

- LEGEND**
- Probable Maximum Flood
 - 500 Year ARI
 - 200 Year ARI
 - 100 Year ARI
 - 50 Year ARI
 - 20 Year ARI
 - 10 Year ARI
 - 5 Year ARI



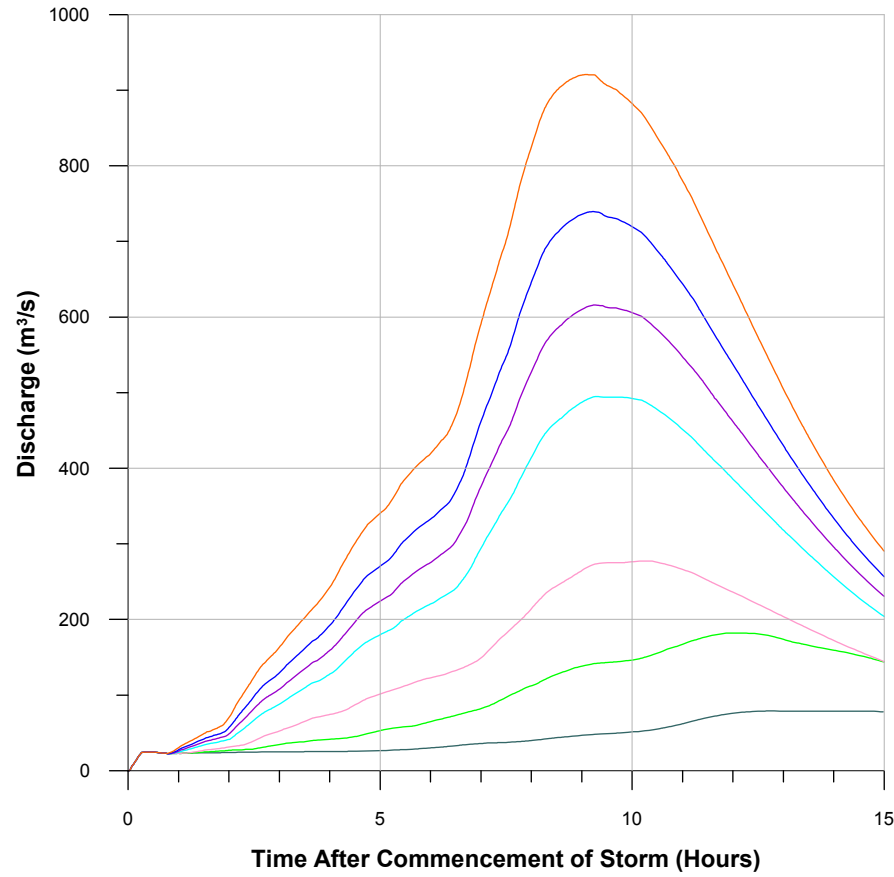
Notes
 1. Location of Ladysmith stream gauge approximate only.
 2. Gauge zero on Ladysmith stream gauge = 195.224 m AHD

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

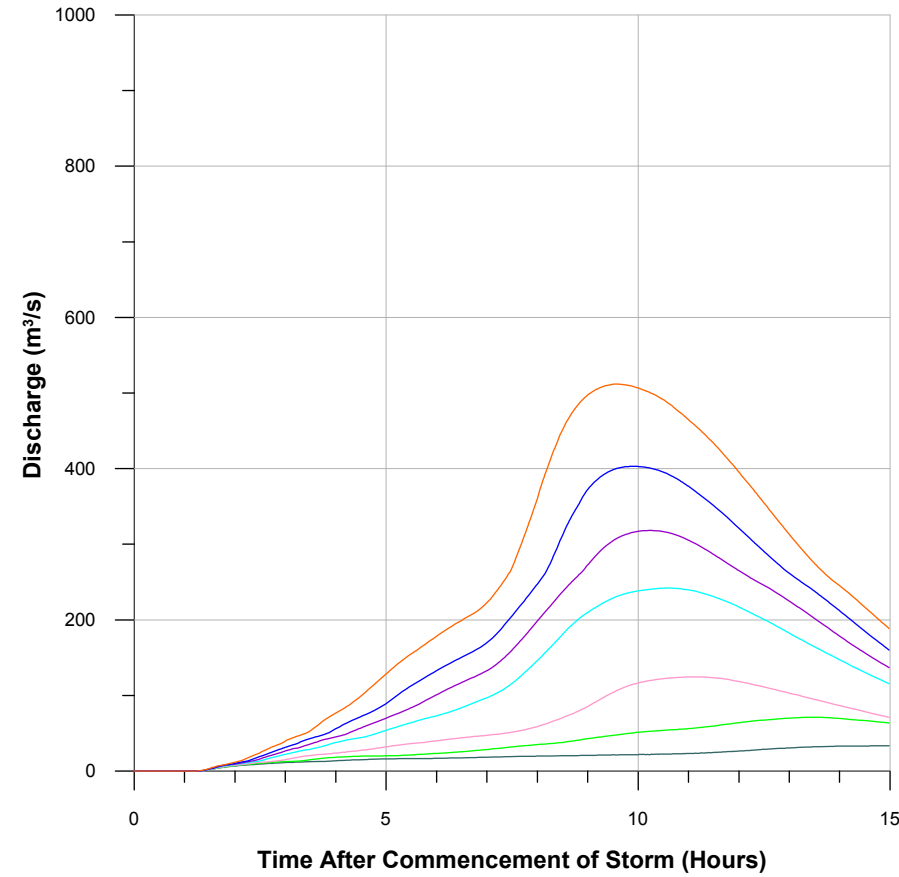
Figure 4.1

DESIGN WATER SURFACE PROFILES
 KYEAMBA CREEK

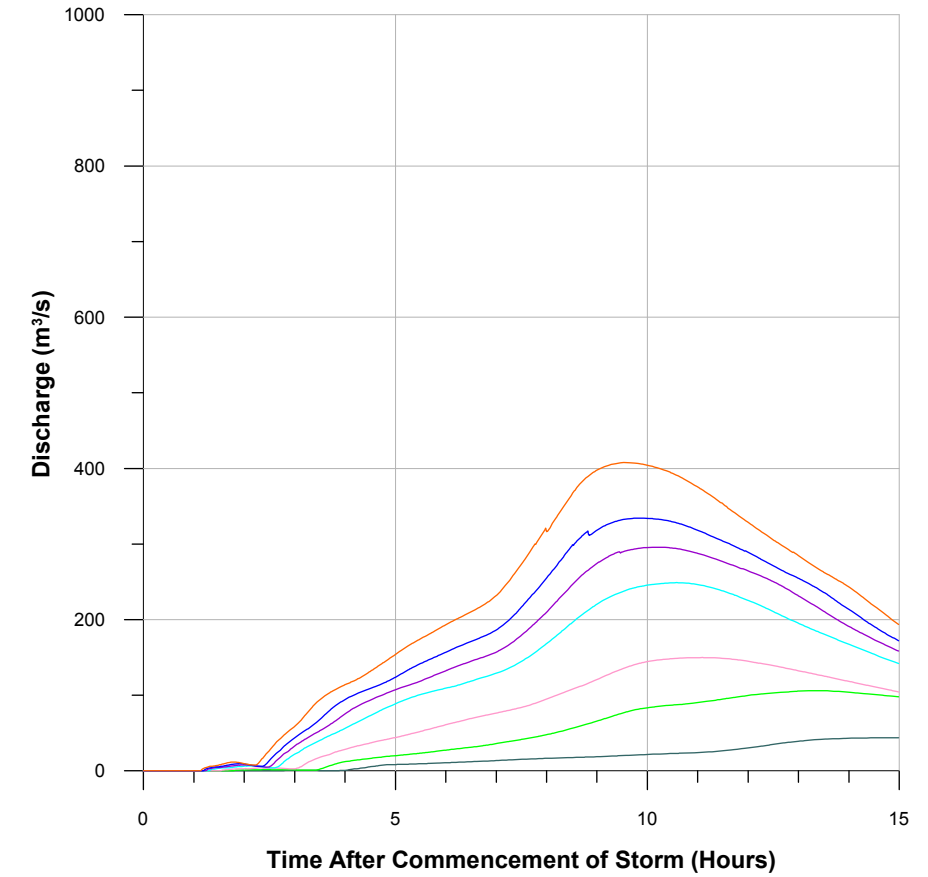
**KYEAMBA CREEK UPSTREAM
EXTENT OF TUFLOW MODEL (Q1)**



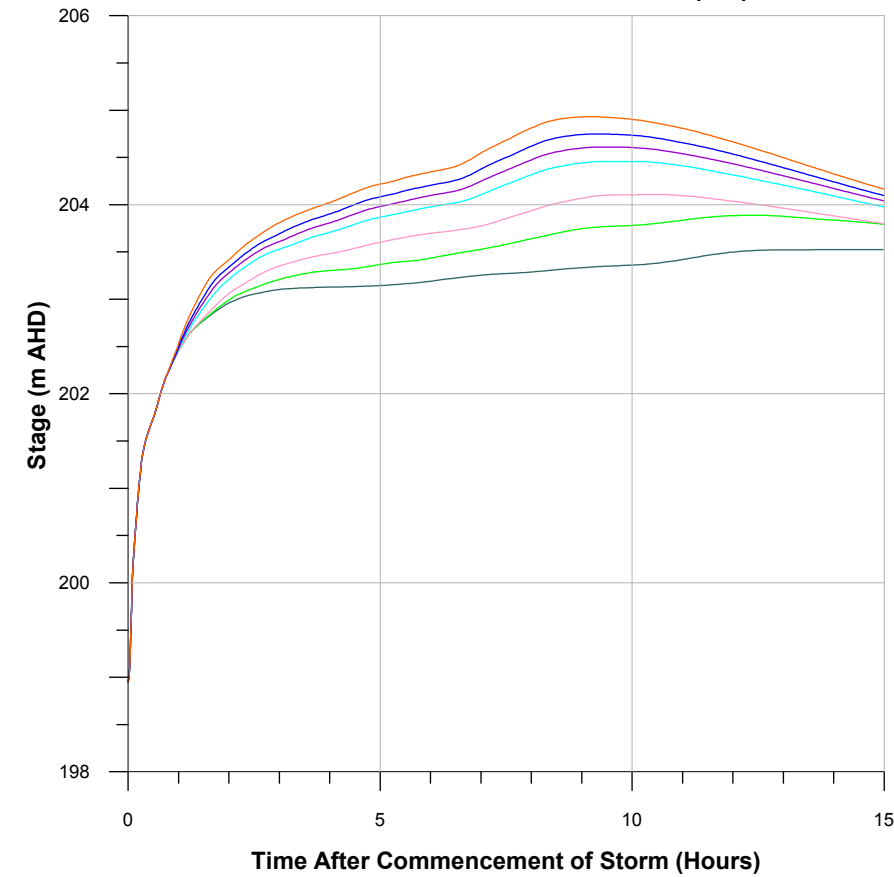
RAILWAY BRIDGE NO.2 (Q2)



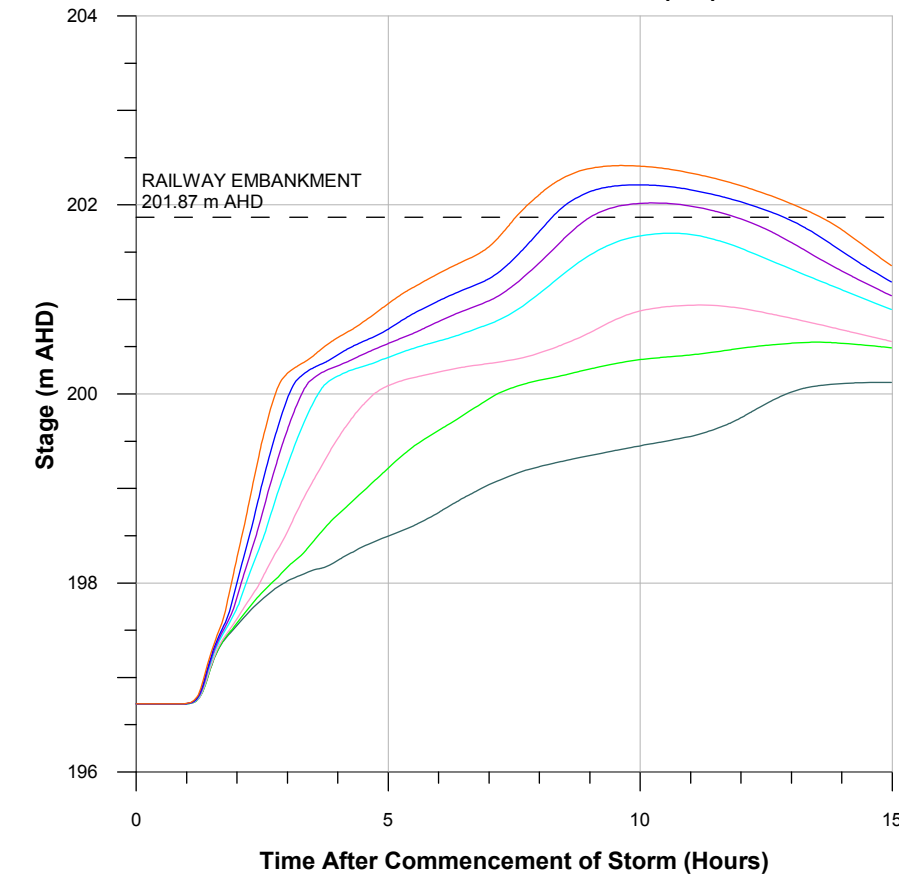
RAILWAY BRIDGE NO.1 (Q3)



