY
NARROMINE-GUNNEDAH RAILROAD
MITCHELL HWY
WARREN RD
BURROWAY RD
CULLING ST
MERINGO ST
NYMAGEE ST
BURRAWAY ST
CROSSLEY DR
RIVER DR
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CATHUNDRIL ST
MOSS AVE
DAPPO RD
WEBBS SIDING RD
NELLIE VALE RD
THE MCGRANE WAY
GAINSBOROUGH RD
JONES CIRCUIT
WINGFIELD RD
TOMINGLEY RD
HIGH PARK RD
SIXTH AVE
MERILBA ST
MERYULA ST
ALGALAH ST
MANILDRA ST
WURGAN ST
BOOTH ST
ABERCAIRN ST
MORGAN ST
WRIGHT RD
FERGANS ST

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.16

FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATION
1% AEP

FLOOD EMERGENCY RESPONSE CLASSIFICATIONS

- Extent of Inundation
- Flooded - Isolated - Submerged
- Flooded - Isolated - Elevated

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
HOMESTEAD A
HOMESTEAD B
HOMESTEAD C
MACQUARIE RIVER
COWAL
BACKWATER
TOWN
WARREN RD
BURROWAY RD
NARROMINE-GUNDONGERIE RAIL RD
MAIN WESTERN RAILWAY
MITCHELL HWY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
MERILBA ST
MERYULA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
CATHUNDRIL ST
DANDALOO ST
FEMAIN ST
MOSS AVE
ASHCROFT ST
MORGAN ST
DAPPO RD
WEBBS SIDING RD
HIGH PARK RD
RIVER DR
WRIGHT RD
NELLIE VALE RD
WINGFIELD RD
THE MCGRANE WAY
PARKES NARROMINE RAILWAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Town Levee

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure 3.17

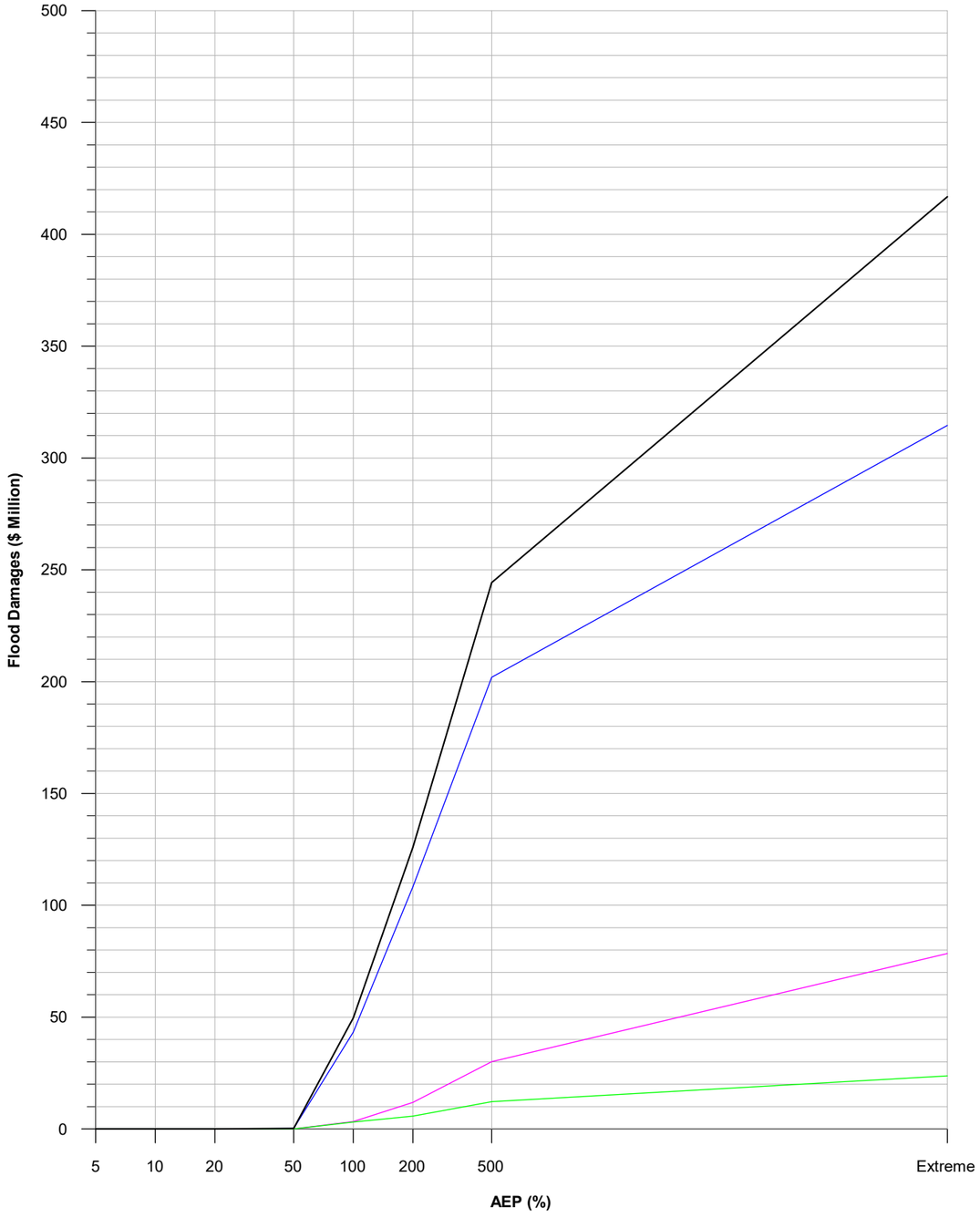
FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATION
EXTREME FLOOD

APPENDIX B

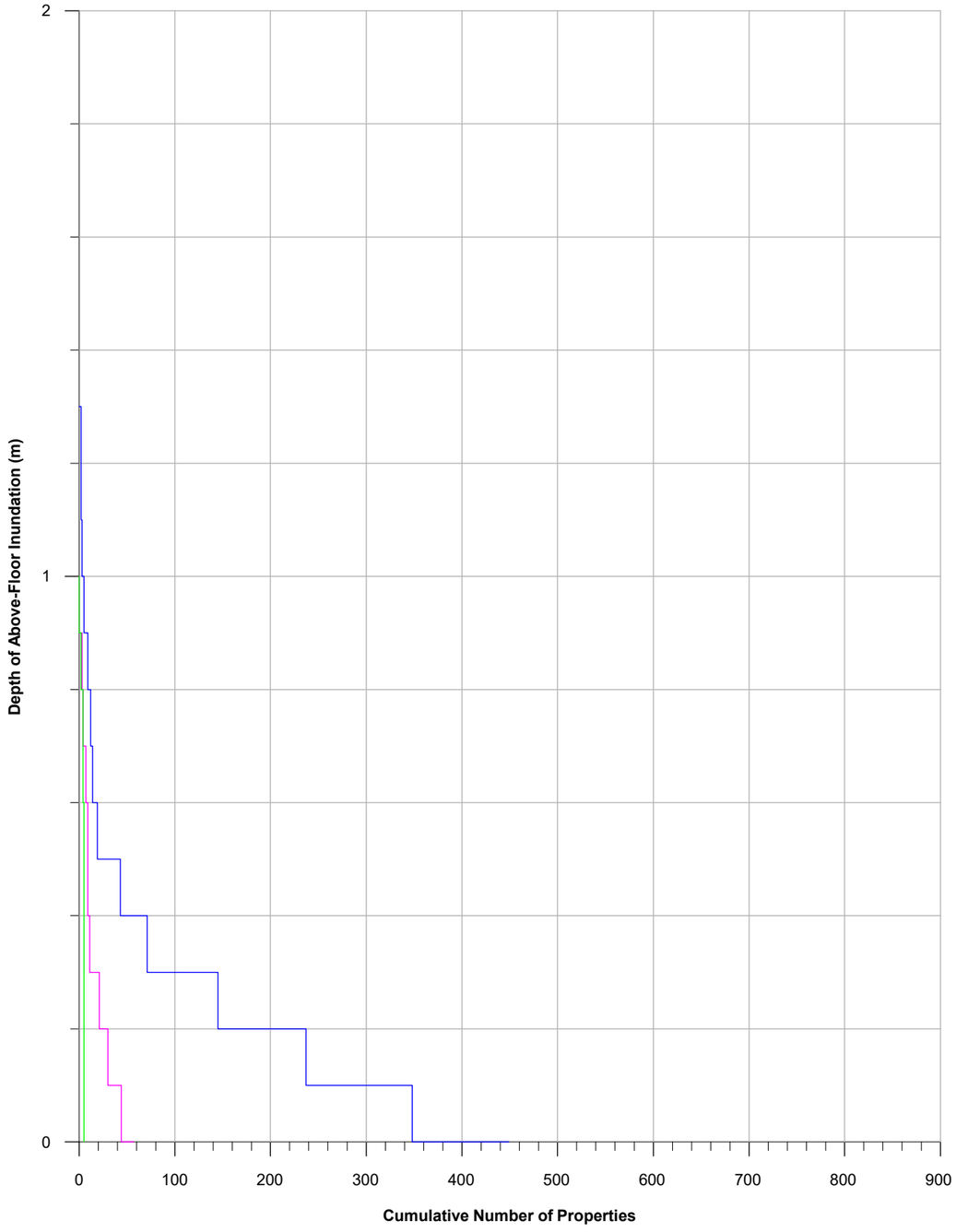
FLOOD DAMAGES

LIST OF FIGURES (APPENDIX B)

