NARRABRI SHIRE COUNCIL

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

DECEMBER 2019

VOLUME 2 – FIGURES

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NAMOI RIVER AT GUNIDGERA WEIR - STORAGE GAUGE (GS419060)

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NAMOI RIVER AT DOWNSTREAM GUNIDGERA WEIR (GS419059)

NAMOI RIVER AT MOLLEE (GS419039)

NARRABRI CREEK AT NARRABRI (GS419003)

NAMOI RIVER AT NARRABRI (GS419002)

WEE WAA

WEE WAA AIRPORT

NARRABRI

NARRABRI AIRPORT

MYALL VALE

CUDGEWA LANE

PIAN CREEK

KAMILAROI HIGHWAY

GUNIDGERA CREEK

SPRING PLAINS ROAD

GALATHERA CREEK

BAID HILL ROAD

NAMOI RIVER

RIVER ROAD

O'BRIENS CHANNEL

MOLLEE CREEK

CULGOORA ROAD

BOBBIWAA CREEK

SPRING CREEK

WERRIS CREEK MUNGINDI RAILWAY LINE

NARRABRI WEST WALGETT RAILWAY LINE

ILLAROO CREEK

BUNDOCK CREEK

PILLIGA ROAD

YARRIE LAKE ROAD

SANDY HOOK LANE

FOREST WAY

HIBBENS ROAD

KIANDOOL LANE

BOHENA CREEK

NEWELL HIGHWAY

N

1.5 0 1.5 3.0 4.5 km

Scale: 1:150,000

Lyall & Associates

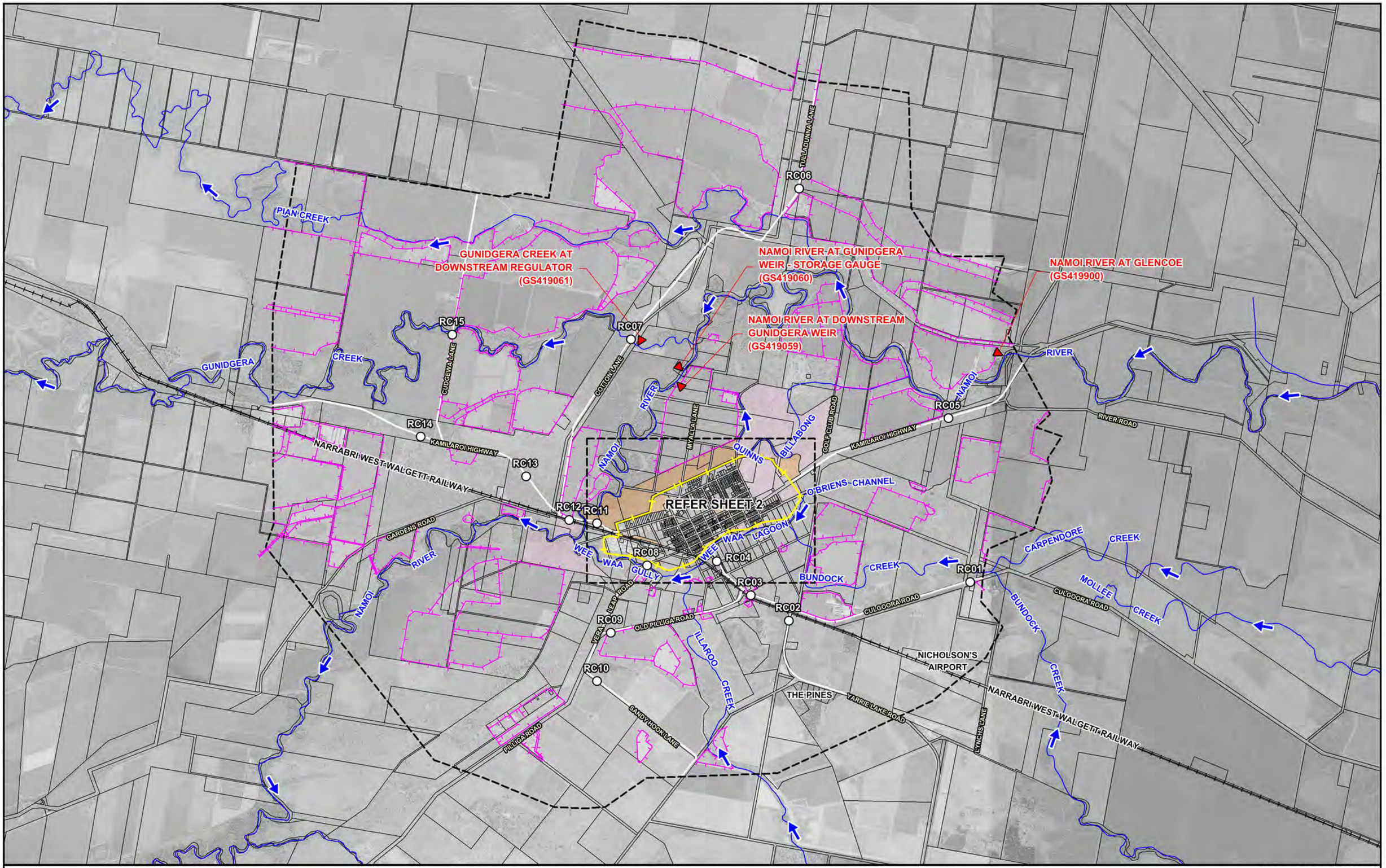
LEGEND

- WaterNSW Stream Gauge
- Wee Waa Levee
- Extent of Flood Study TUFLOW Model
- Extent of Namoi River TUFLOW Model
- Extent of Wee Waa Town LiDAR Survey Data
- Extent of AAMHATCH LiDAR Survey Data
- Extent of Narrabri North West LiDAR Survey Data
- Extent of GA_5m LiDAR Survey Data
- Extent of GA_1m LiDAR Survey Data