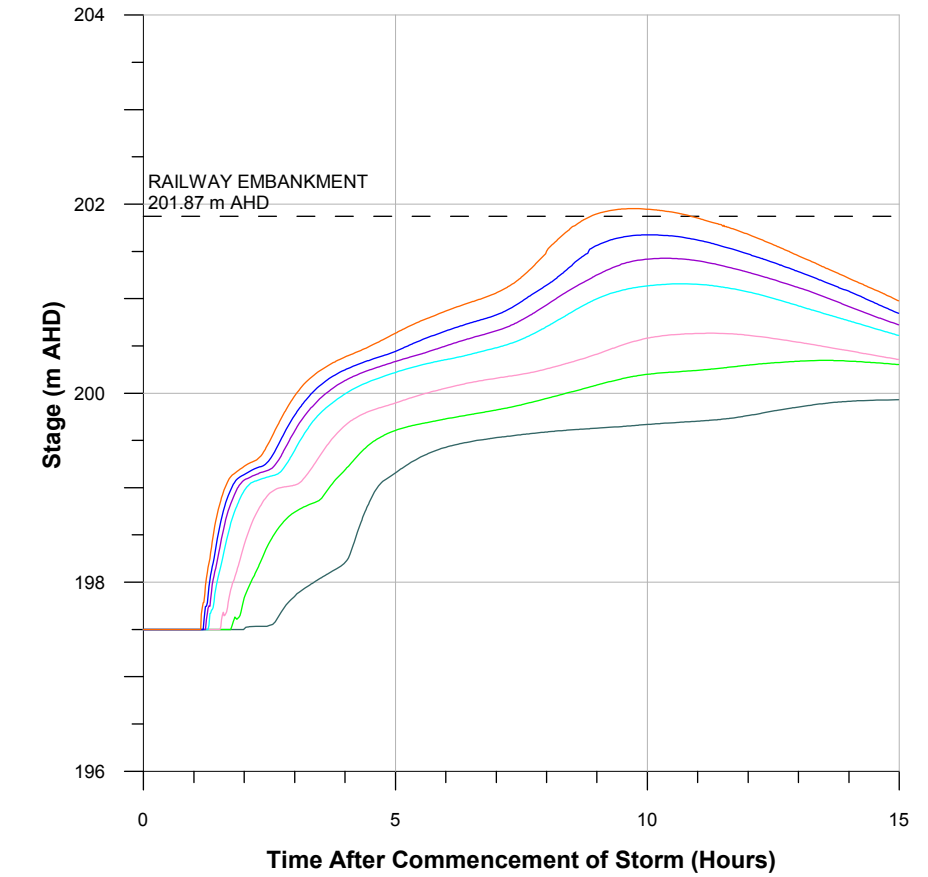
**KYEAMBA CREEK UPSTREAM
EXTENT OF TUFLOW MODEL (Q1)**



RAILWAY BRIDGE NO.2 (Q2)



RAILWAY BRIDGE NO.1 (Q3)



**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
DESIGN FLOOD MODELLING**

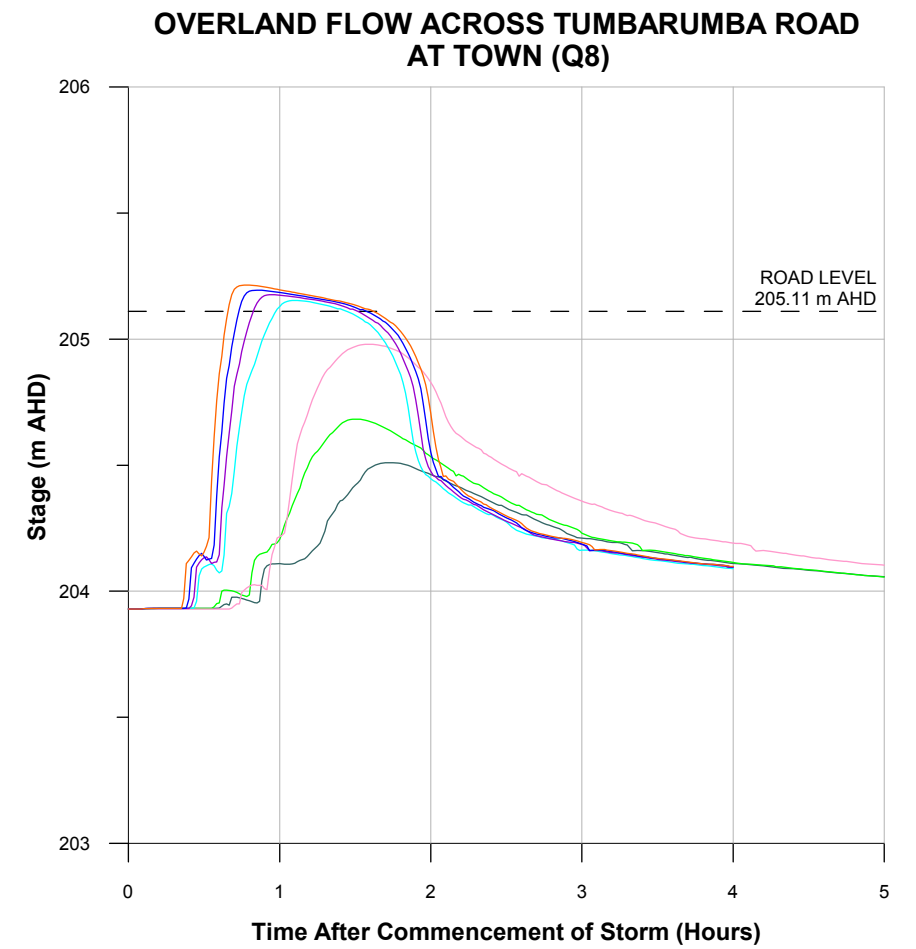
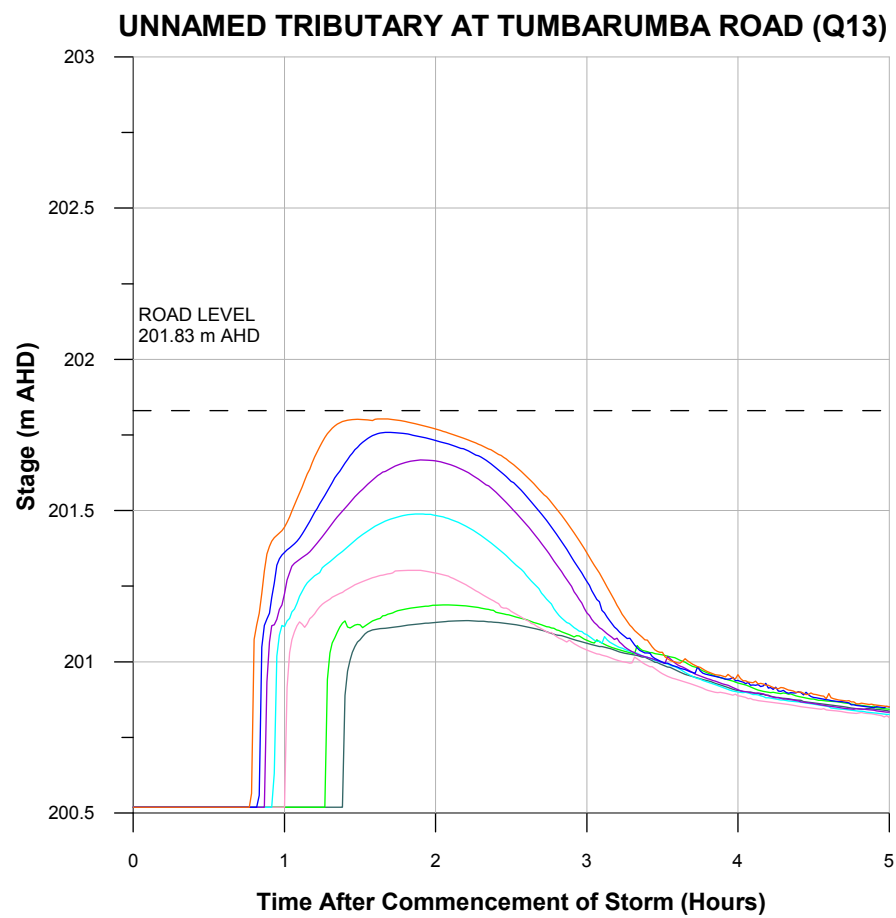
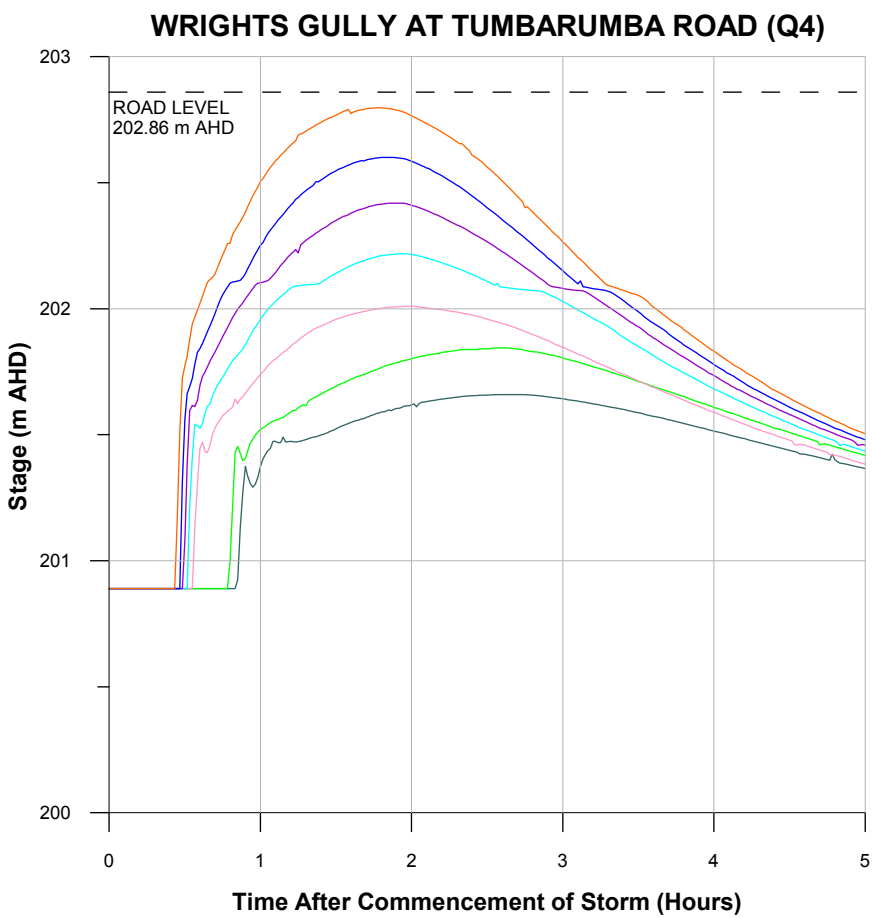
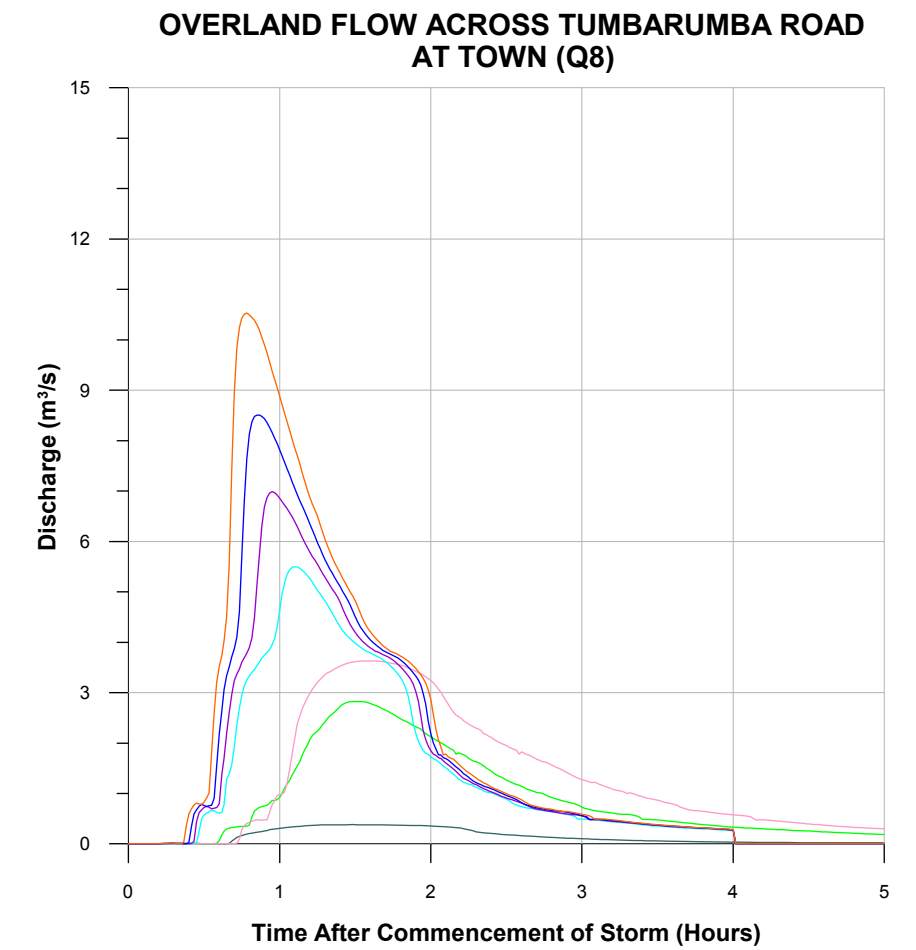
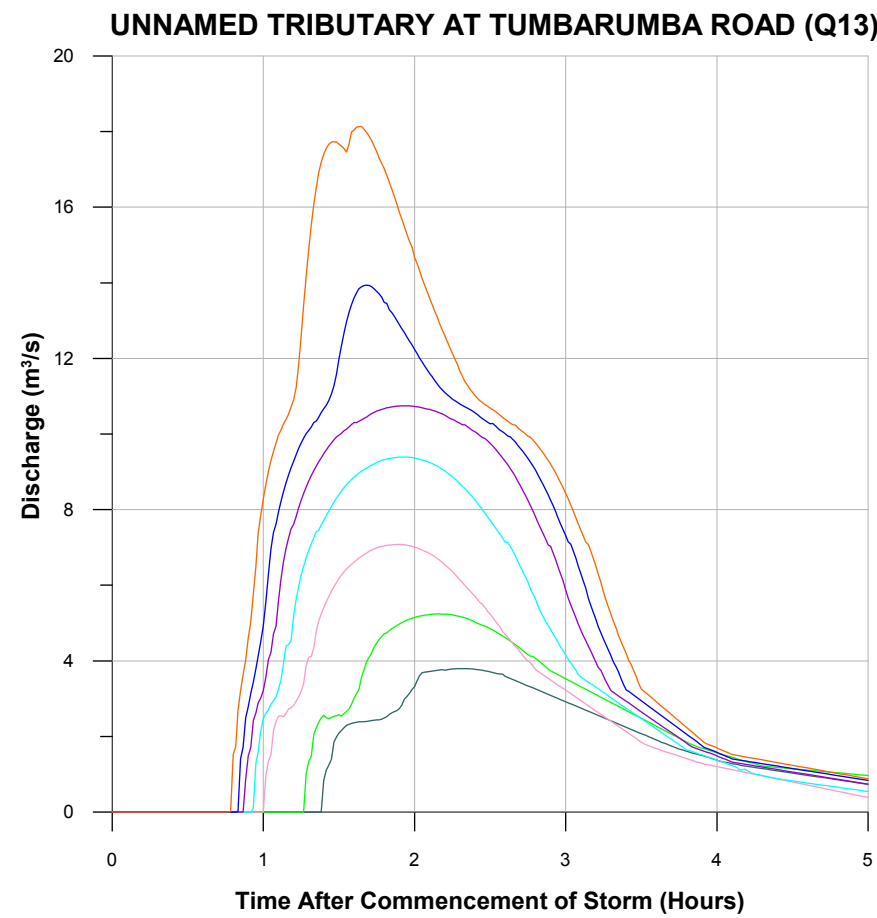
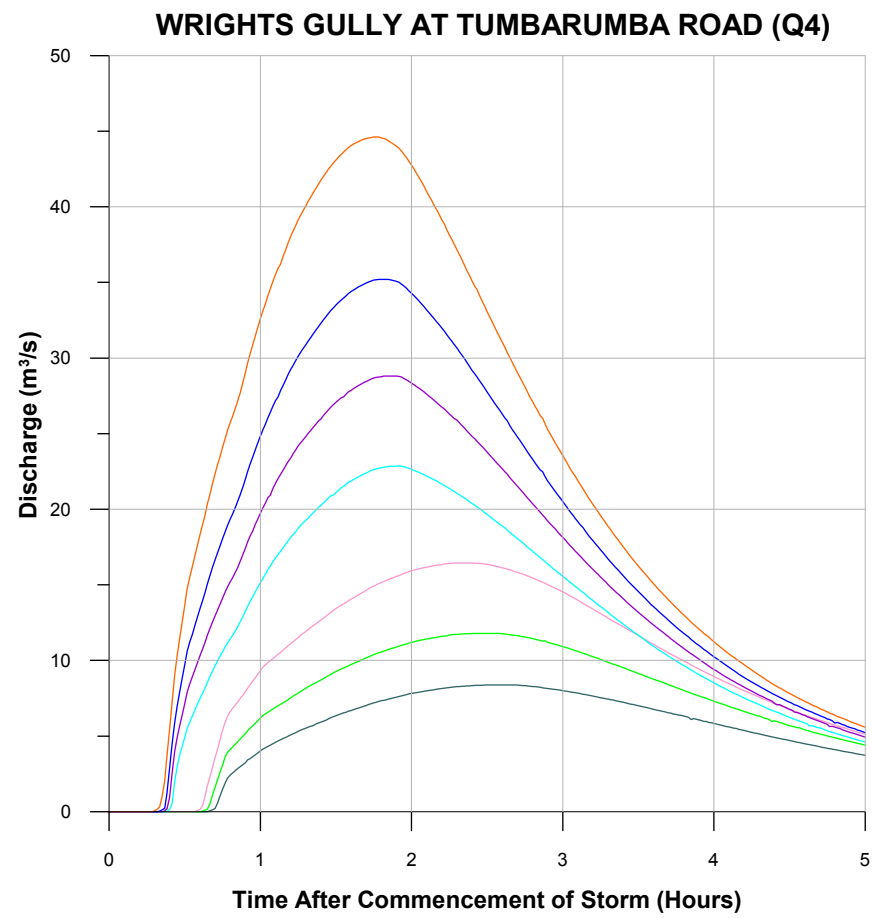
Figure 4.2
Sheet 1 of 2
STAGE AND DISCHARGE HYDROGRAPHS - DESIGN FLOOD EVENTS
KYEAMBA CREEK