DAMAGE FREQUENCY CURVE



CUMULATIVE FLOODED PROPERTIES VERSUS DEPTH OF INUNDATION DIAGRAM - 1% AEP



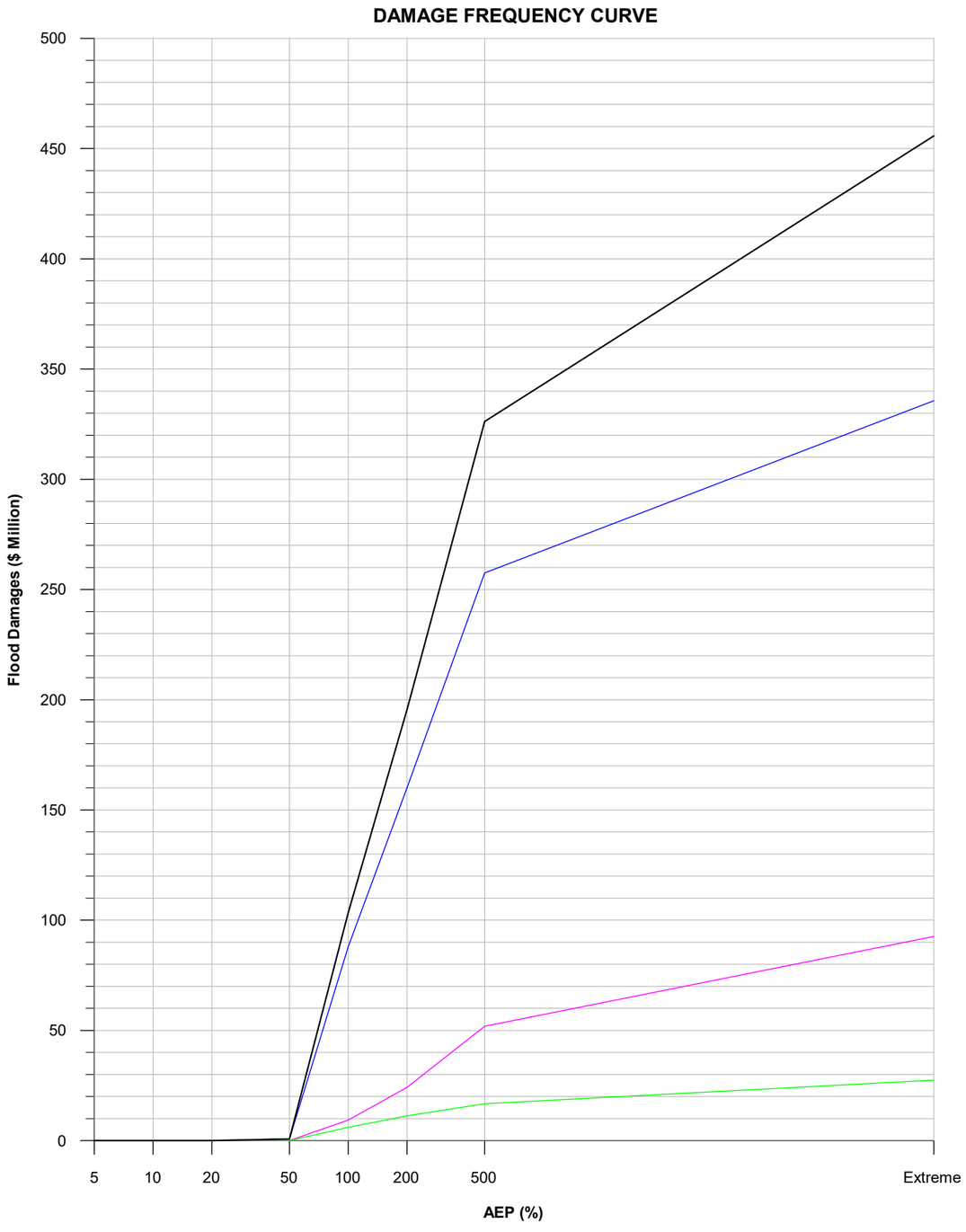
LEGEND
- Total
- Residential
- Commercial
- Public

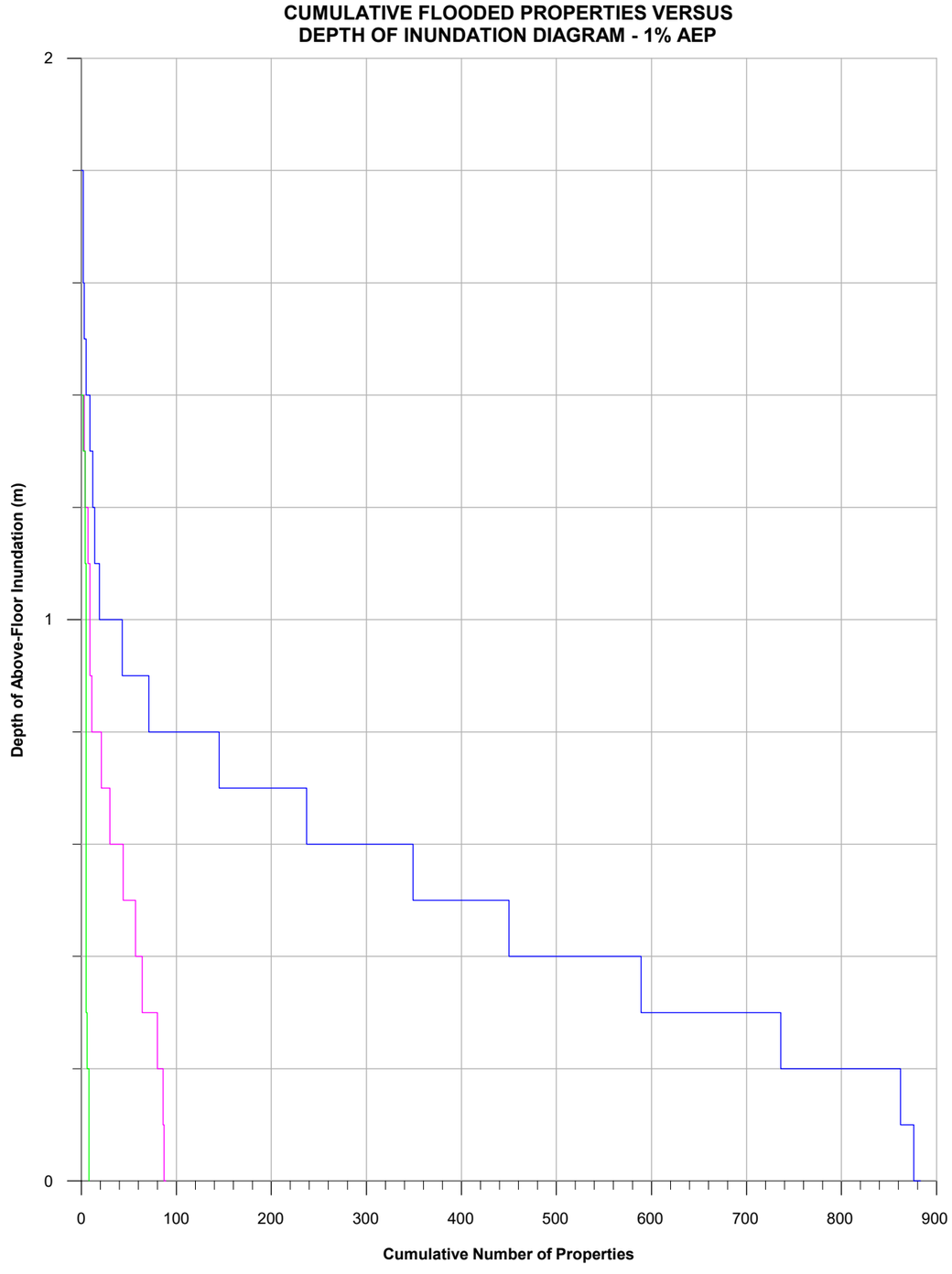
Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure B8.1

DAMAGE - FREQUENCY CURVES AND
CUMULATIVE FLOODED PROPERTIES VERSUS DEPTH OF INUNDATION DIAGRAM
1% AEP NOMINAL FLOOD LEVELS





LEGEND
- Total
- Residential
- Commercial
- Public

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure B8.2

DAMAGE - FREQUENCY CURVES AND
CUMULATIVE FLOODED PROPERTIES VERSUS DEPTH OF INUNDATION DIAGRAM
1% AEP NOMINAL FLOOD LEVELS WITH FREEBOARD

APPENDIX C

IMPACT OF ASSESSED RIVER BANK LEVEE OPTIONS ON FLOOD BEHAVIOUR

LIST OF FIGURES (APPENDIX C)

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-GUNUNGBRIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
WRIGHT RD
MERRIWA ST
ALGALAH ST
CATHUNDRIL ST
MANILDRA ST
MORGAN ST
BOOTH ST
TEMORA ST
DANDALOO ST
MOSS AVE
ABERCRETT ST
NELLIE VALE RD
DAPPO RD
WEBBS SIDING RD
HIGH PARK RD
RIVER DR
PARKES NARROMINE RAILWAY
WINGFIELD RD
THE MOGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
COWAL
TOWN
BACKWATER
MACQUARIE RIVER

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.1

IMPACT OF LEVEE OPTION B ON MAIN STREAM FLOODING
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUNUNDGERIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
NARROMINE RD
MERILBA ST
MERVILLA ST
ALGALAH ST
CATHUNDRIL ST
MANILDRA ST
MURGAH ST
BOOTH ST
ARELCHEM ST
MORGAN ST
DANDALOO ST
LEMAN ST
MOSS AVE
DAPPO RD
WEBBS SIDING RD
HIGH PARK RD
JONES CIRCUIT
TOMINGLEY RD
WRIGHT RD
WINGFIELD RD
THE McGRANE WAY
NELLIE VALE RD
PARKES NARROMINE RAILWAY
GAINSBOROUGH RD
OLD BACKWATER RD
BACKWATER RD
DANDALOO RD
RIVER DR
MACQUARIE RIVER
COWAL
TOWN
BACKWATER

Velocity Afflux (m/s)

- < -0.50
- -0.50 to -0.20
- -0.20 to -0.10
- -0.10 to -0.05
- -0.05 to 0.05
- 0.05 to 0.10
- 0.10 to 0.15
- 0.15 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

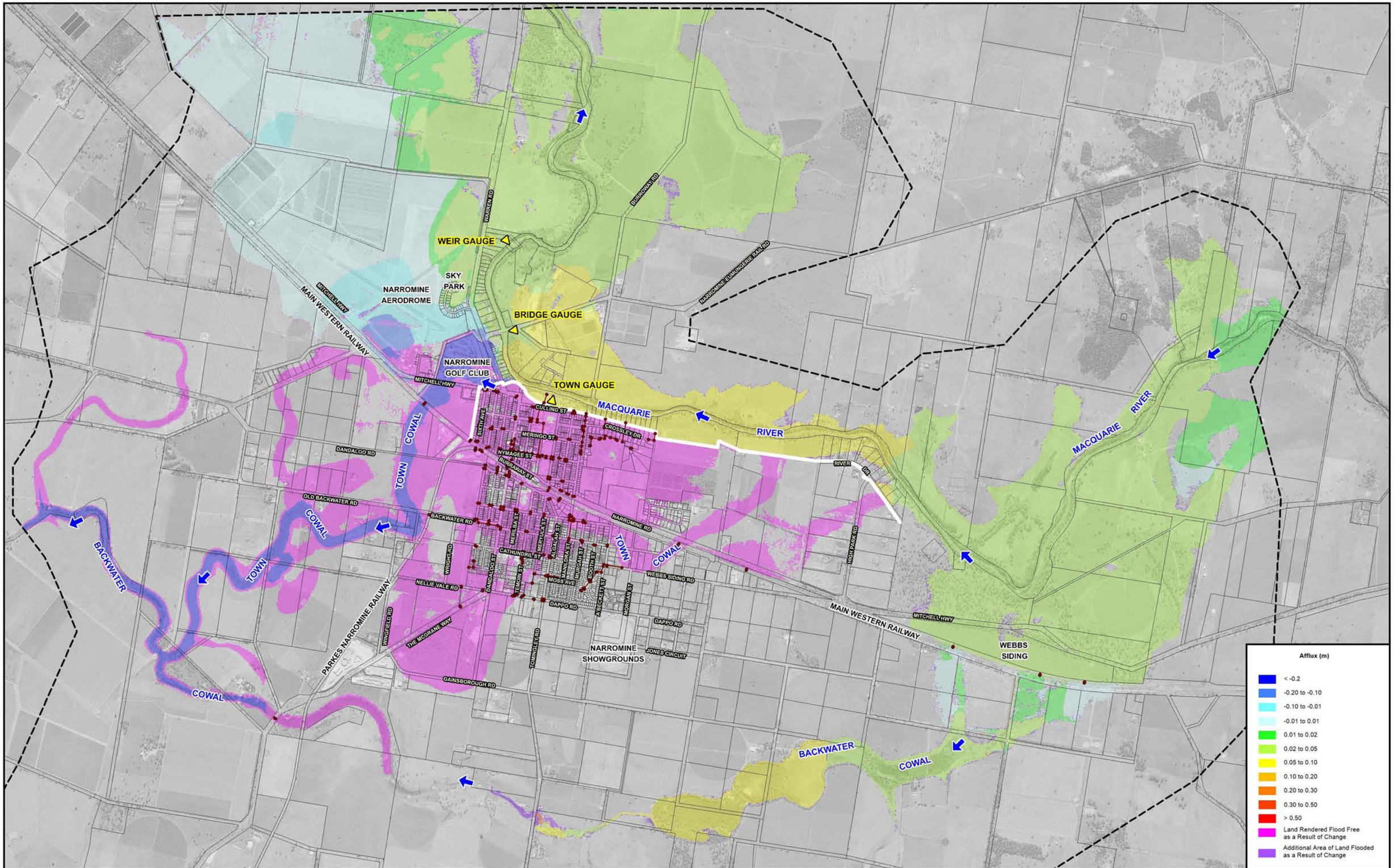
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.2