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 1.1

LOCATION PLAN



N

600 0 600 1200 1800 m

Scale: 1:60,000

LEGEND

- Two-Dimensional Model Boundary
- Crown Land
- Council Owned Land
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain
- WaterNSW Operated Stream Gauge
- RC01 Low Point in Major Road and Identifier

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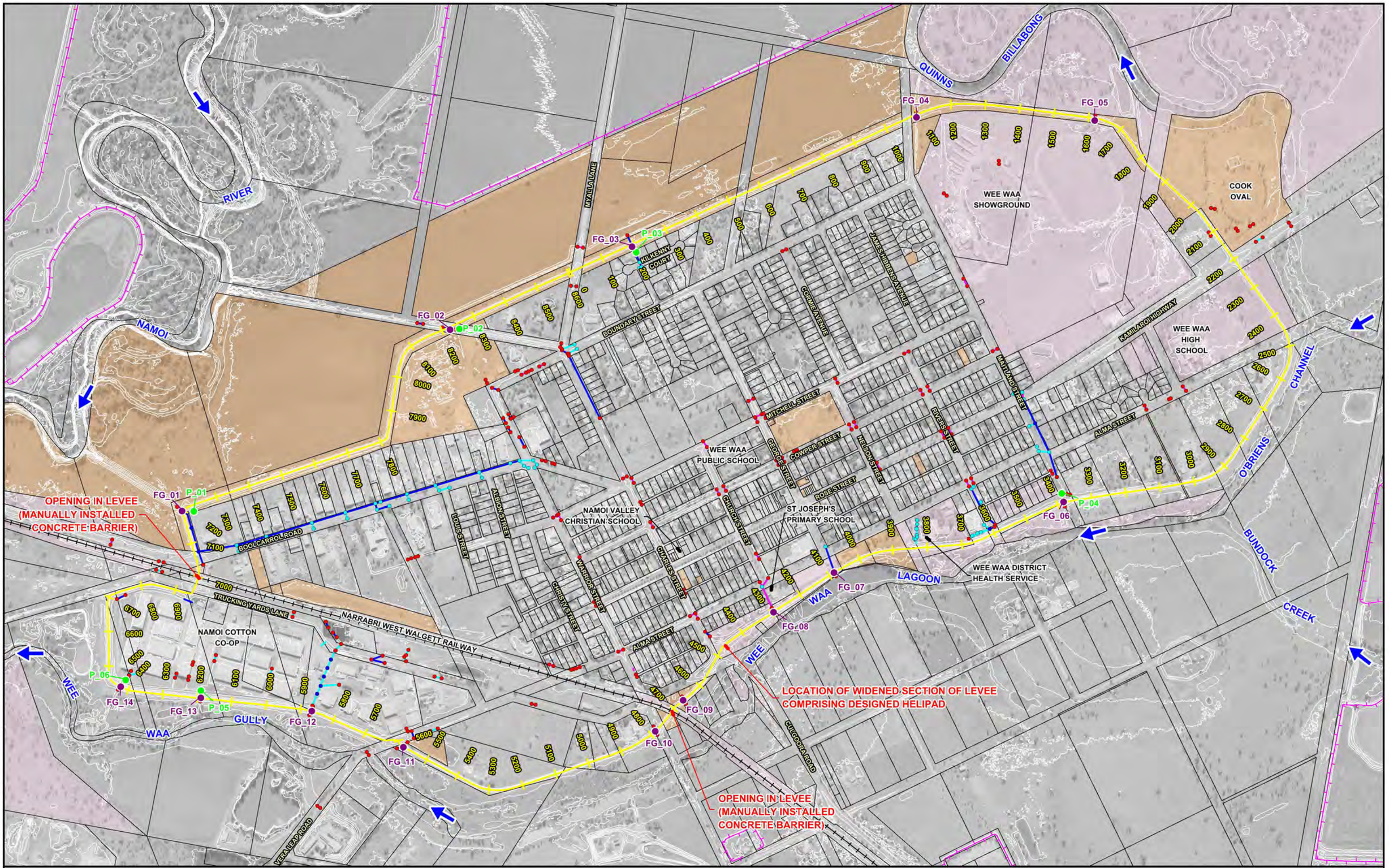
WEE WAA LEVEE
RISK MANAGEMENT STUDY PLAN

Figure 2.1
(Sheet 1 of 2)