NOTE:
1. Discharge hydrographs of Railway Bridge No.2 include surcharge over railway embankment east of Railway Bridge No.2.
2. Discharge hydrograph at Railway Bridge No.1 include surcharge over railway embankment west of Railway Bridge No. 2.
3. Refer Table A2 of Appendix A for storm durations of hydrographs at selected locations.

LEGEND

	500 year ARI		20 year ARI
	200 year ARI		10 year ARI
	100 year ARI		5 year ARI
	50 year ARI		Railway Embankment



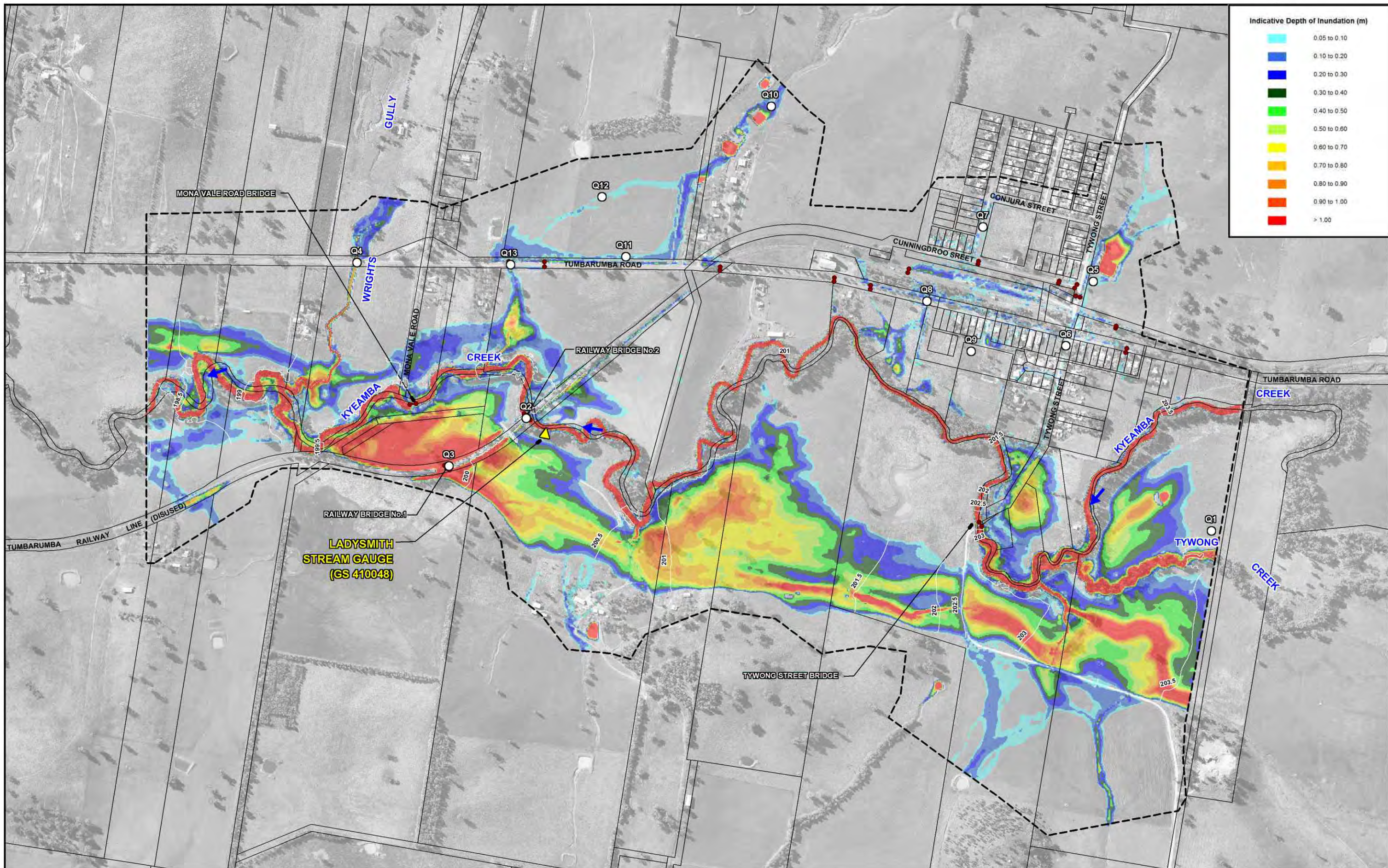


- LEGEND**
- 500 year ARI
 - 200 year ARI
 - 100 year ARI
 - 50 year ARI
 - 20 year ARI
 - 10 year ARI
 - 5 year ARI
 - - - - Railway Embankment

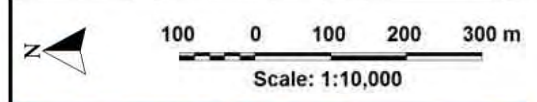


NOTE:
Refer Table A2 of Appendix A for storm durations of hydrographs at selected locations.