IMPACT OF LEVEE OPTION B ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.3

IMPACT OF LEVEE OPTION B1 ON MAIN STREAM FLOODING
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUNUNGERIE RAIL RD
MAIN WESTERN RAILWAY
MITCHELL HWY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
MERILBA ST
MERVULA ST
CATHUNDRIL ST
ALGALAH ST
MAIN PARK ST
MURGAH ST
BOOTH ST
ADELAIDE ST
MORGAN ST
MOSS AVE
KEMORE ST
DANDALOO ST
WRIGHT RD
NELLIE VALE RD
DAPPO RD
WINGFIELD RD
THE MCGRANE WAY
TOMINGLEY RD
GAINSBOROUGH RD
PARKES NARROMINE RAILWAY
WEBBS SIDING RD
HIGH PARK RD
JONES CIRCUIT
RIVER DR
MACQUARIE RIVER
COWAL
TOWN
BACKWATER

Velocity Afflux (m/s)

- < -0.50
- -0.50 to -0.20
- -0.20 to -0.10
- -0.10 to -0.05
- -0.05 to 0.05
- 0.05 to 0.10
- 0.10 to 0.15
- 0.15 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

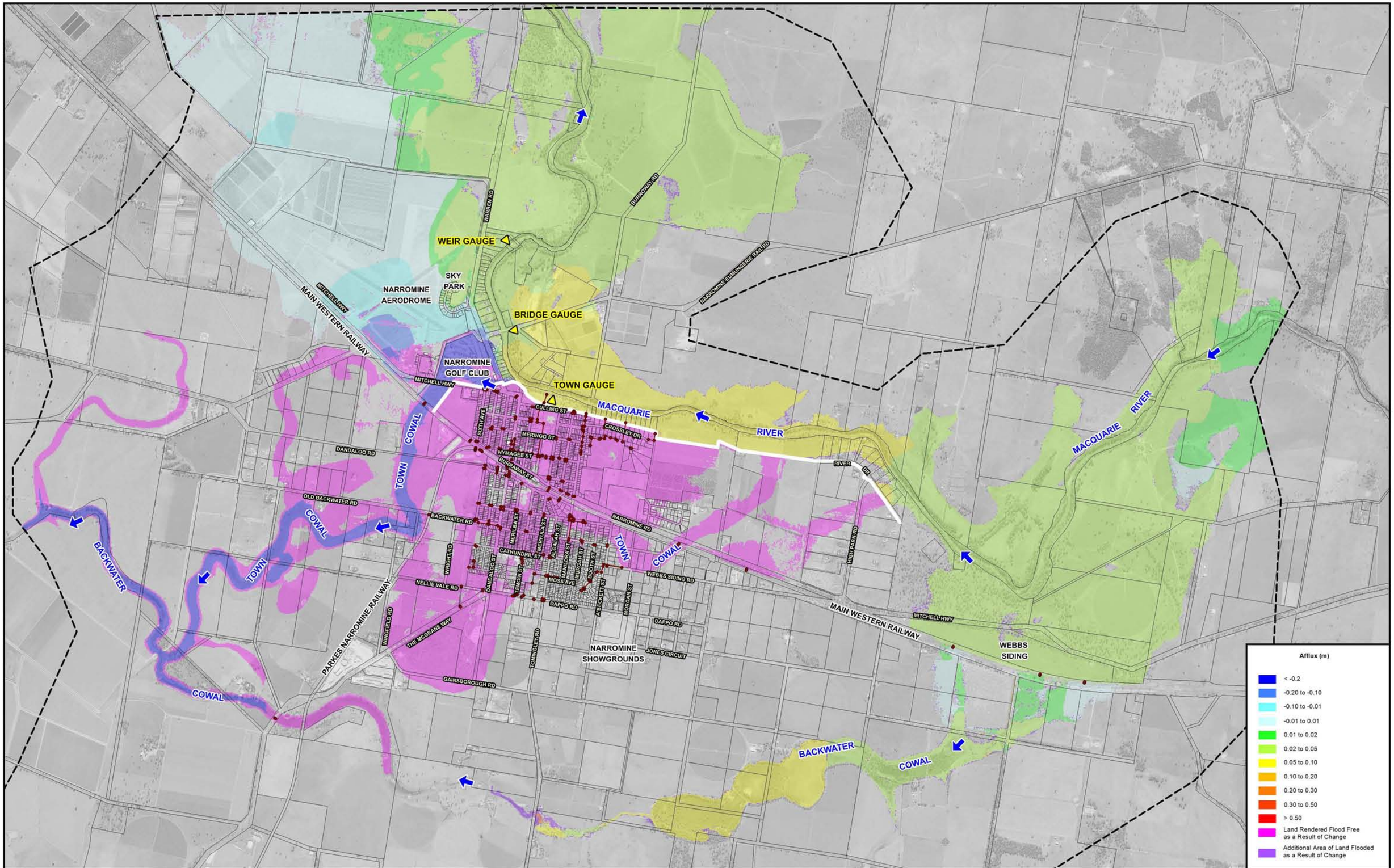
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.4

IMPACT OF LEVEE OPTION B1 ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

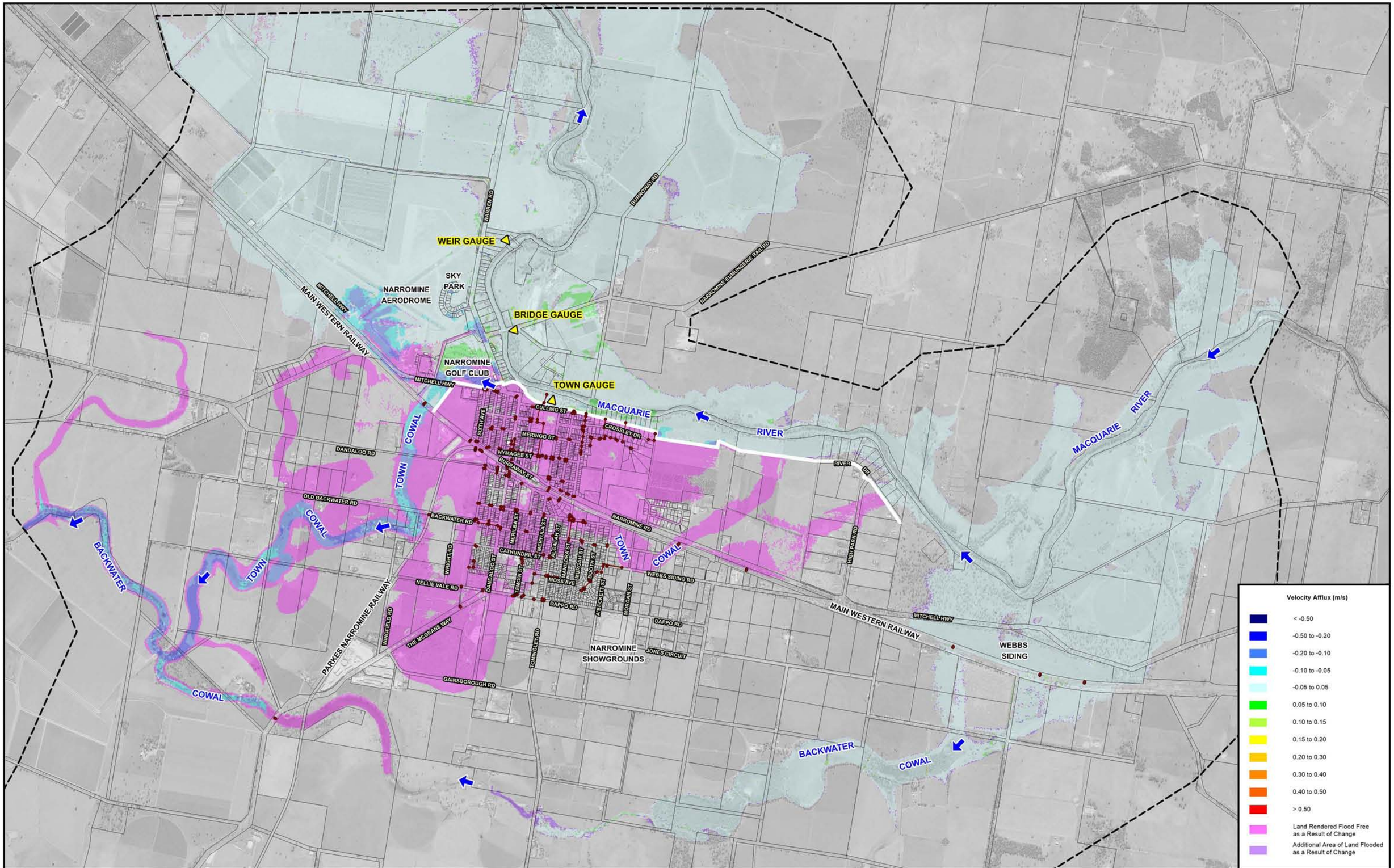
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.5