LAYOUT OF EXISTING LEVEES AND STORMWATER DRAINAGE SYSTEM



N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

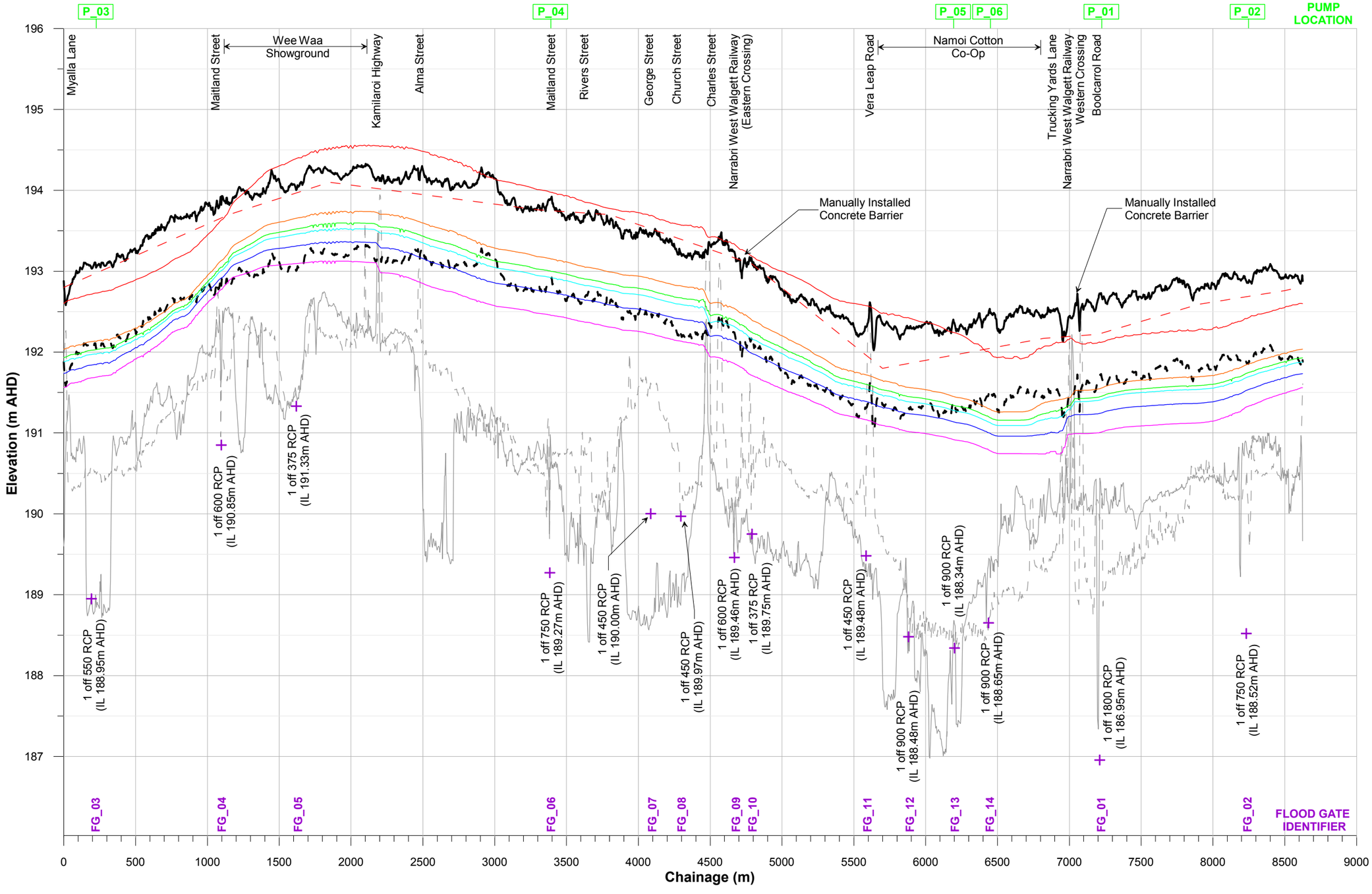
LEGEND

- Existing Levee Centre Line and Chainage
- Flood Gate Location and Identifier
- Pump Location and Identifier
- Junction Pit
- Inlet Pit
- Headwall
- Crown Land
- Council Owned Land
- Box Culvert
- Pipe (Diameter < 450 mm)
- Pipe (Diameter ≥ 450 mm)
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.1
(Sheet 2 of 2)

LAYOUT OF EXISTING LEVEES AND STORMWATER DRAINAGE SYSTEM



WATER SURFACE PROFILES

- Extreme Flood
- 0.2% AEP
- 0.5% AEP
- 1% AEP
- 2% AEP
- 5% AEP

GROUND PROFILES

- Crest of Existing Town Levee
- Imminent Failure Flood Level
- Toe of Levee (River Side)
- Toe of Levee (Town Side)
- Invert of Pipe
- Original Design Height (1971 Flood + 1 m)

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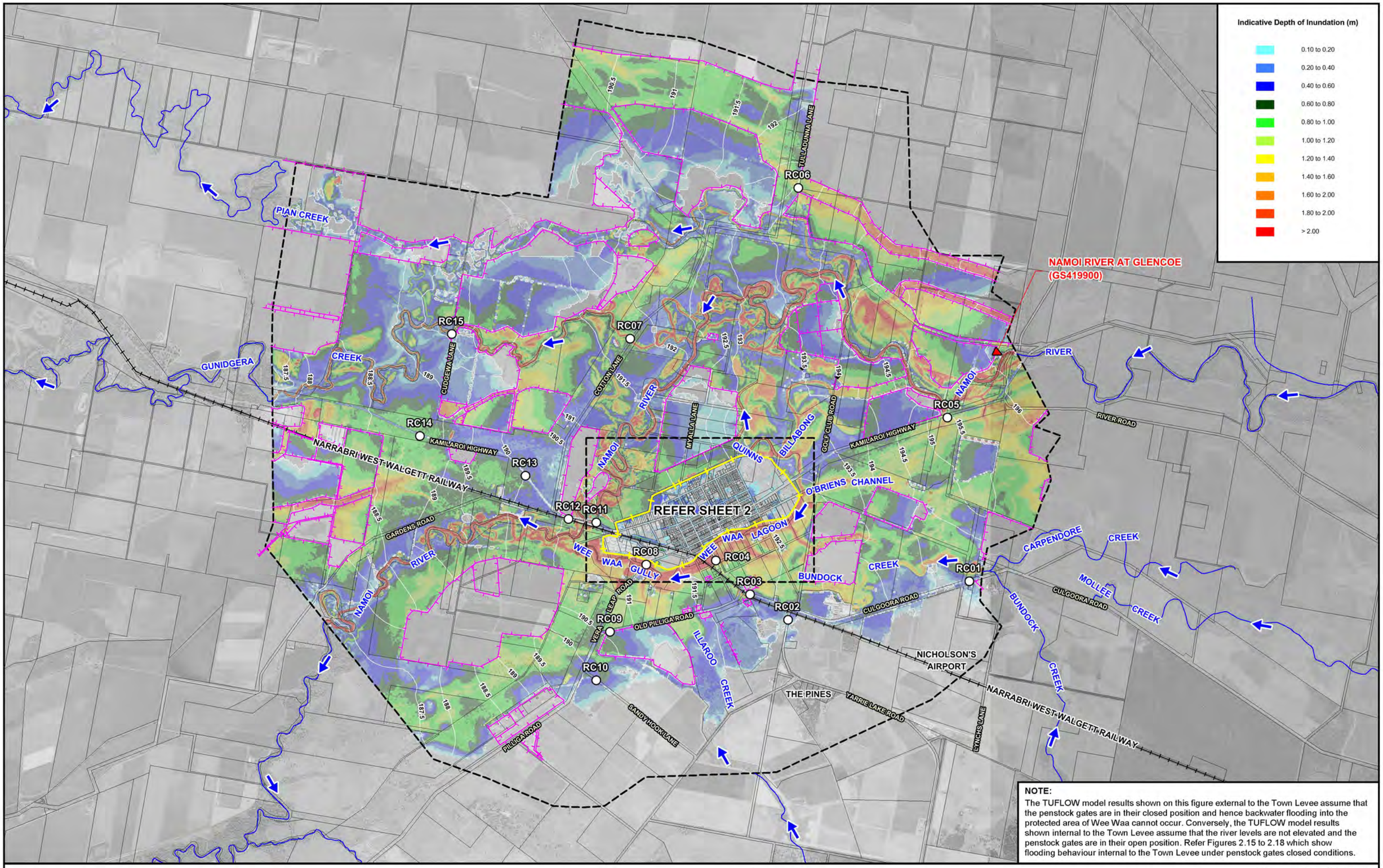
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.2