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
DESIGN FLOOD MODELLING**



Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow	0.50 to 0.60
Orange	0.60 to 0.70
Red-Orange	0.70 to 0.80
Red	0.80 to 0.90
Dark Red	0.90 to 1.00
Red	> 1.00

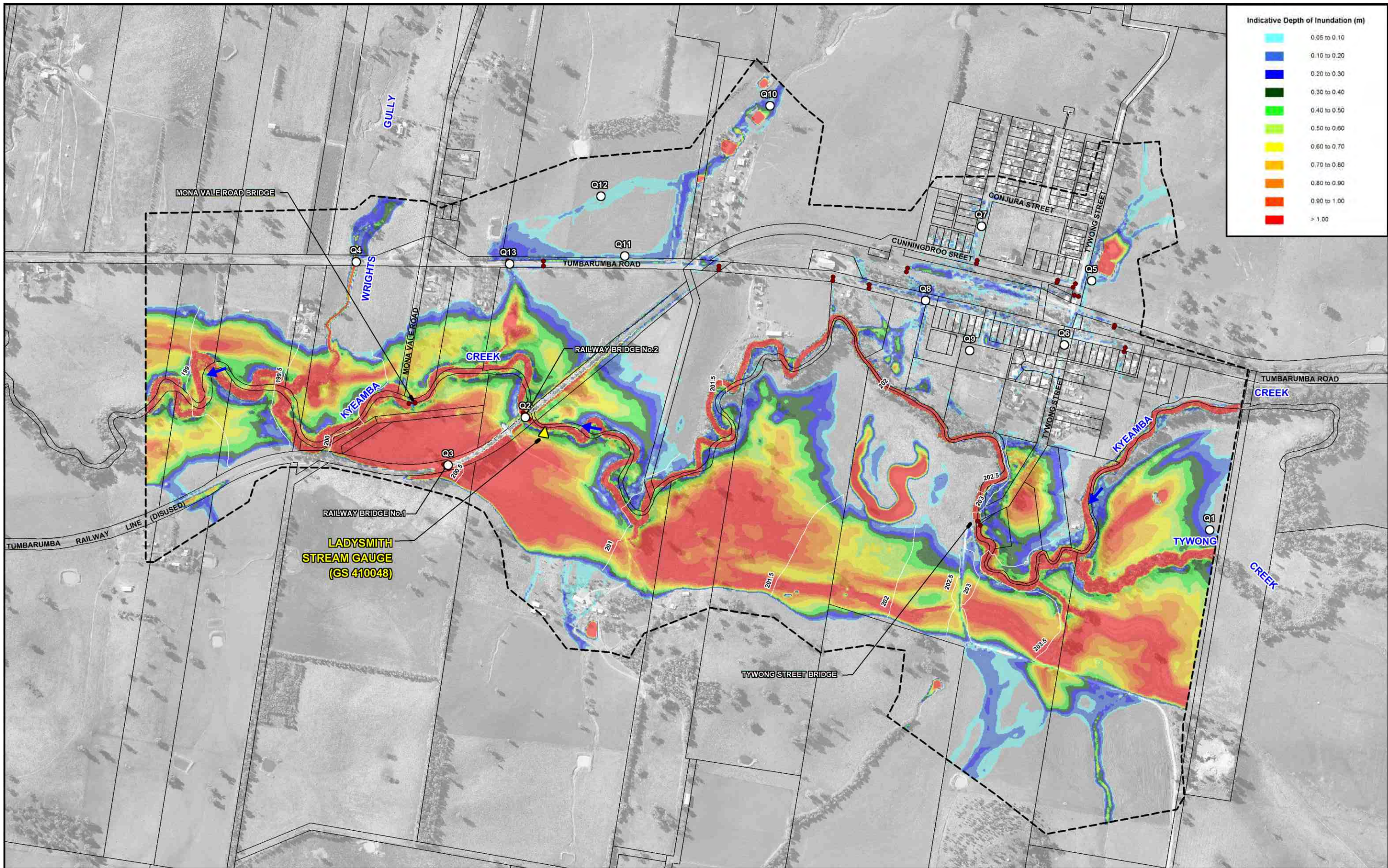


NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

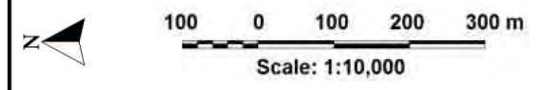
- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

Figure 4.3
 LADYSMITH TUFLOW MODEL RESULTS
 5 YEAR ARI



Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow	0.50 to 0.60
Orange	0.60 to 0.70
Red-Orange	0.70 to 0.80
Red	0.80 to 0.90
Dark Red	0.90 to 1.00
Red	> 1.00



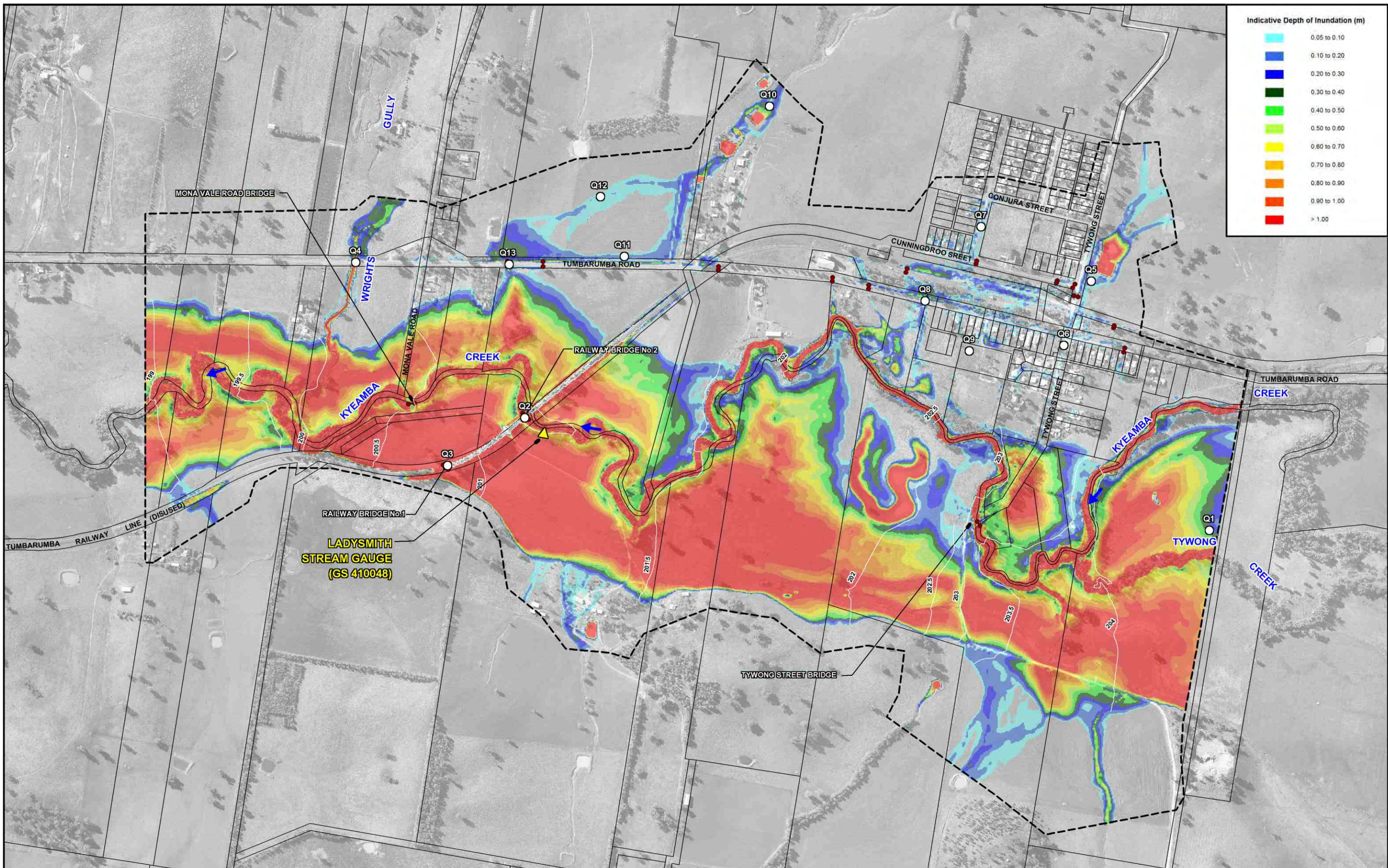
NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

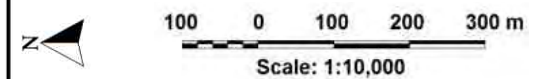
**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

Figure 4.4

LADYSMITH TUFLOW MODEL RESULTS
 10 YEAR ARI



Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow-Green	0.50 to 0.60
Yellow	0.60 to 0.70
Orange	0.70 to 0.80
Red-Orange	0.80 to 0.90
Red	0.90 to 1.00
Dark Red	> 1.00



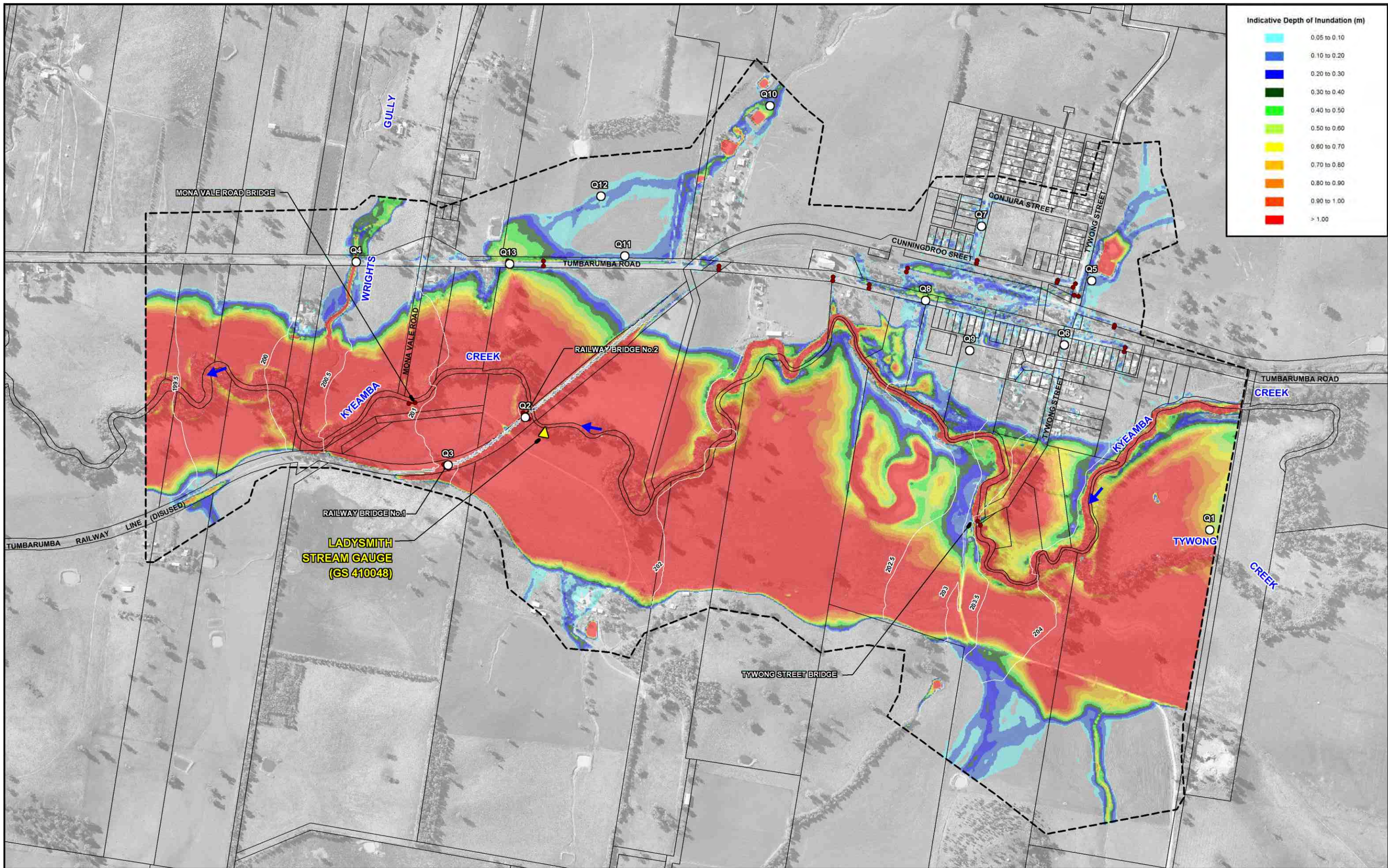
Lyll & Associates

NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

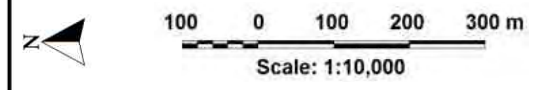
- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