IMPACT OF LEVEE OPTION B1A ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

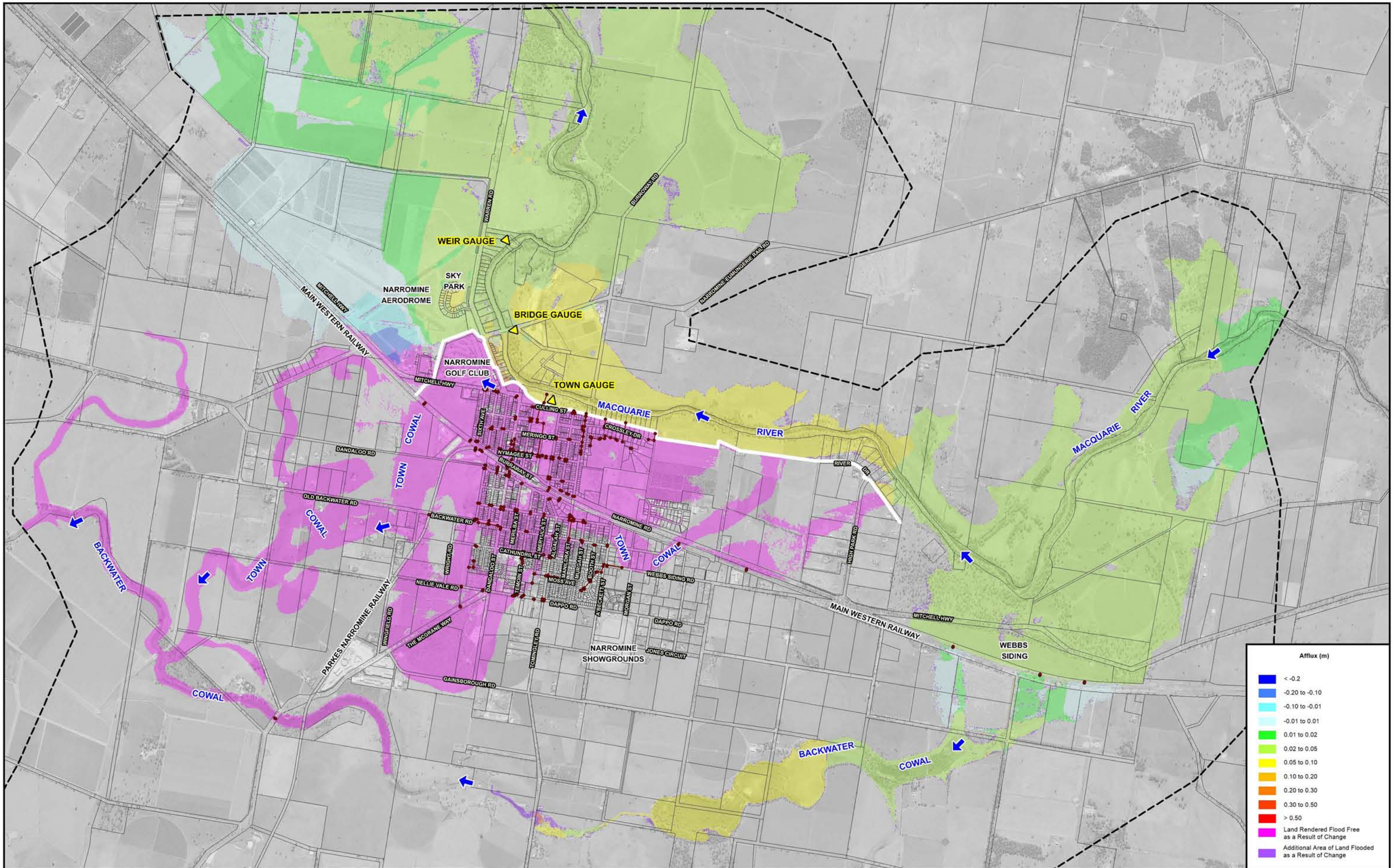
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.6

IMPACT OF LEVEE OPTION B1A ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

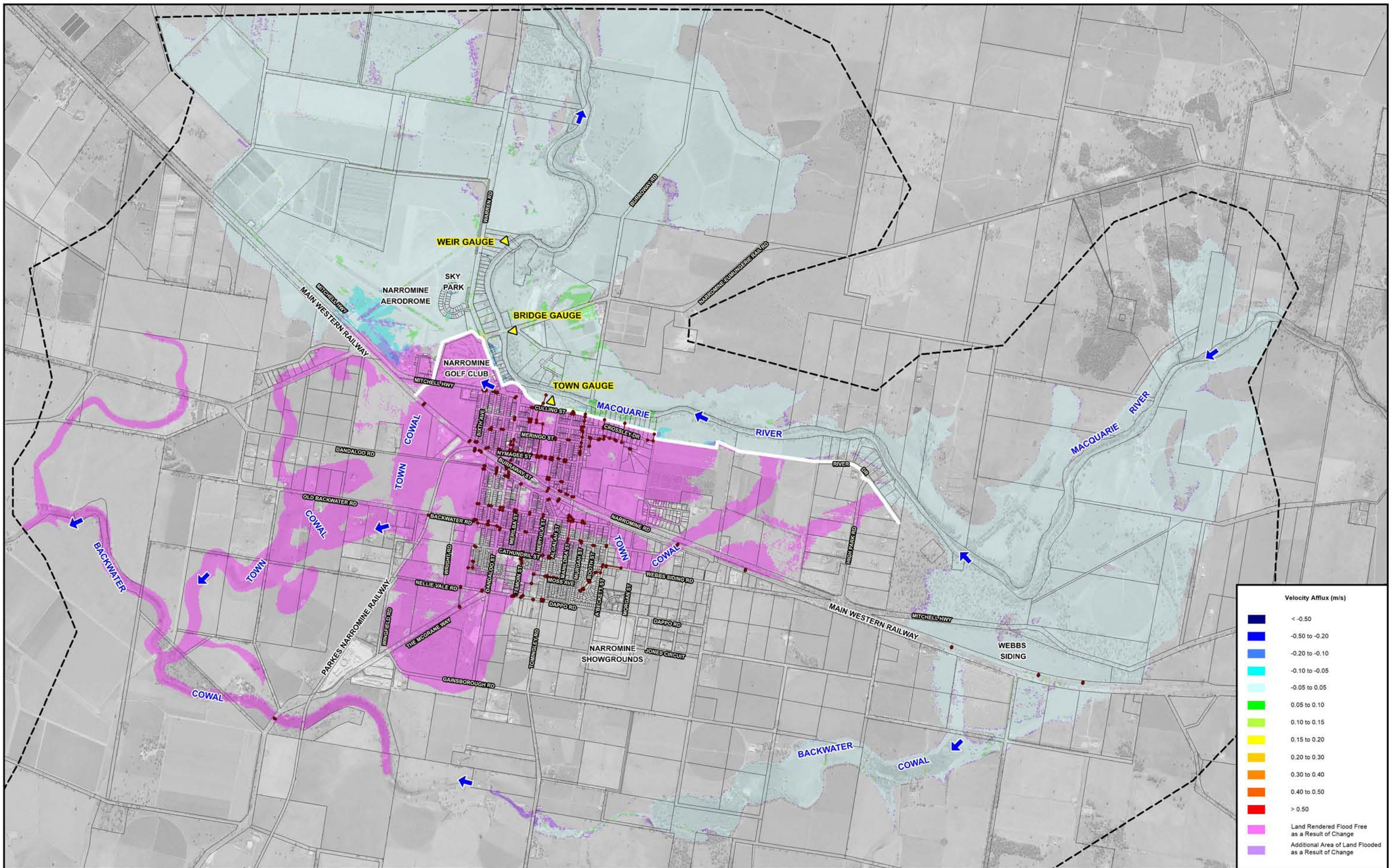
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.7

IMPACT OF LEVEE OPTION B2 ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

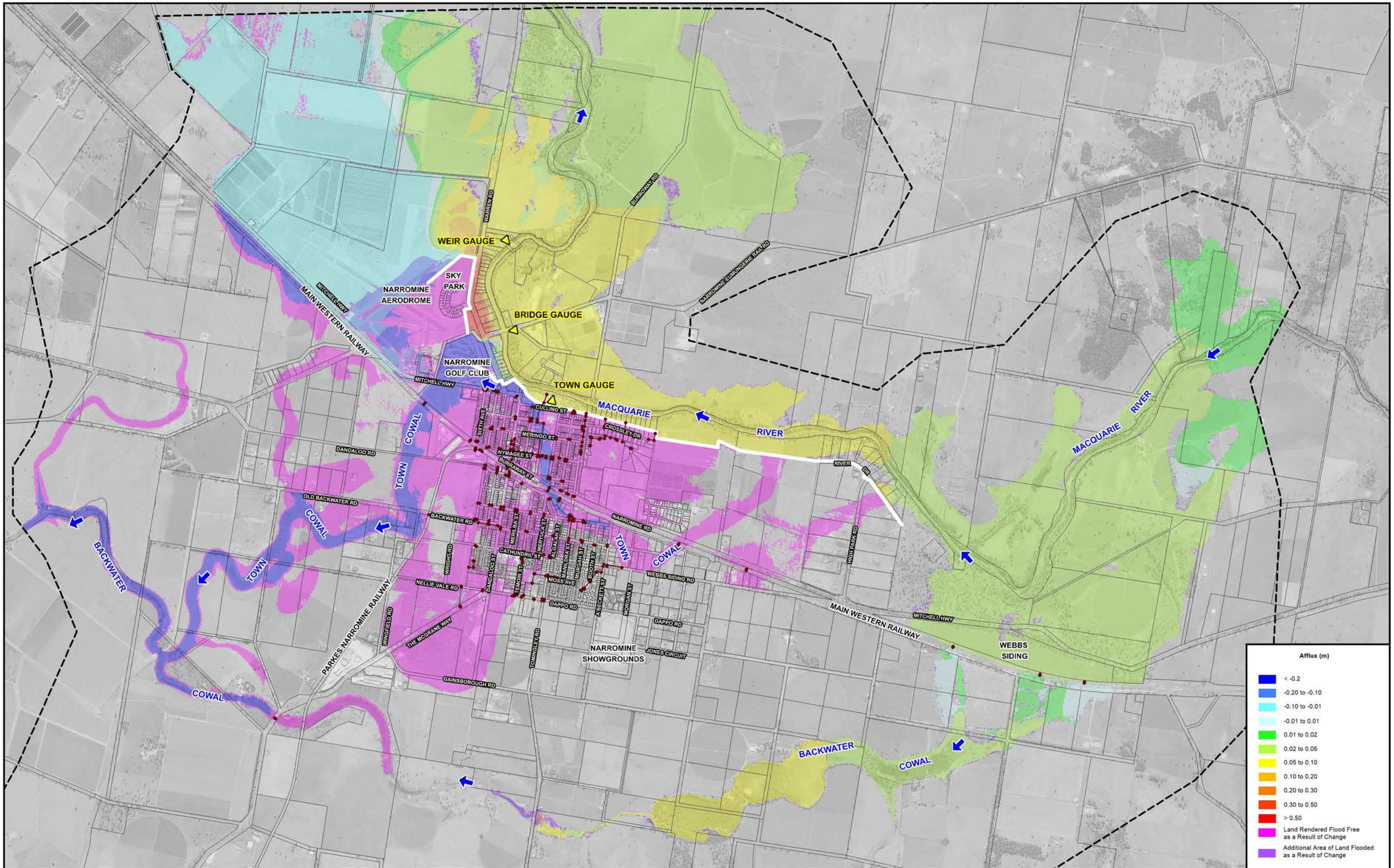
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.8