LONGITUDINAL SECTION ALONG CREST OF EXISTING TOWN LEVEE



N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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
- 196.0 Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.3
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
5% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
MYALL LANE
QUINNS
BILLABONG
CHANNEL
O'BRIENS
BUNDOCK
CREEK
LAGOON
WEE WAA
GULLY
WEE WAA SHOWGROUND
COOK OVAL
WEE WAA HIGH SCHOOL
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
NAMOI COTTON CO-OP
NARRABRI WEST WALGETT RAILWAY
BOOLCARROL ROAD
TRUCKING YARDS LANE
BOUNDARY STREET
KILKENNY COURT
JAMES HIBBENS AVENUE
CORMIE AVENUE
KAMILAROI HIGHWAY
MAITLAND STREET
RIVER STREET
ALMA STREET
MITCHELL STREET
COWPER STREET
NELSON STREET
GEORGE STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
CHRISTY STREET
WARRIOR STREET
ALBION STREET
LOUIS STREET
CULGOORA ROAD
VERALEAP ROAD
FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14
P_01 P_02 P_03 P_04 P_05 P_06

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
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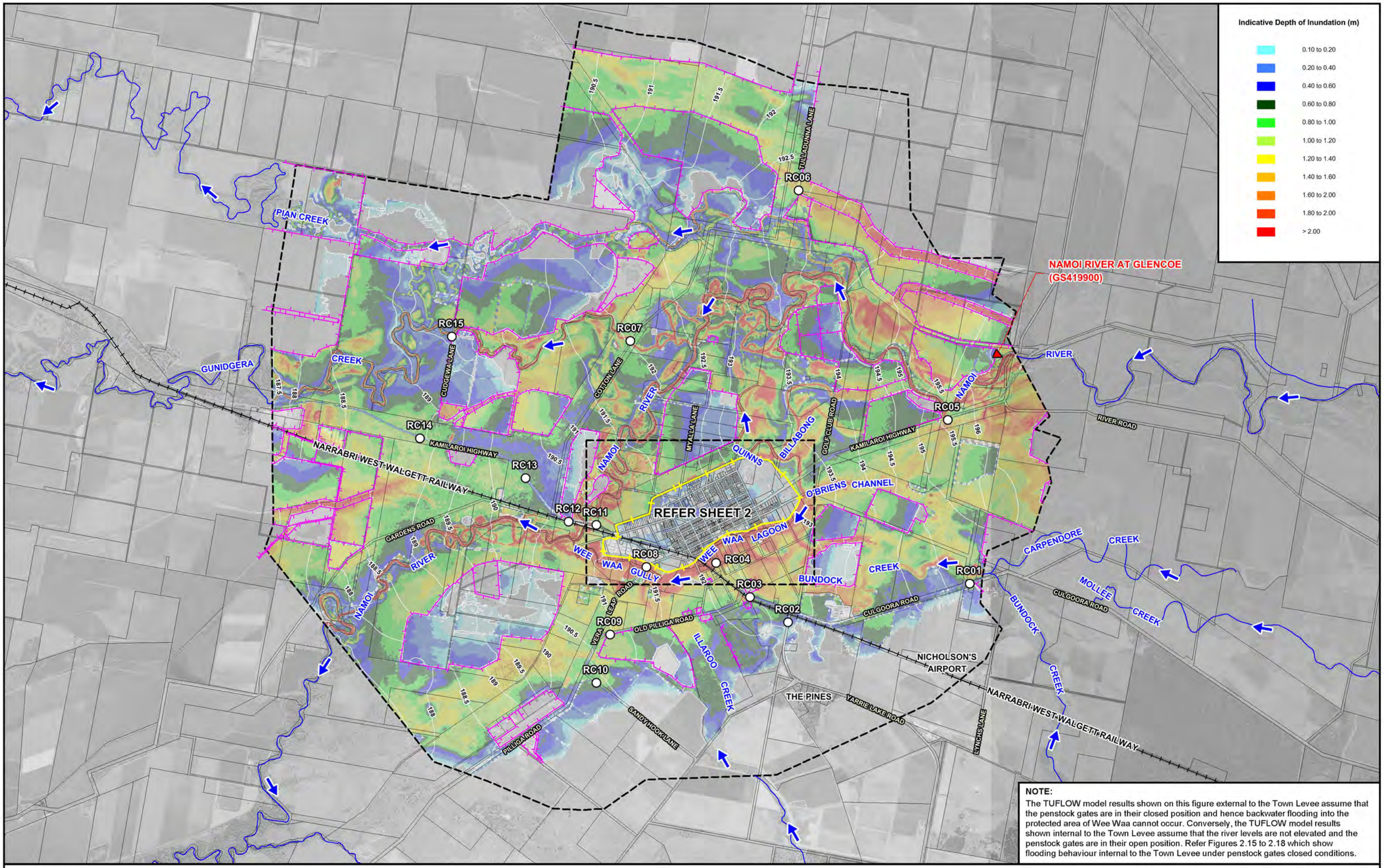
LEGEND