Figure 4.5
 LADYSMITH TUFLOW MODEL RESULTS
 20 YEAR ARI



Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow	0.50 to 0.60
Orange	0.60 to 0.70
Red-Orange	0.70 to 0.80
Red	0.80 to 0.90
Dark Red	0.90 to 1.00
Red	> 1.00



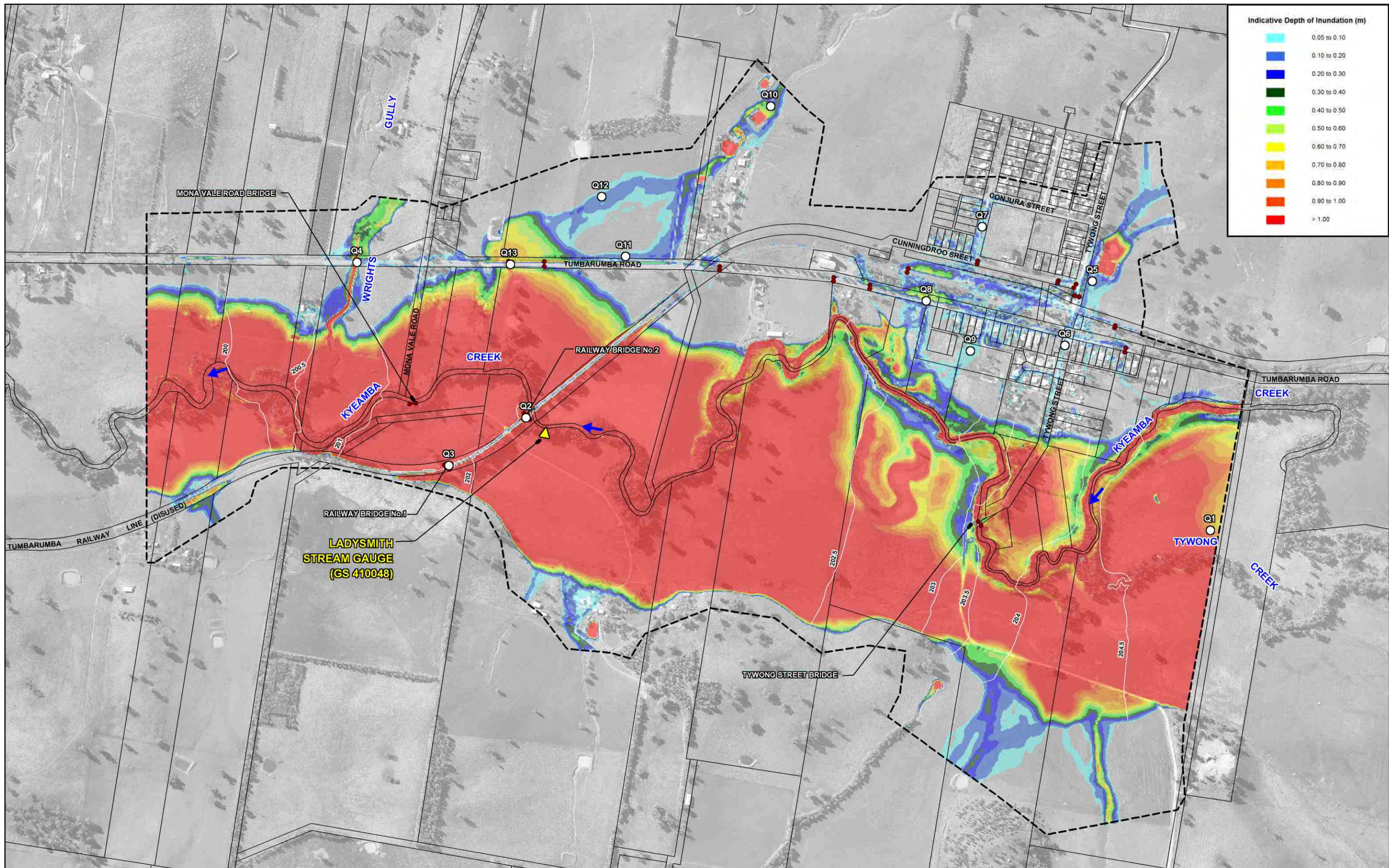
NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

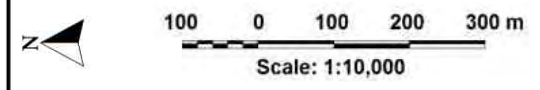
Figure 4.6

LADYSMITH TUFLOW MODEL RESULTS
 50 YEAR ARI



Indicative Depth of Inundation (m)

Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow	0.50 to 0.60
Orange	0.60 to 0.70
Red-Orange	0.70 to 0.80
Red	0.80 to 0.90
Dark Red	0.90 to 1.00
Red	> 1.00

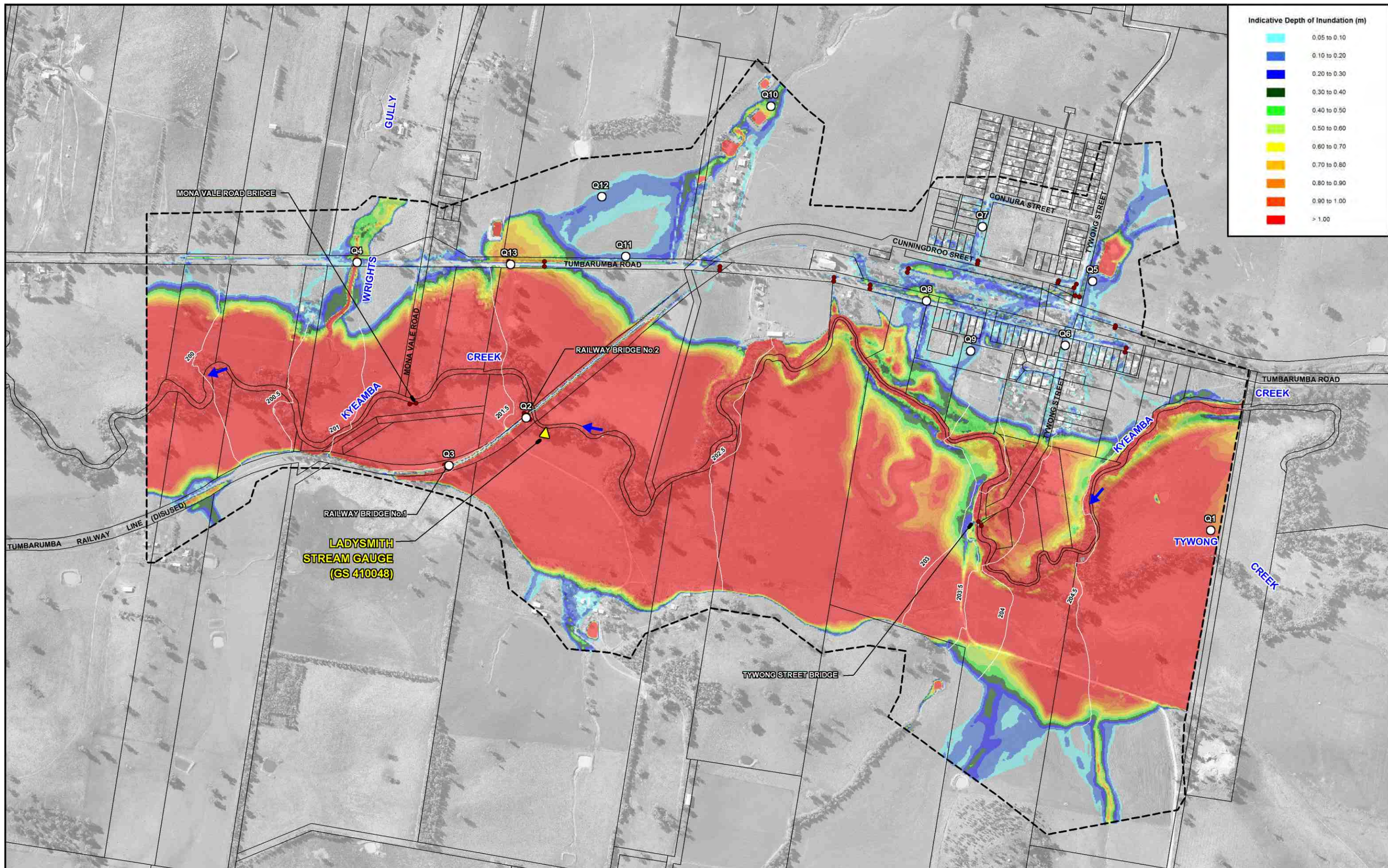


NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

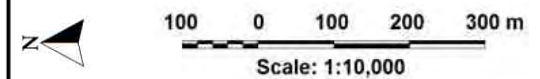
- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

Figure 4.7
 LADYSMITH TUFLOW MODEL RESULTS
 100 YEAR ARI



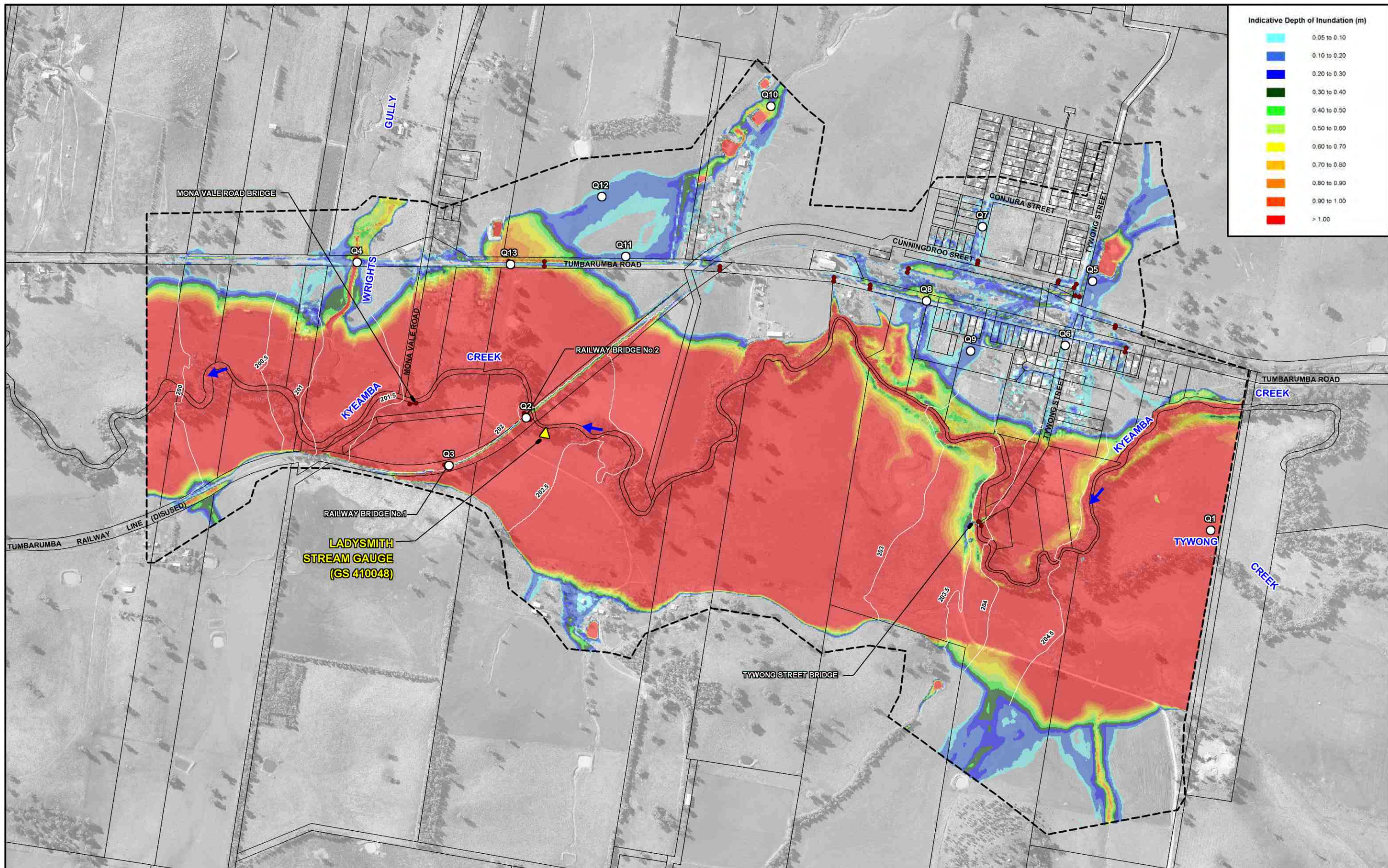
Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow	0.50 to 0.60
Orange	0.60 to 0.70
Red-Orange	0.70 to 0.80
Red	0.80 to 0.90
Dark Red	0.90 to 1.00
Red	> 1.00