IMPACT OF LEVEE OPTION B2 ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

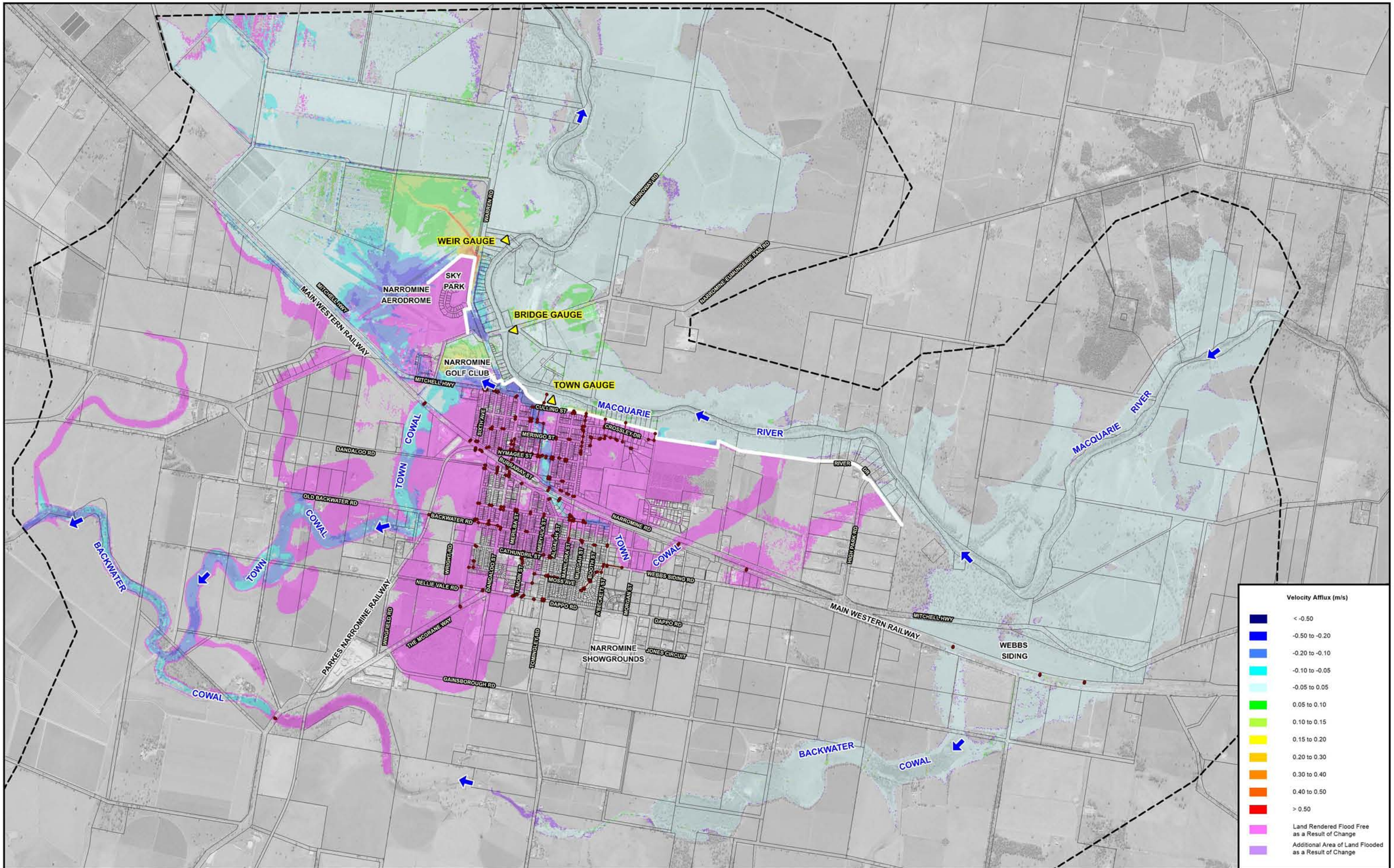
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.9

IMPACT OF LEVEE OPTION Ha ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.10

IMPACT OF LEVEE OPTION Ha ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUMMERDERIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURROWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CATHUNDRIL ST
MERRIBA ST
MERRILLA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
ASBESKELT ST
MORGAN ST
TERRON ST
MOSS AVE
WRIGHT RD
NELLIE VALE RD
DAPPO RD
WINGFIELD RD
THE MOGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
WEBBS SIDING RD
HIGH PARK RD
RIVER DR
PARKES NARROMINE RAILWAY
MACQUARIE RIVER
COWAL
TOWN
BACKWATER

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.11

IMPACT OF LEVEE OPTION B WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-GUNUNGBERIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CATHUNDRIL ST
MOSS AVE
DAPPO RD
WEBBS SIDING RD
NELLIE VALE RD
WINGFIELD RD
THE MCGRANE WAY
GAINSBOROUGH RD
TOMINGLEY RD
JONES CIRCUIT
HIGH PARK RD
RIVER DR
PARKES NARROMINE RAILWAY
MACQUARIE RIVER
TOWN COWAL
BACKWATER
COWAL

Velocity Afflux (m/s)

- < -0.50
- -0.50 to -0.20
- -0.20 to -0.10
- -0.10 to -0.05
- -0.05 to 0.05
- 0.05 to 0.10
- 0.10 to 0.15
- 0.15 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.12

IMPACT OF LEVEE OPTION B WITH RAILWAY CULVERT UPGRADE ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
MACQUARIE RIVER
COWAL
BACKWATER
TOWN COWAL
MAIN WESTERN RAILWAY
PARKES NARROMINE RAILWAY
NARROMINE-GUNUNGBRIE RAIL RD
WARREN RD
BURROWAY RD
MITCHELL HWY
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
RIVER DR
WRIGHT RD
MERRIJIA ST
ALGALAH ST
CATHUNDRIL ST
MURGAH ST
BOOTH ST
TEMON ST
MOSS AVE
DANDALOO ST
NELLIE VALE RD
DAPPO RD
ASBESKET ST
MORGAN ST
WINGFIELD RD
THE MOGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
WEBBS SIDING RD
HIGH PARK RD

Afflux (m)
- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

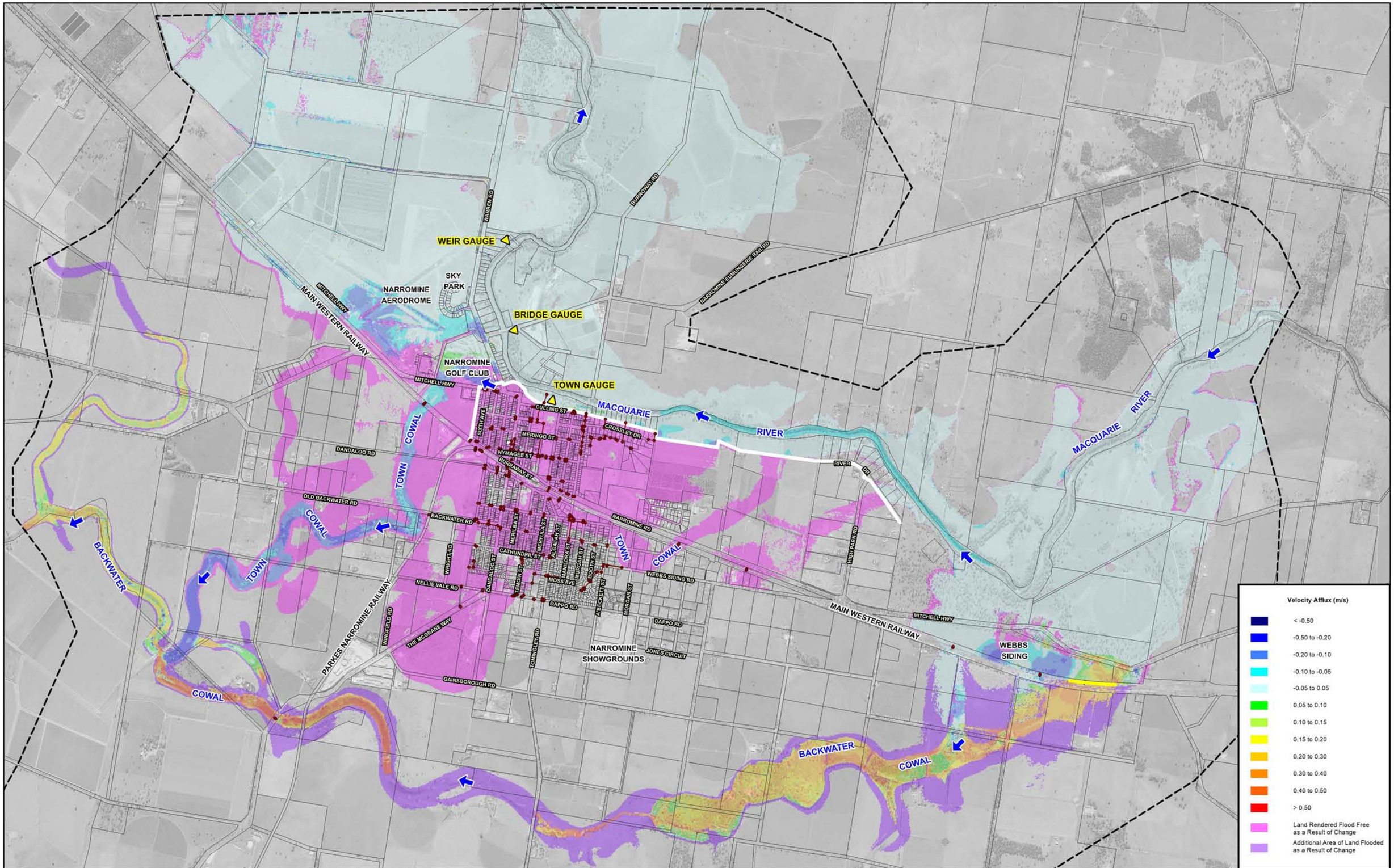
- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.13

IMPACT OF LEVEE OPTION B1 WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.14