- Modelled Stormwater Network
- 196.0 Water Surface Elevation Contours (m AHD)
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.3
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
5% AEP



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N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

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LEGEND

- Two-Dimensional Model Boundary
- 196.0 Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.4
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
2% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
BILLABONG
QUINNS
MYALL LANE
WEE WAA SHOWGROUND
COOK OVAL
JAMES HIBBENS AVENUE
KILKENNY COURT
BOUNDARY STREET
CORMIE AVENUE
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
CHANNEL
O'BRIENS
MITCHELL STREET
RIVER STREET
ALMA STREET
WEE WAA PUBLIC SCHOOL
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
ALBION STREET
LOUIS STREET
CHURCH STREET
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WARRIOR STREET
CHRISTY STREET
CHARLES STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
WEE WAA DISTRICT HEALTH SERVICE
LAGOON
WAA WEE
BUNDOCK CREEK
GULLY WAA WEE
GULGOOA ROAD
VERA LEA ROAD
FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14
P_01 P_02 P_03 P_04 P_05 P_06

N

100 0 100 200 300 m

Scale: 1:10,000

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Note:
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LEGEND

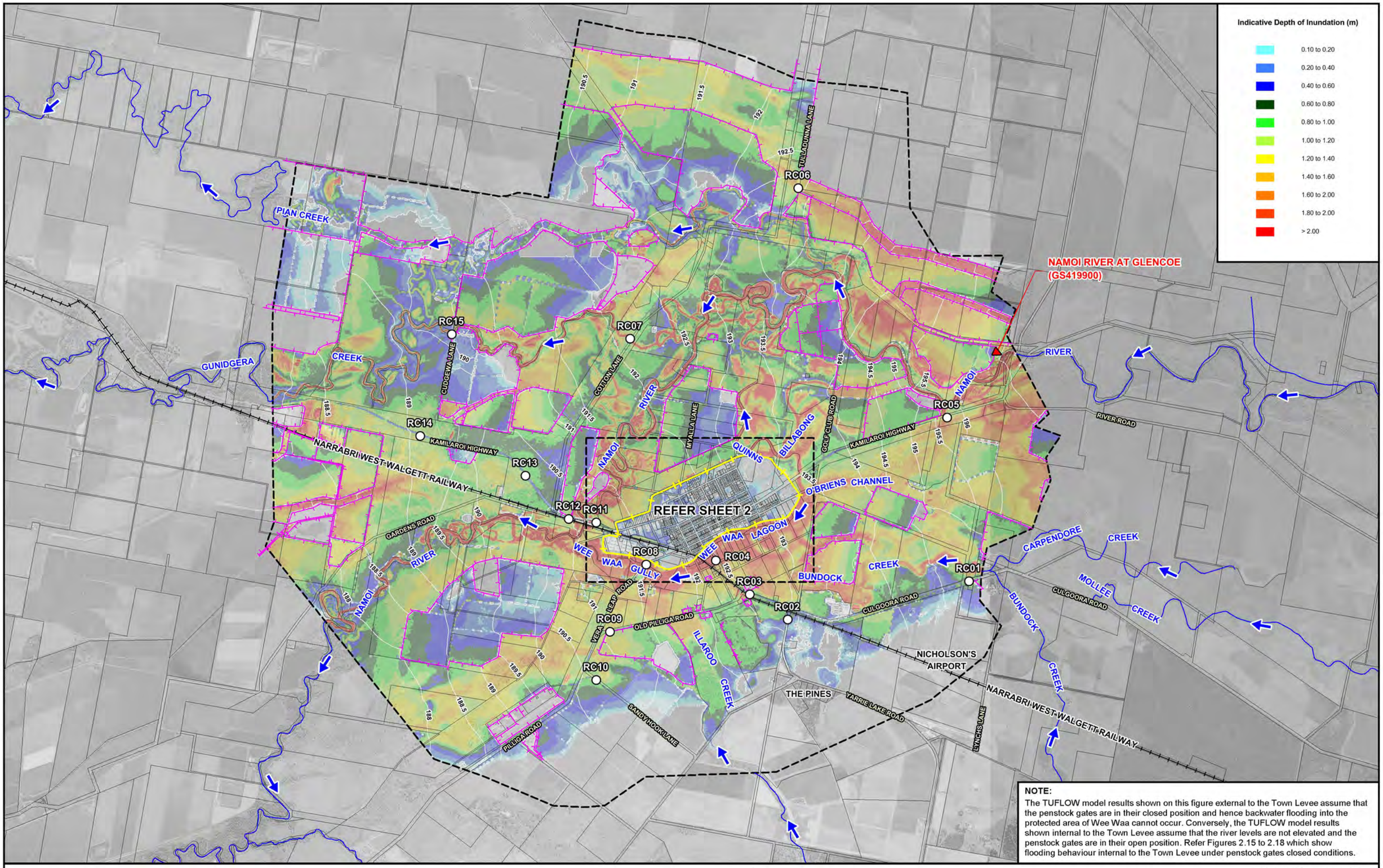
- Modelled Stormwater Network
- Water Surface Elevation Contours (m AHD) (196.0)
- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage (1000 1100)
- Flood Gate Location and Identifier (FG_01)
- Pump Location and Identifier (P_01)