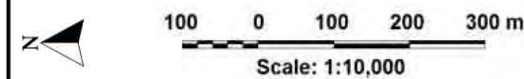
NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**



Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow	0.50 to 0.60
Orange	0.60 to 0.70
Red-Orange	0.70 to 0.80
Red	0.80 to 0.90
Dark Red	0.90 to 1.00
Red	> 1.00

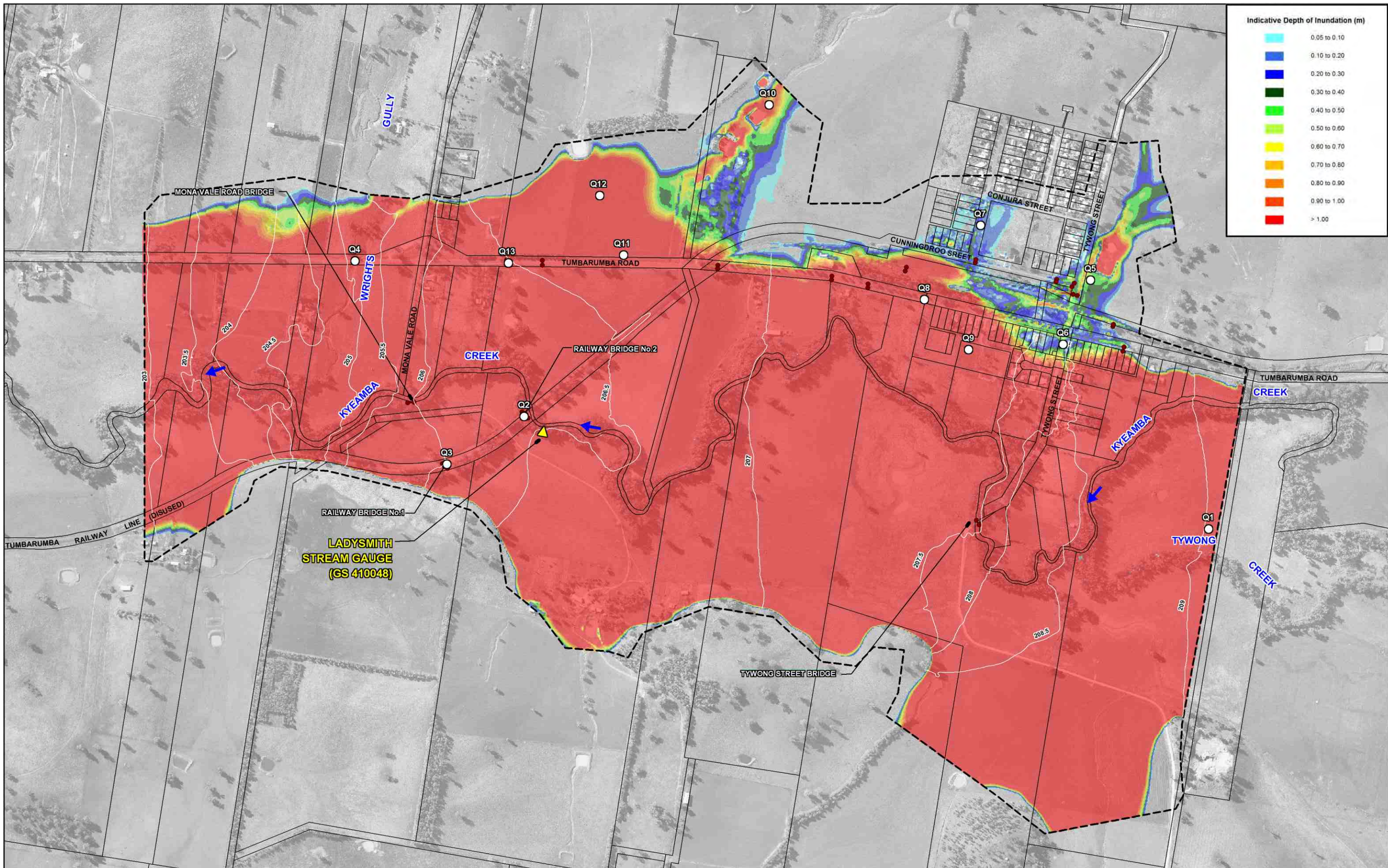


NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

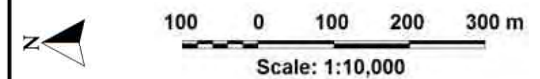
- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - 203 Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Q1 Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

Figure 4.9



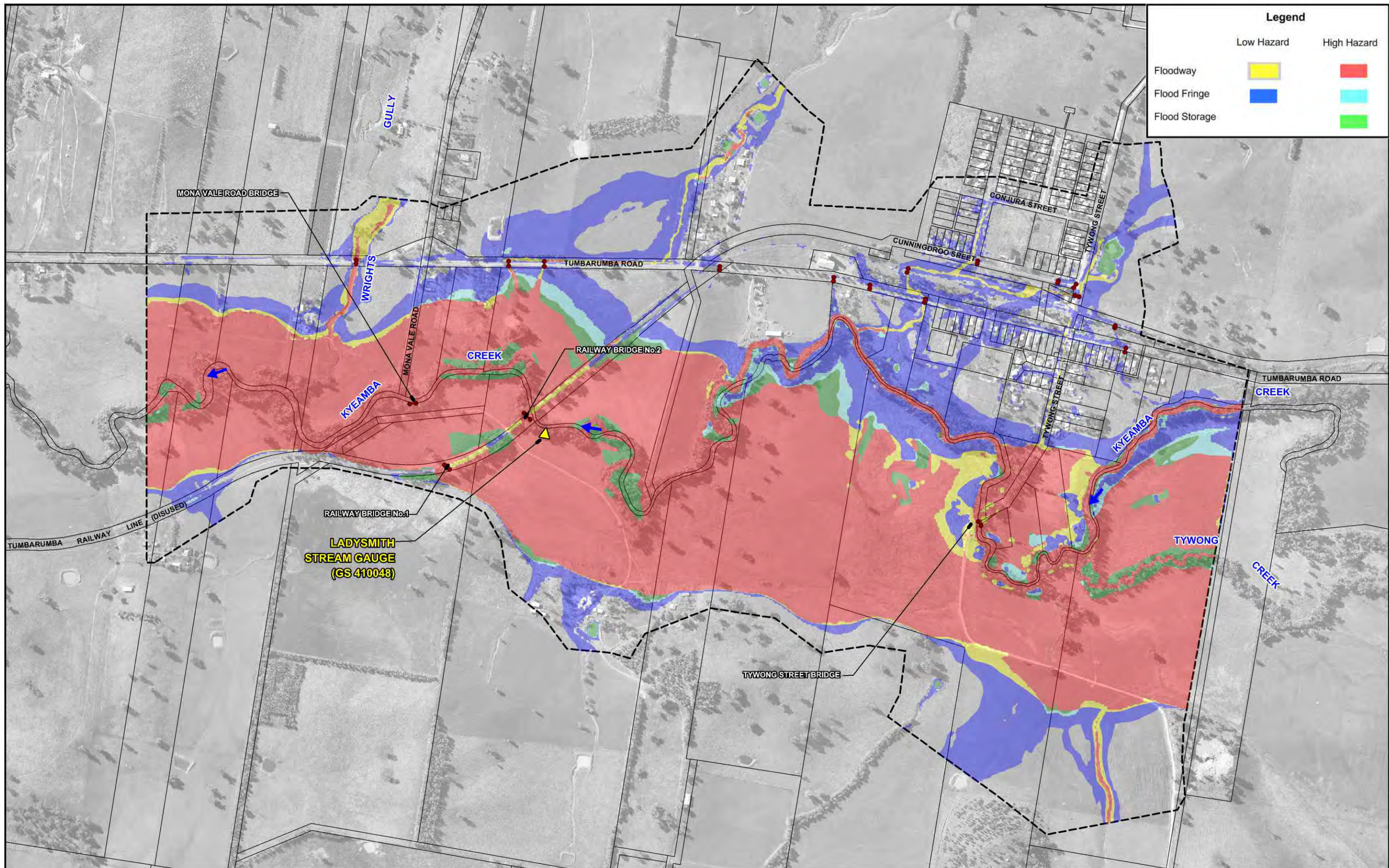
Indicative Depth of Inundation (m)	
Light Blue	0.05 to 0.10
Blue	0.10 to 0.20
Dark Blue	0.20 to 0.30
Green	0.30 to 0.40
Light Green	0.40 to 0.50
Yellow-Green	0.50 to 0.60
Yellow	0.60 to 0.70
Orange	0.70 to 0.80
Dark Orange	0.80 to 0.90
Red-Orange	0.90 to 1.00
Red	> 1.00



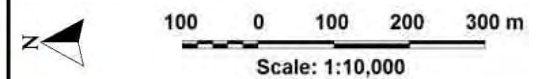
NOTE:
 The extent and depths of flooding shown were determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - 208.5 Water Surface Contours (m AHD) (Mainstream Flooding Only)
 - Q1 Peak Flow Locations and Identifier (Refer Table A2 of Appendix A)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**



Legend	
Low Hazard	High Hazard
Floodway	Floodway
Flood Fringe	Flood Fringe
Flood Storage	Flood Storage



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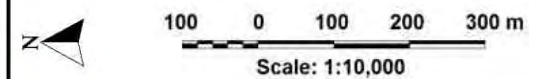
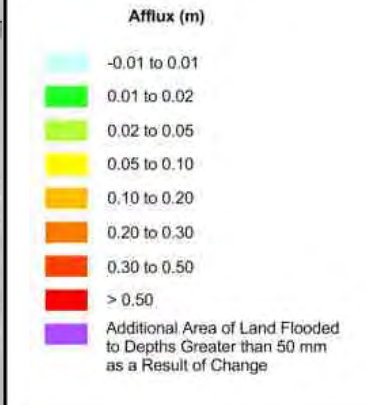
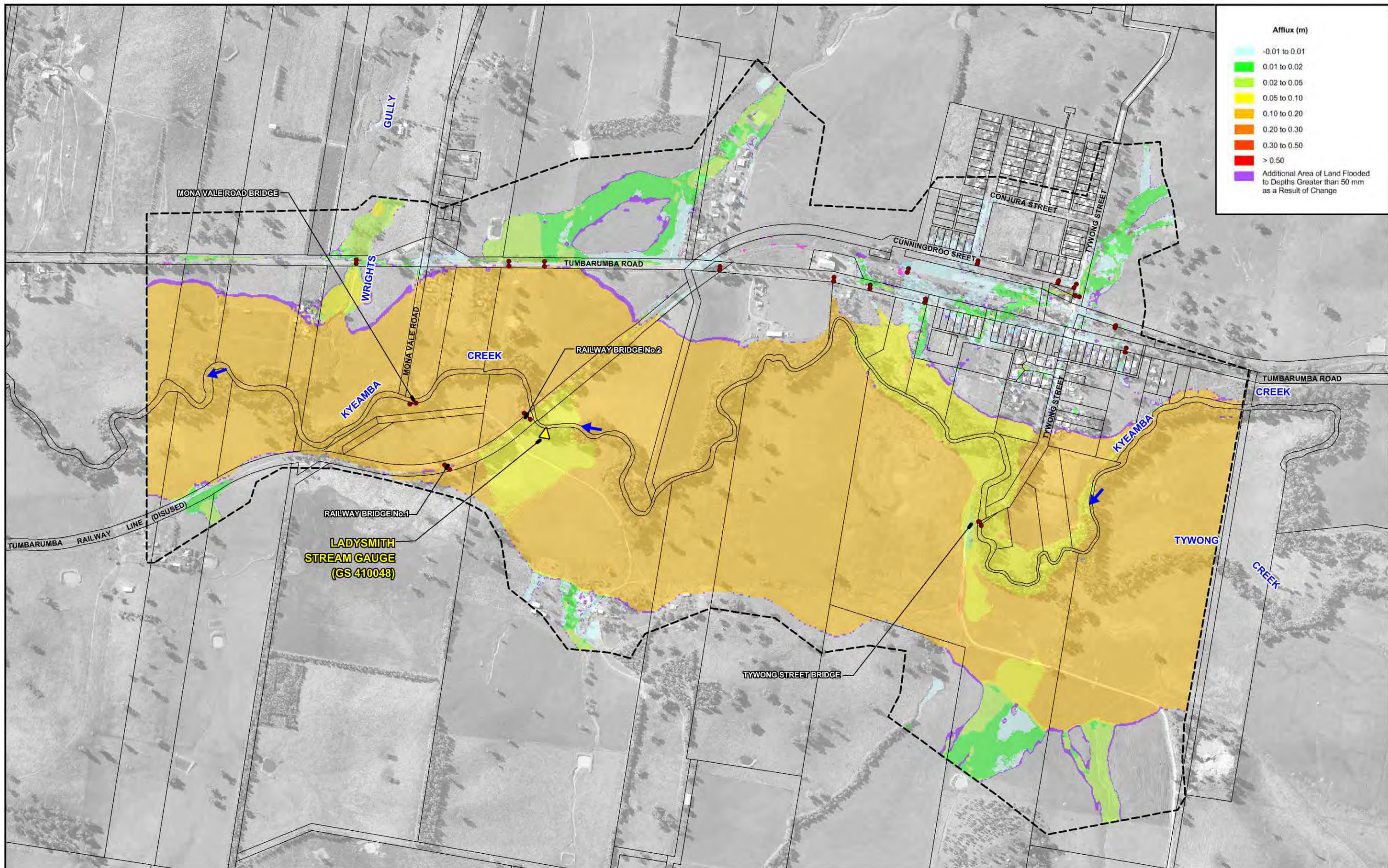
NOTE:
 The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