IMPACT OF LEVEE OPTION B1 WITH RAILWAY CULVERT UPGRADE ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUNUNGERIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
MACQUARIE RIVER
RIVER DR
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
WRIGHT RD
MERRIJIA ST
ALGALAH ST
CATHUNDRIL ST
MANILDRA ST
MURGAH ST
BOOTH ST
TEMON ST
MOSS AVE
ASBESKET ST
MORGAN ST
DANDALOO ST
NELLIE VALE RD
DAPPO RD
WINGFIELD RD
THE MOGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
HIGH PARK RD
WEBBS SIDING RD
PARKES NARROMINE RAILWAY
TOWN COWAL
BACKWATER
COWAL

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

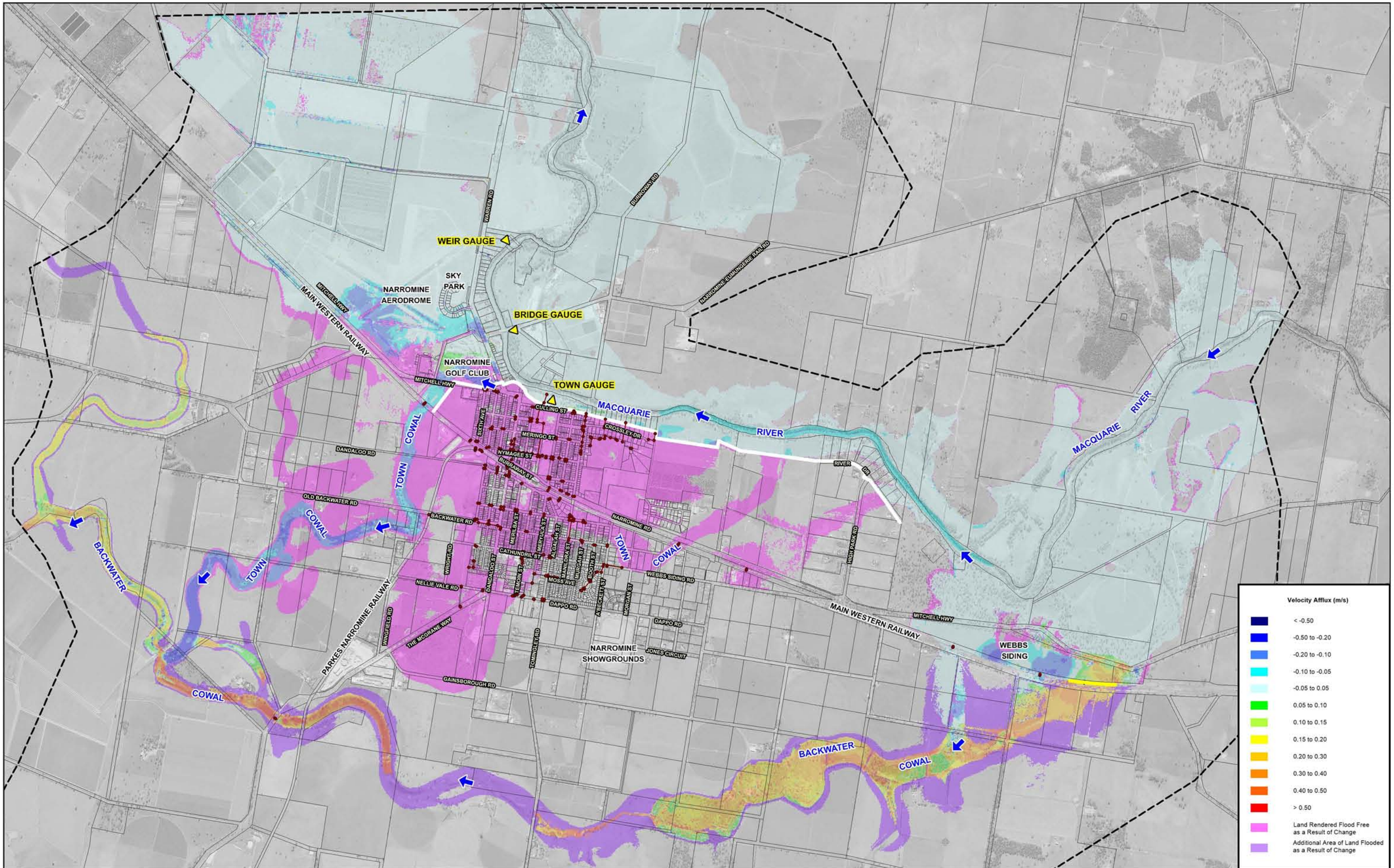
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.15

IMPACT OF LEVEE OPTION B1A WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.16

IMPACT OF LEVEE OPTION B1A WITH RAILWAY CULVERT UPGRADE ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUNUNGBRIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
COWAL TOWN
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
MACQUARIE RIVER
RIVER DR
MERRIJIA ST
ALGALAH ST
CATHUNDRIL ST
MURGAH ST
BOOTH ST
TEMON ST
MOSS AVE
ASKEKET ST
WRIGHT RD
NELLIE VALE RD
WINGFIELD RD
THE MOGRANE WAY
PARKES NARROMINE RAILWAY
TOMINGLEY RD
DAPPO RD
MORGAN ST
JONES CIRCUIT
GAINSBOROUGH RD
WEBBS SIDING RD
HIGH PARK RD
BACKWATER
COWAL

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

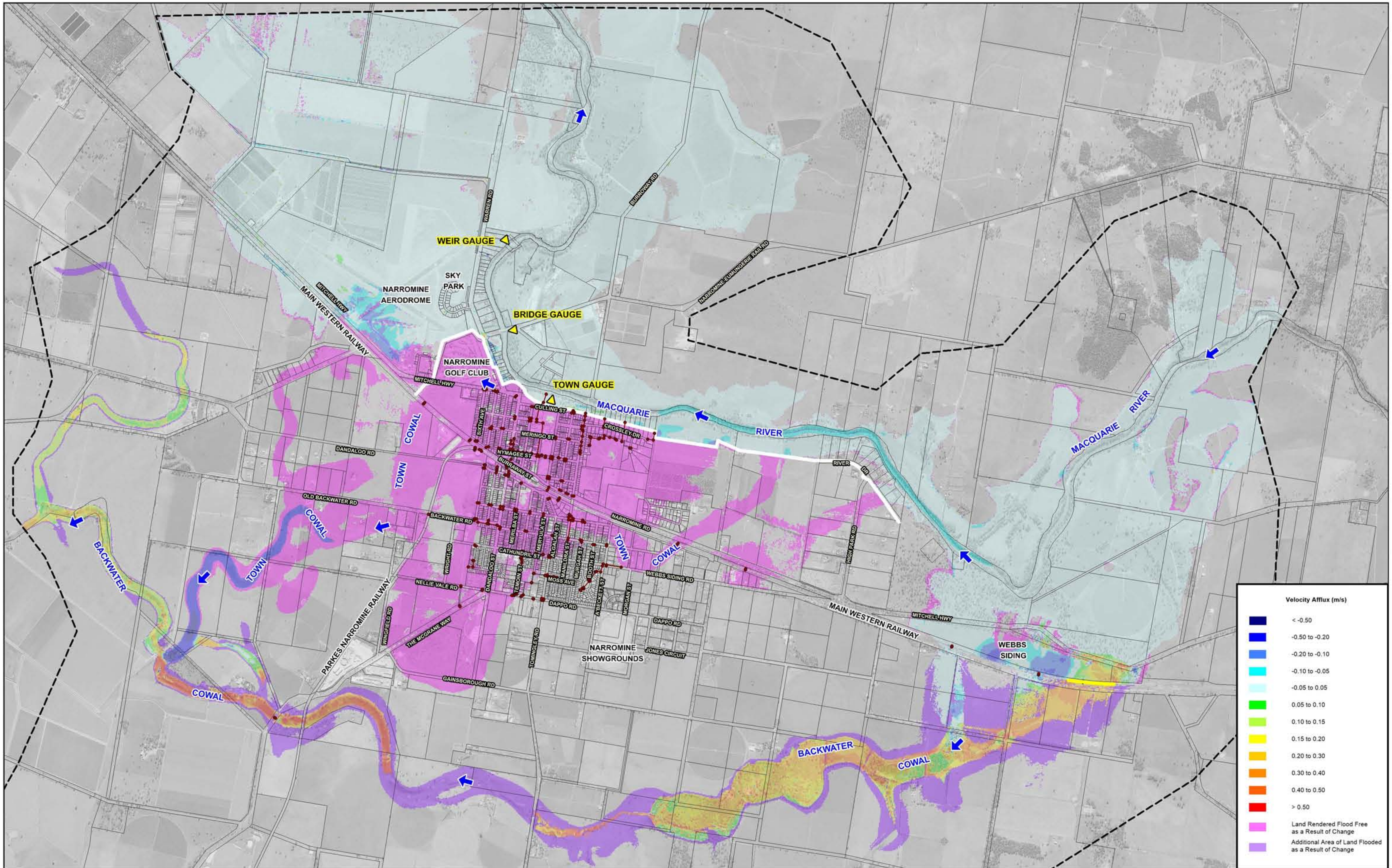
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.17

IMPACT OF LEVEE OPTION B2 WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.18

IMPACT OF LEVEE OPTION B2 WITH RAILWAY CULVERT UPGRADE ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
NARROMINE AERODROME
SKY PARK
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUNUNGERIE RAIL RD
MITCHELL HWY
MAIN WESTERN RAILWAY
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURRAWAY ST
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
WRIGHT RD
MERRIBA ST
MERRULA ST
ALGALAH ST
CATHUNDRIL ST
DANDALOO ST
TEMON ST
MANILDRA ST
MURGAH ST
BOOTH ST
MOSS AVE
ASBESKET ST
MORGAN ST
DAPPO RD
WEBBS SIDING RD
HIGH PARK RD
NELLIE VALE RD
WINGFIELD RD
THE MOGRANE WAY
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD
PARKES NARROMINE RAILWAY
RIVER DR
MACQUARIE RIVER
COWAL TOWN
BACKWATER
COWAL