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.4
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
2% AEP



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N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE RISK MANAGEMENT STUDY AND PLAN

Figure 2.5
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
1% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
WAA
GULLY
WEE
LAGOON
BUNDOCK
CREEK
CHANNEL
BILLABONG
QUINNS
O'BRIENS
MYALL LANE
BOUNDARY STREET
KILKENNY COURT
CORMIE AVENUE
JAMES HIBBENS AVENUE
MITCHELL STREET
GEORGE STREET
COWPER STREET
NELSON STREET
RIVES STREET
MAITLAND STREET
ALMA STREET
KAMILAROI HIGHWAY
ROSE STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
GULGOGA ROAD
VERALEA ROAD
WEE WAA SHOWGROUND
COOK OVAL
WEE WAA HIGH SCHOOL
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
NAMOI COTTON CO-OP
FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14
P_01 P_02 P_03 P_04 P_05 P_06

NOTE:
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N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
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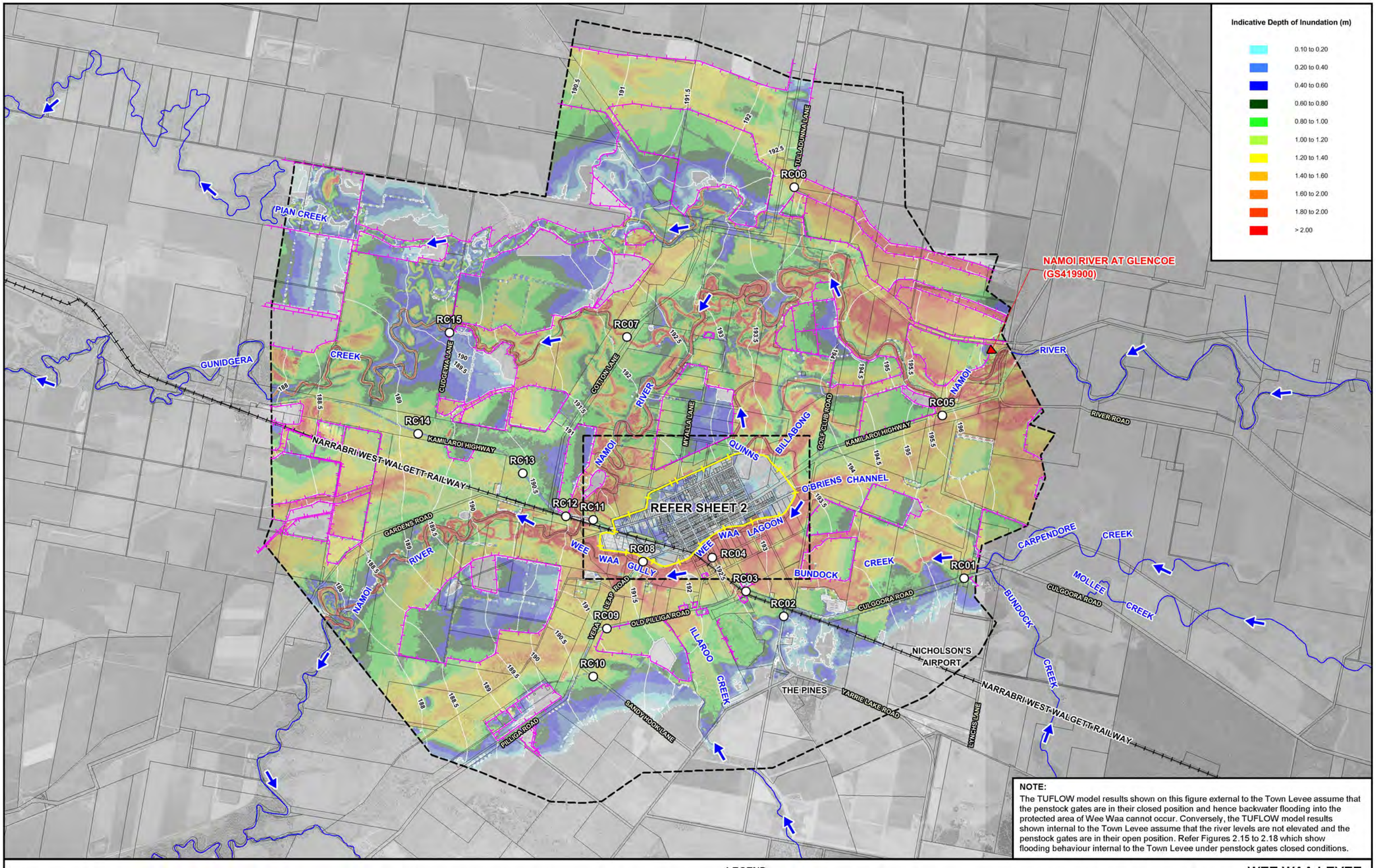
LEGEND

- Modelled Stormwater Network
- Water Surface Elevation Contours (m AHD) (196.0)
- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage (1000 1100)
- Flood Gate Location and Identifier (FG_01)
- Pump Location and Identifier (P_01)

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.5
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
1% AEP



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Note:
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LEGEND

- Two-Dimensional Model Boundary
- Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE RISK MANAGEMENT STUDY AND PLAN

Figure 2.6
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
0.5% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
WEE WAA GULLY
BILLABONG
QUINNS
CHANNEL
O'BRIENS
BUNDOCK CREEK
WEE WAA LAGOON
MYALL LANE
BOUNDARY STREET
KILKENNY COURT
CORMIE AVENUE
JAMES HIBBENS AVENUE
KAMILAROI HIGHWAY
MAITLAND STREET
MITCHELL STREET
RIVER STREET
ALMA STREET
COWPER STREET
ROSE STREET
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NELSON STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST-WALGETT RAILWAY
GUILGOORA ROAD
VERALEAP ROAD
WEE WAA SHOWGROUND
COOK OVAL
WEE WAA HIGH SCHOOL
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
NAMOI COTTON CO-OP
FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14
P_01 P_02 P_03 P_04 P_05 P_06