LEGEND	
	Modelled Stormwater Network
	Two-Dimensional Model Boundary

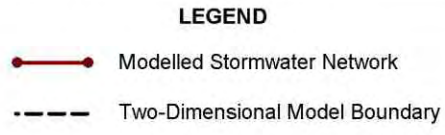
**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

LADYSMITH PROVISIONAL FLOOD HAZARD AND HYDRAULIC CATEGORISATION OF FLOODPLAIN
 100 YEAR ARI

Figure 4.11



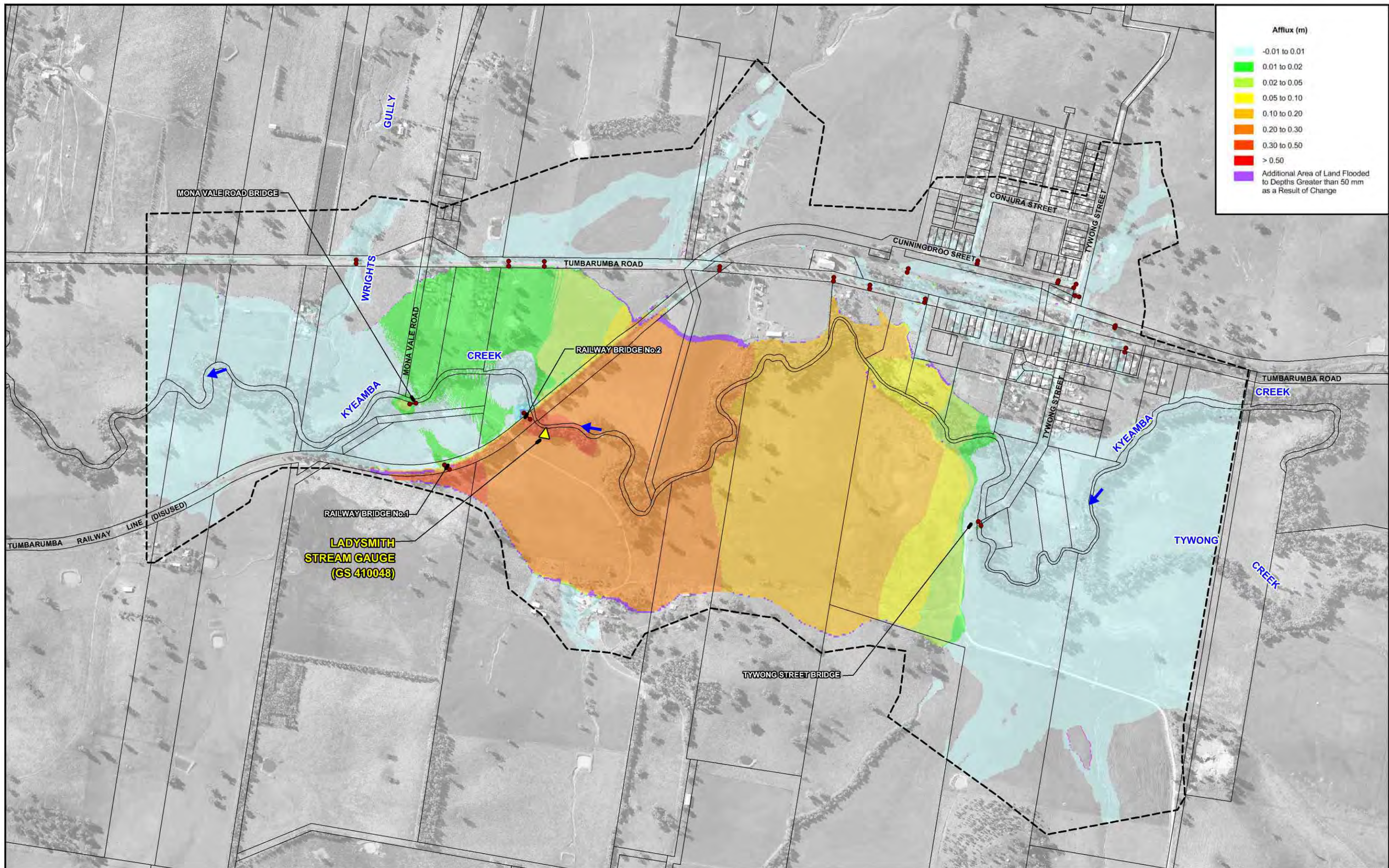
NOTE:
 The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.



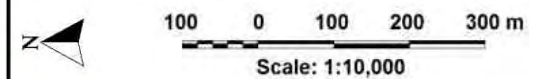
**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

**SENSITIVITY OF FLOOD BEHAVIOUR AT LADYSMITH TO 20% INCREASE IN HYDRAULIC ROUGHNESS VALUES
 100 YEAR ARI 6 HOUR STORM**

Figure 4.12



Afflux (m)	
Light Blue	-0.01 to 0.01
Light Green	0.01 to 0.02
Yellow-Green	0.02 to 0.05
Yellow	0.05 to 0.10
Orange	0.10 to 0.20
Dark Orange	0.20 to 0.30
Red	0.30 to 0.50
Dark Red	> 0.50
Purple	Additional Area of Land Flooded to Depths Greater than 50 mm as a Result of Change



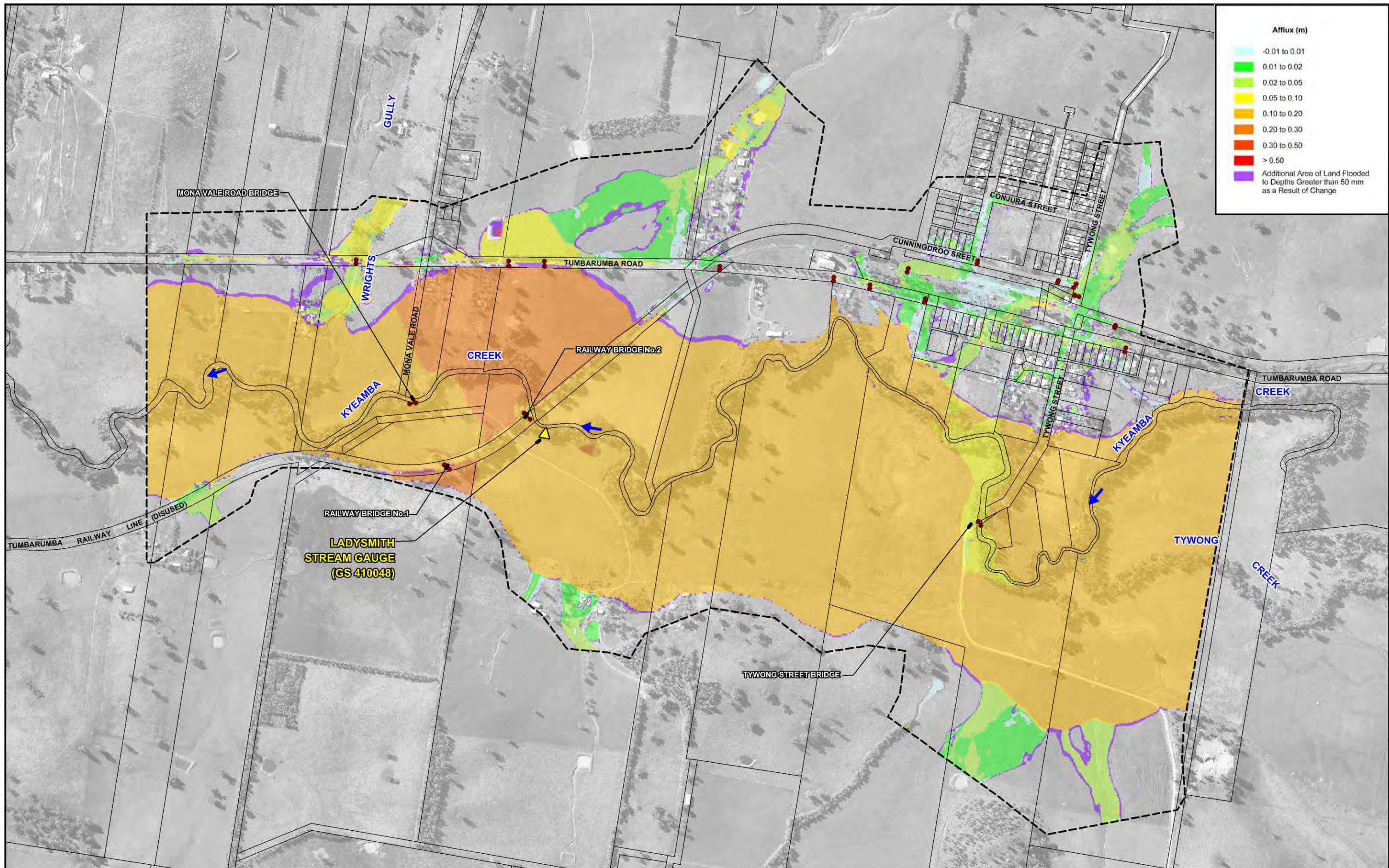
NOTE:
 The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

**SENSITIVITY OF FLOOD BEHAVIOUR AT LADYSMITH TO A PARTIAL BLOCKAGE OF MAJOR HYDRAULIC STRUCTURES
 100 YEAR ARI 6 HOUR STORM**

Figure 4.13



Afflux (m)	
Light Blue	-0.01 to 0.01
Green	0.01 to 0.02
Yellow-Green	0.02 to 0.05
Yellow	0.05 to 0.10
Orange	0.10 to 0.20
Red-Orange	0.20 to 0.30
Red	0.30 to 0.50
Dark Red	> 0.50
Purple	Additional Area of Land Flooded to Depths Greater than 50 mm as a Result of Change