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

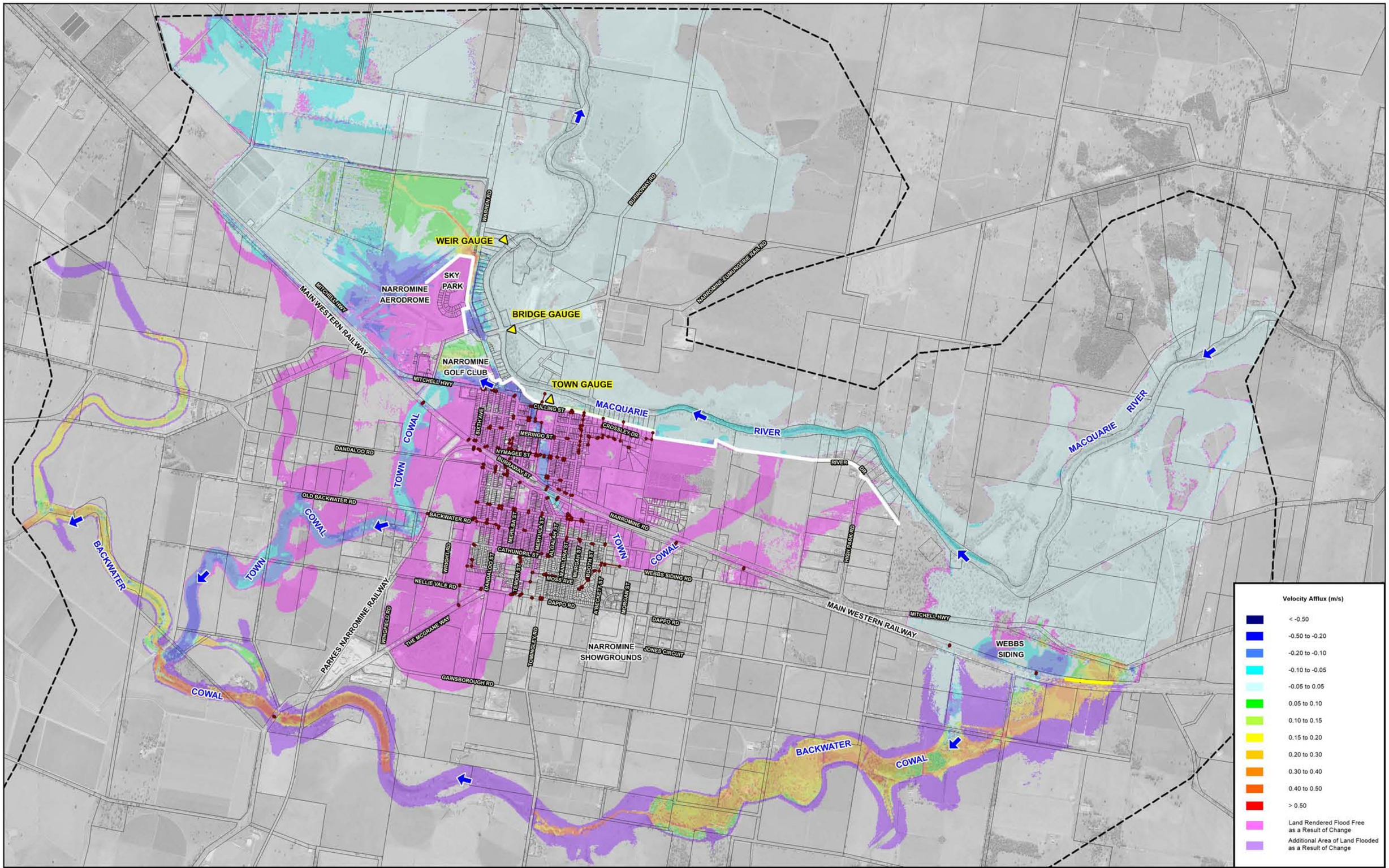
LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.19

IMPACT OF LEVEE OPTION Ha WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

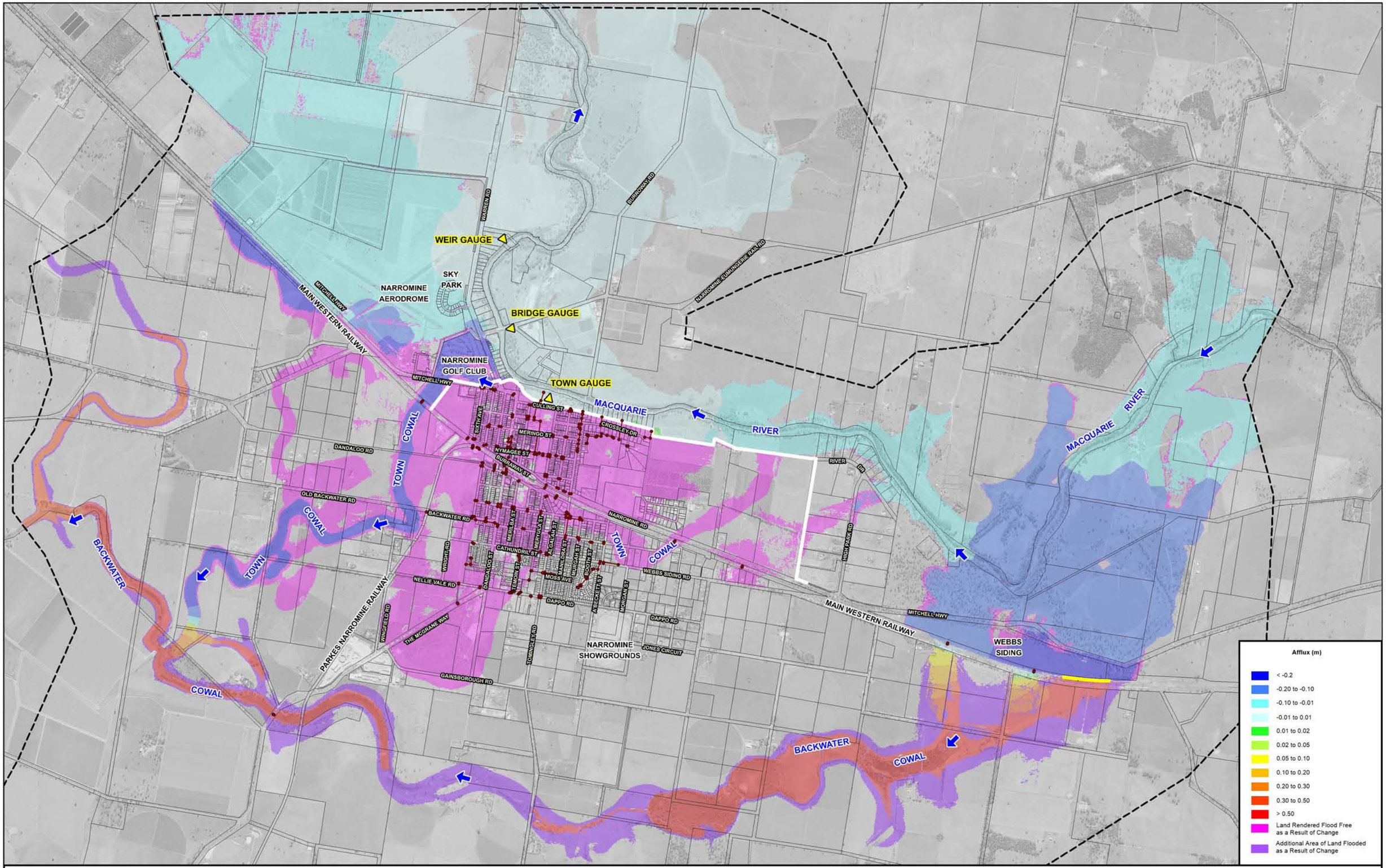
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

Two-Dimensional Model Boundary
Modelled Stormwater Drainage System
Stream Gauge
Proposed Levee Alignment
Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.20

IMPACT OF LEVEE OPTION Ha WITH RAILWAY CULVERT UPGRADE ON MAXIMUM MAIN STREAM FLOODING FLOW VELOCITIES
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.21

IMPACT OF LEVEE OPTION B1B WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP

WEIR GAUGE
BRIDGE GAUGE
TOWN GAUGE
SKY PARK
NARROMINE AERODROME
NARROMINE GOLF CLUB
NARROMINE SHOWGROUNDS
WEBBS SIDING
WARREN RD
BURROWAY RD
NARROMINE-SUNUNGERIE RAIL RD
MAIN WESTERN RAILWAY
MITCHELL HWY
MACQUARIE RIVER
COWAL
BACKWATER
TOWN COWAL
DANDALOO RD
OLD BACKWATER RD
BACKWATER RD
NARROMINE RD
CULLING ST
SIXTH AVE
MERINGO ST
CROSSLEY DR
NYMAGEE ST
BURROWAY ST
RIVER DR
HIGH PARK RD
WEBBS SIDING RD
CATHUNDRIL ST
MERRIBA ST
MERRILLA ST
ALGALAH ST
MANILDRA ST
MURGAH ST
BOOTH ST
TEMON ST
MOSS AVE
DANDALOO ST
NELLIE VALE RD
WRIGHT RD
WINGFIELD RD
THE MOGRANE WAY
PARKES NARROMINE RAILWAY
DAPPO RD
ASBESKEILT ST
MORGAN ST
TOMINGLEY RD
JONES CIRCUIT
GAINSBOROUGH RD

Afflux (m)

- < -0.2
- -0.20 to -0.10
- -0.10 to -0.01
- -0.01 to 0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.50
- > 0.50
- Land Rendered Flood Free as a Result of Change
- Additional Area of Land Flooded as a Result of Change

N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

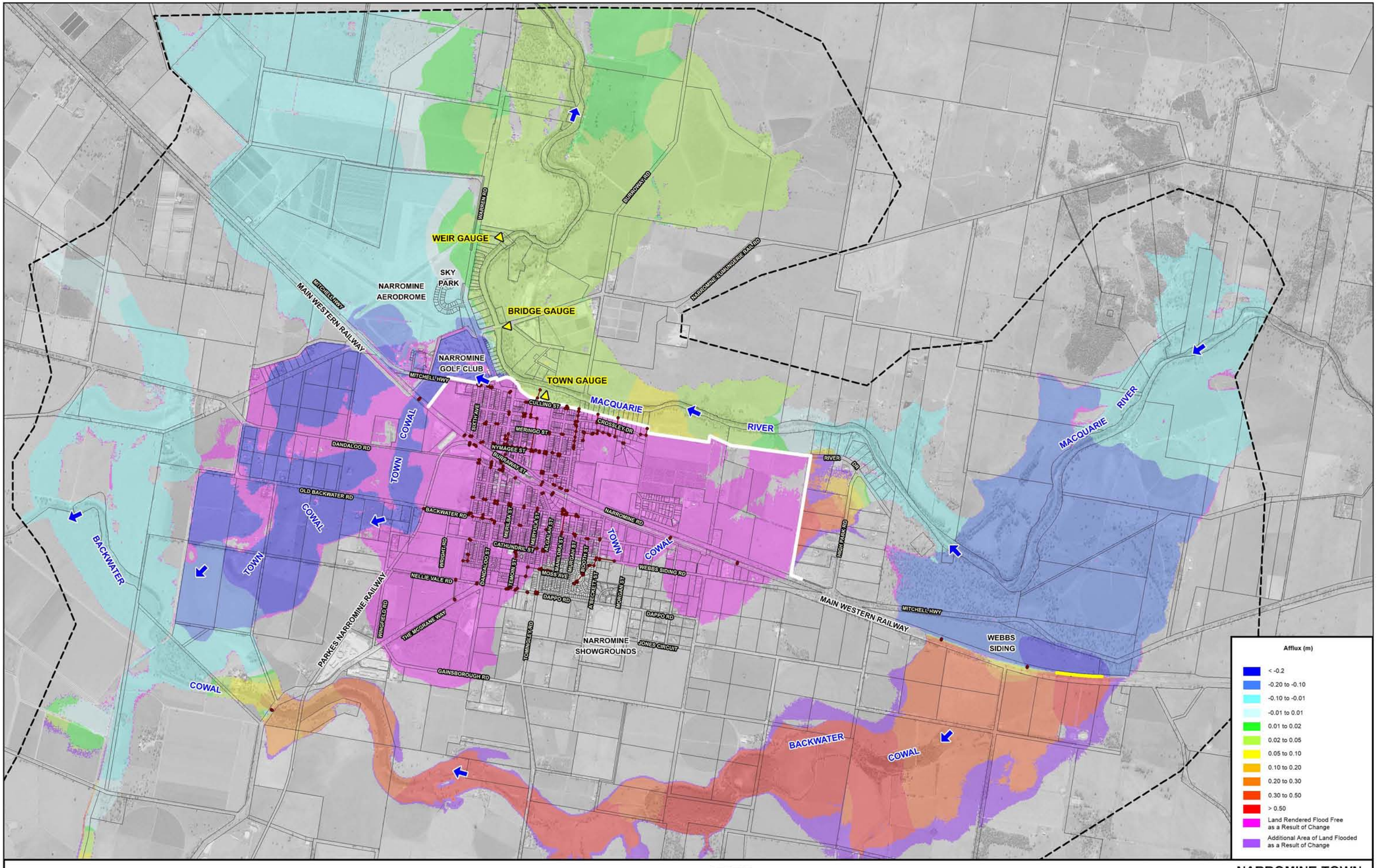
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.22