NOTE:
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N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

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LEGEND

- Modelled Stormwater Network
- 196.0 Water Surface Elevation Contours (m AHD)
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.6
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
0.5% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

PIAN CREEK
GUNIDGERA CREEK
NAMOI RIVER AT GLENCOE (GS419900)
NAMOI RIVER
RIVER ROAD
RC01
RC02
RC03
RC04
RC05
RC06
RC07
RC08
RC09
RC10
RC11
RC12
RC13
RC14
RC15
REFER SHEET 2
TULLADUNNA LANE
GOTTON LANE
CUDGEWA LANE
KAMILAROI HIGHWAY
NARRABRI WEST-WALGETT RAILWAY
GARDENS ROAD
GOLF CLUB ROAD
BILLABONG
QUINNS
O'BRIENS CHANNEL
WEE WAA LAGOON
WEE WAA GULLY
BUNDOCK CREEK
CARPENDORE CREEK
MOLLEE CREEK
CULGOORA ROAD
OLD PILLIGA ROAD
LEAP ROAD
VERA
ILLAROO CREEK
NICHOLSON'S AIRPORT
THE PINES
YARRIE LAKE ROAD
LYNCHS LANE
SANDY HOOK LANE
PILLIGA ROAD

NOTE:
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N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

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LEGEND

- Two-Dimensional Model Boundary
- Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE RISK MANAGEMENT STUDY AND PLAN

Figure 2.7
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
0.2% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
QUINNS
BILLABONG
CHANNEL
O'BRIENS
BUNDOCK
CREEK
LAGOON
WEE WAA
GULLY
MYALL LANE
BOUNDARY STREET
KILKENNY COURT
JAMES HIBBENS AVENUE
CORMIE AVENUE
MAITLAND STREET
KAMILAROI HIGHWAY
MITCHELL STREET
RIVES STREET
ALMA STREET
COWPER STREET
GEORGE STREET
NELSON STREET
ROSS STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST-WALGETT RAILWAY
GUILGOORA ROAD
VERALEAP ROAD
WEE WAA SHOWGROUND
COOK OVAL
WEE WAA HIGH SCHOOL
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
NAMOI COTTON CO-OP
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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

- Modelled Stormwater Network
- 196.0 — Water Surface Elevation Contours (m AHD)
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 — Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.7
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
0.2% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

PIAN CREEK
GUNIDGERA CREEK
NAMOI RIVER AT GLENCOE (GS419900)
NAMOI RIVER
RIVER ROAD
RC01
RC02
RC03
RC04
RC05
RC06
RC07
RC08
RC09
RC10
RC11
RC12
RC13
RC14
RC15
REFER SHEET 2
TULLADINNA LANE
GUDGEWA LANE
COTTON LANE
IXALLA LANE
GOLF CLUB ROAD
KAMILAROI HIGHWAY
NARRABRI WEST-WALGETT RAILWAY
QUINNS BILLABONG
O'BRIENS CHANNEL
WEE WAA LAGOON
WEE WAA GULLY
GARDENS ROAD
LEAP ROAD
OLD PILLIGA ROAD
VERA
ILLAROO CREEK
SANDY HOOK LANE
PILLIGA ROAD
BUNDOCK CREEK
CARPENDORE CREEK
MOLLEE CREEK
CULGOORA ROAD
NICHOLSON'S AIRPORT
THE PINES
YARRIE LAKE ROAD
LYNCHS LANE

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- 196.0 Water Surface Elevation Contours (m AHD)
- RC01 WaterNSW Stream Gauge
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE RISK MANAGEMENT STUDY AND PLAN

Figure 2.8
(Sheet 1 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
EXTREME FLOOD

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
MYALL LANE
QUINNS
BILLABONG
CHANNEL
O'BRIENS
BUNDOCK
CREEK
LAGOON
WEE WAA
WEE WAA GULLY
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06
WEE WAA SHOWGROUND
COOK OVAL
WEE WAA HIGH SCHOOL
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
NAMOI COTTON CO-OP
KILKENNY COURT
BOUNDARY STREET
CORMIE AVENUE
JAMES HIBBENS AVENUE
KAMILAROI HIGHWAY
MAITLAND STREET
MITCHELL STREET
COWPER STREET
GEORGE STREET
NELSON STREET
RIVER STREET
ALMA STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
GULGOORA ROAD
VERAL LEAP ROAD

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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

- Modelled Stormwater Network
- 196.0 — Water Surface Elevation Contours (m AHD)
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 — Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.8
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTHS OF INUNDATION
EXTREME FLOOD

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER

NAMOI

QUINNS

BILLABONG

MYALL LANE

FG_01 P_01 FG_02 P_02 FG_03 P_03 FG_04 FG_05 FG_06 P_04 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 P_05 FG_14 P_06

BOOLCARROL ROAD

BOUNDARY STREET

KILKENNY COURT

JAMES HIBBENS AVENUE

CORMIE AVENUE

WEE WAA SHOWGROUND

COOK OVAL

KAMILAROI HIGHWAY

WEE WAA HIGH SCHOOL

MAITLAND STREET

RIVER STREET

ALMA STREET

CHANNEL

O'BRIENS

BUNDOCK CREEK

LAGOON

WEE WAA

WEE WAA PUBLIC SCHOOL

MITCHELL STREET

GEORGE STREET

COWPER STREET

NELSON STREET

ROSE STREET

CHURCH STREET

CHARLES STREET

ST JOSEPH'S PRIMARY SCHOOL

WEE WAA DISTRICT HEALTH SERVICE

NAMOI VALLEY CHRISTIAN SCHOOL

ALBION STREET

LOUIS STREET

WARRIOR STREET

CHRISTY STREET

TRUCKING YARDS LANE

NARRABRI WEST WALGETT RAILWAY

NAMOI COTTON CO-OP

GULLY

WAA

WEE

GUNNEDAH ROAD

VERALEAP ROAD

NOTE:
The TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m 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.