Scale: 1:10,000

LEGEND
 ●—● Modelled Stormwater Network
 - - - Two-Dimensional Model Boundary

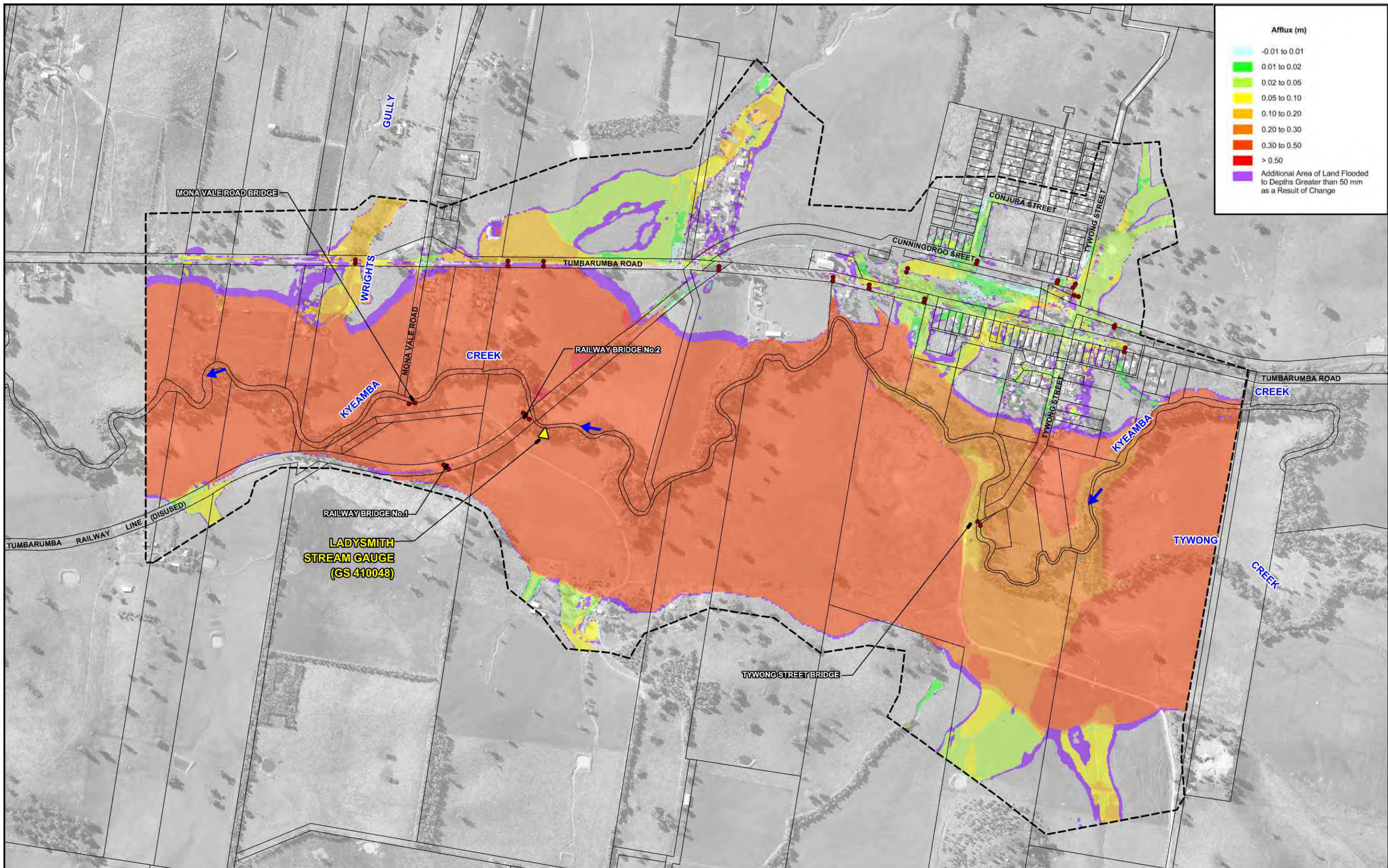
**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**



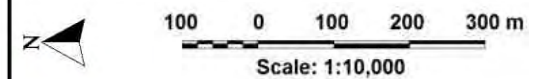
NOTE:
 The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

**SENSITIVITY OF FLOOD BEHAVIOUR AT LADYSMITH TO 10% INCREASE IN RAINFALL INTENSITY
 100 YEAR ARI**

Figure 4.14



Afflux (m)	
Lightest Blue	-0.01 to 0.01
Light Blue	0.01 to 0.02
Medium Blue	0.02 to 0.05
Darker Blue	0.05 to 0.10
Dark Blue	0.10 to 0.20
Very Dark Blue	0.20 to 0.30
Black	0.30 to 0.50
Darkest Blue	> 0.50
Purple	Additional Area of Land Flooded to Depths Greater than 50 mm as a Result of Change



LEGEND

- Modelled Stormwater Network
- Two-Dimensional Model Boundary

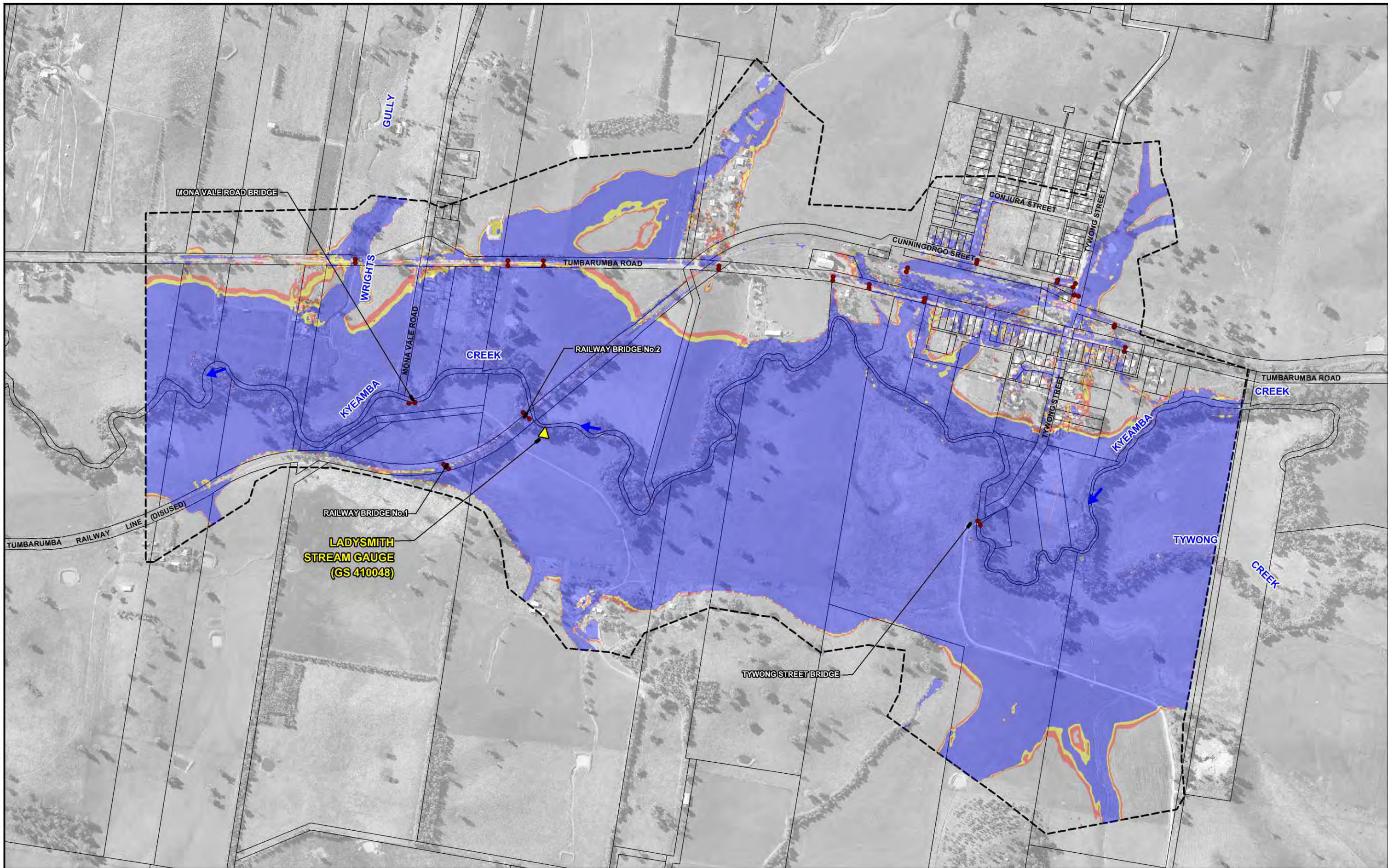
**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
DESIGN FLOOD MODELLING**



NOTE:
The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

**SENSITIVITY OF FLOOD BEHAVIOUR AT LADYSMITH TO 30% INCREASE IN RAINFALL INTENSITY
100 YEAR ARI**

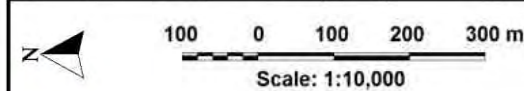
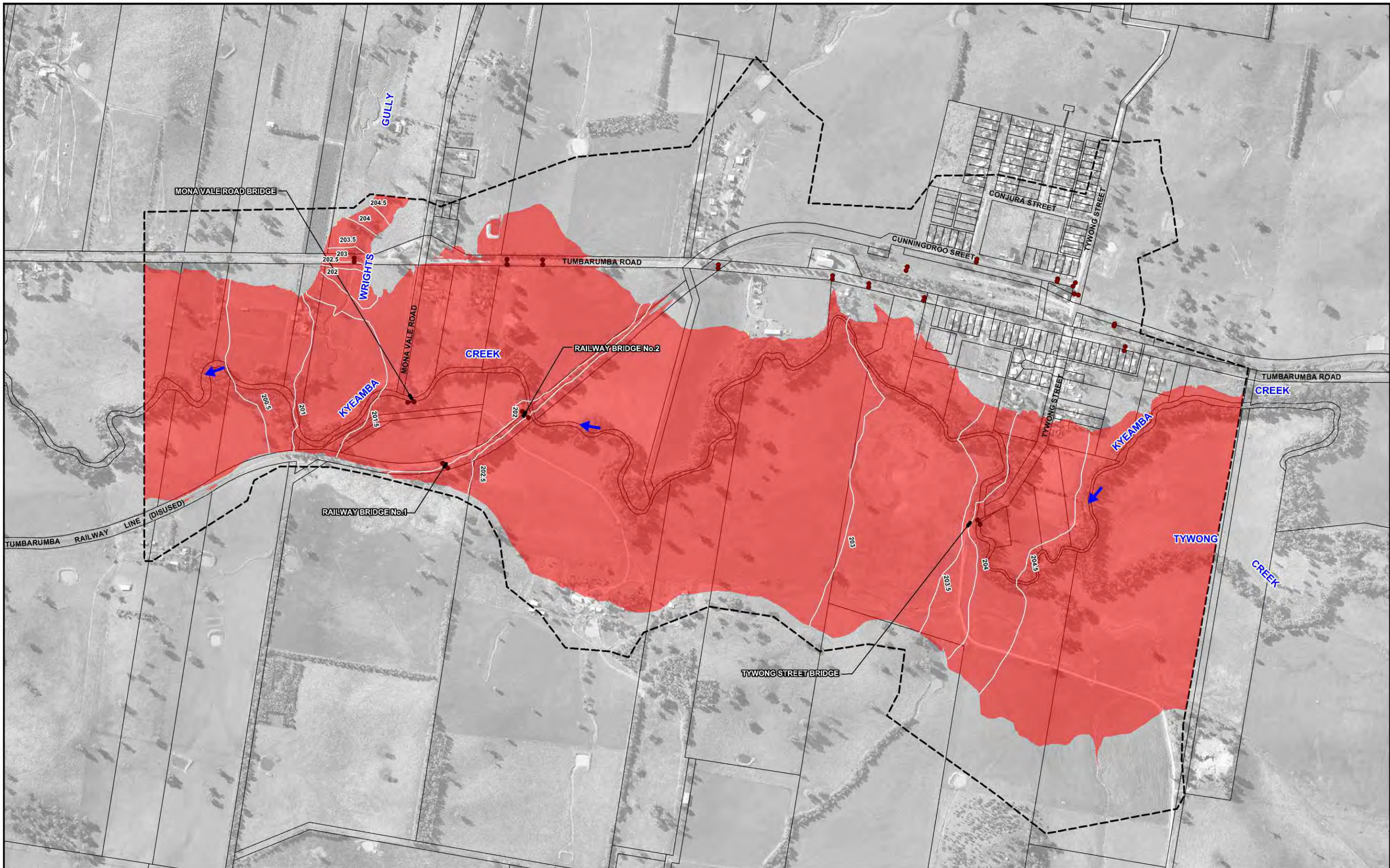
Figure 4.15



TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
DESIGN FLOOD MODELLING





- LEGEND**
- Modelled Stormwater Network
 - Two-Dimensional Model Boundary
 - 100 Year ARI
 - 100 Year ARI Rainfall Increased by 10%
 - 100 Year ARI Rainfall Increased by 30%

NOTE:
The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.



NOTE:
 The extent of flooding shown was determined from airborne laser scanning survey and are approximate only. The extent of inundation in individual allotments near the flood fringe should be confirmed by site specific survey.

LEGEND

-  Modelled Stormwater Network
-  Two-Dimensional Model Boundary
-  Alignment of Existing Levee
-  Interim Flood Planning Area (FPA) and resulting Flood Planning Level (FPL) (m AHD)

**TARCUTTA, LADYSMITH AND URANQUINTY FLOOD STUDIES
 DESIGN FLOOD MODELLING**

Figure 4.17

**INTERIM FLOOD PLANNING AREA AT LADYSMITH
 MAIN STREAM FLOODING ONLY**