IMPACT OF LEVEE OPTION B1C WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
1% AEP



N

400 0 400 800 1200 m

Scale: 1:40,000

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

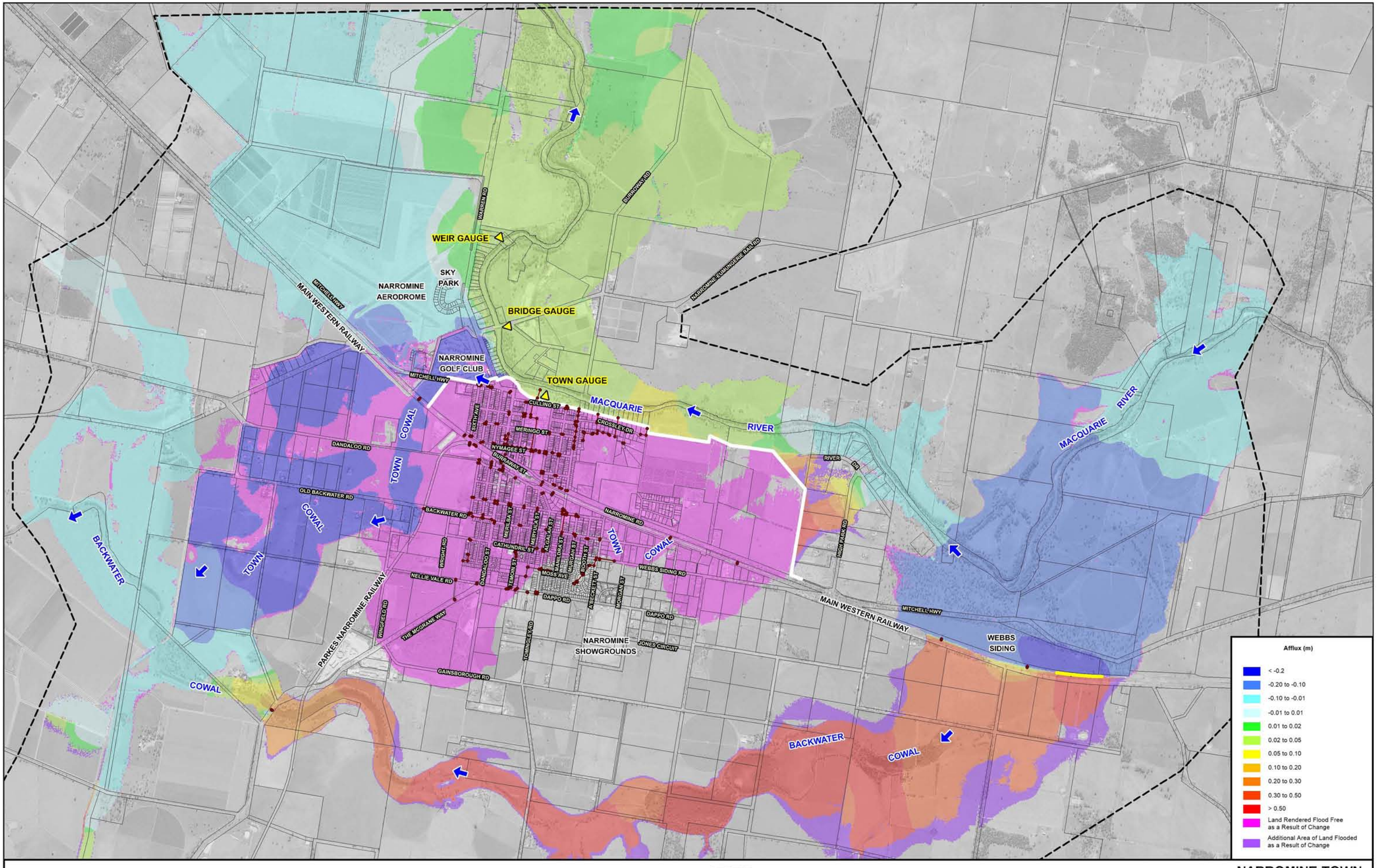
- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure C1.23

IMPACT OF LEVEE OPTION B1B WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
MINOR INCREASE IN PEAK 1% AEP FLOW



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NOTE:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 10 m grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND

- Two-Dimensional Model Boundary
- Modelled Stormwater Drainage System
- Stream Gauge
- Proposed Levee Alignment
- Proposed Railway Culvert Upgrade

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE
Figure C1.24

IMPACT OF LEVEE OPTION B1C WITH RAILWAY CULVERT UPGRADE ON MAIN STREAM FLOODING
MINOR INCREASE IN PEAK 1% AEP FLOW

APPENDIX D

SUGGESTED WORDING FOR INCLUSION IN NARROMINE SHIRE DEVELOPMENT CONTROL PLAN

LIST OF FIGURES (APPENDIX D)

LEGEND

- Main Stream Flooding Flood Planning Area (Refer Schedule 2A of Appendix D)
- Main Stream Flooding Outer Floodplain (Refer Schedule 2A of Appendix D)
- Limit of Flood Planning Area Mapping at Narromine

N

400 0 400 800 1200 m

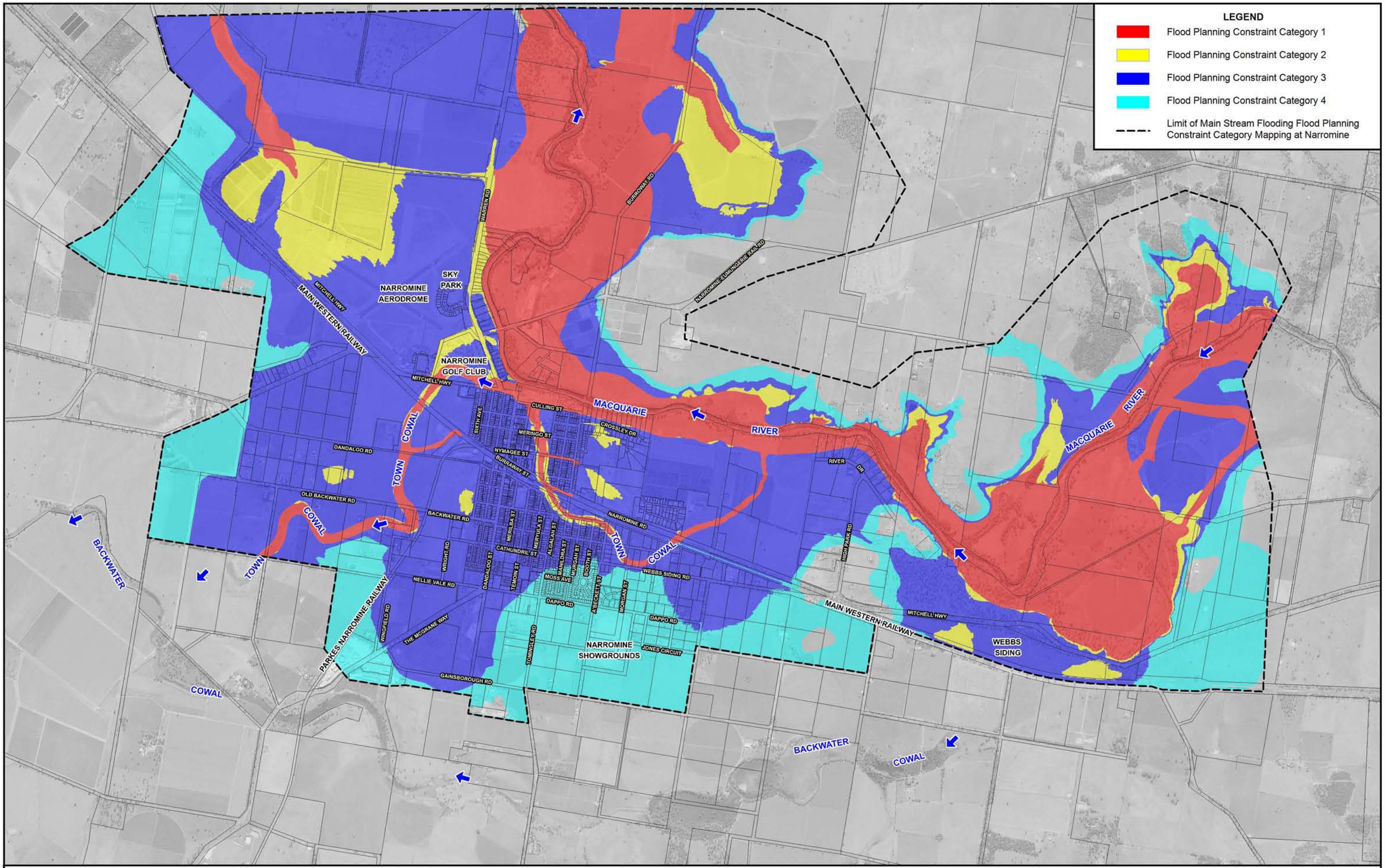
Scale: 1:40,000

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure D1.1

EXTRACT OF FLOOD PLANNING MAP AT NARROMINE



N

400 0 400 800 1200 m

Scale: 1:40,000

Lyall & Associates

NARROMINE TOWN
FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN UPDATE

Figure D1.2

EXTRACT OF FLOOD PLANNING CONSTRAINT CATEGORY MAP AT NARROMINE