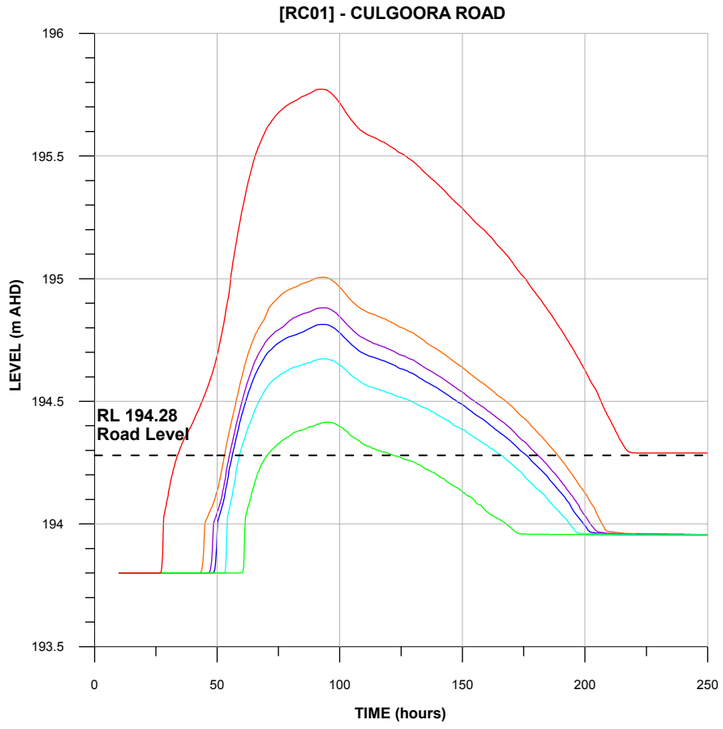
LEGEND

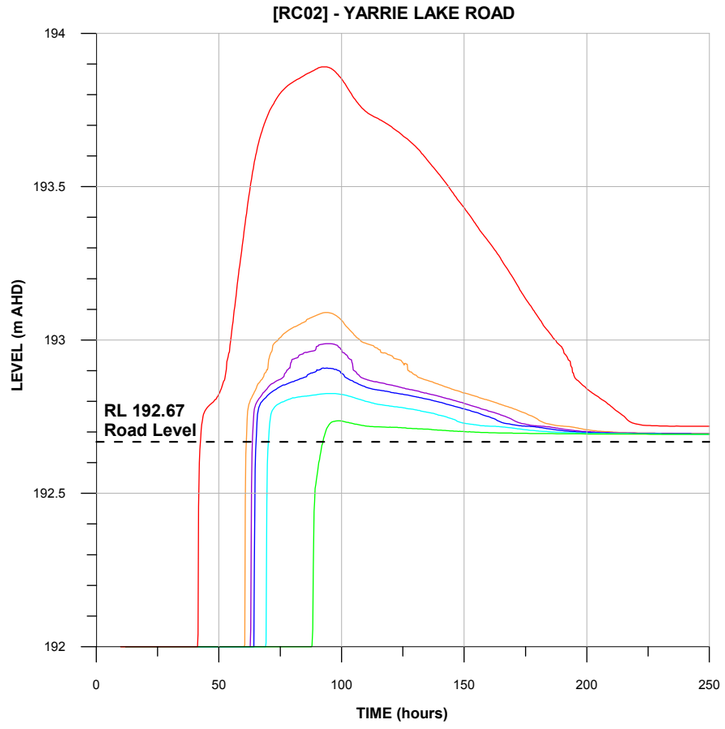
- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 — Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

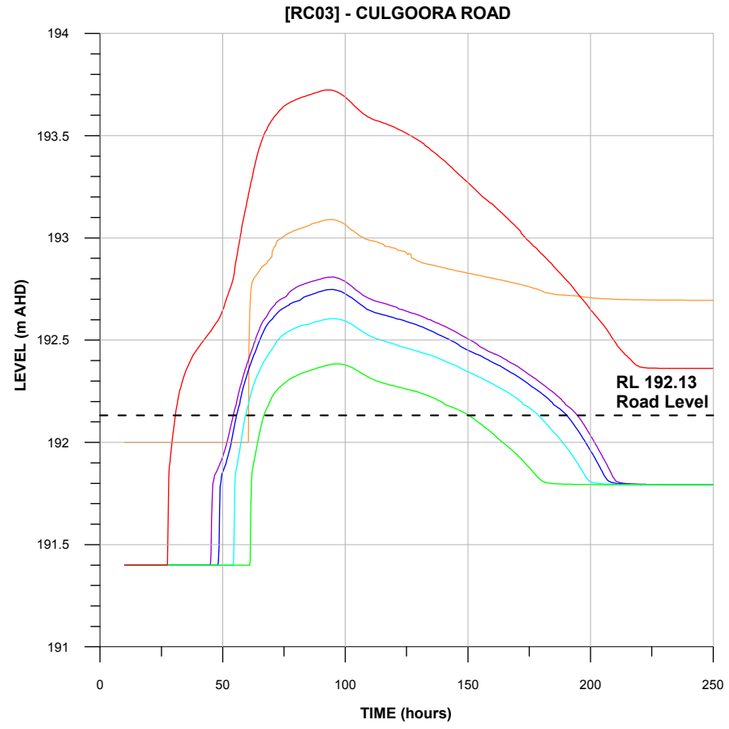
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

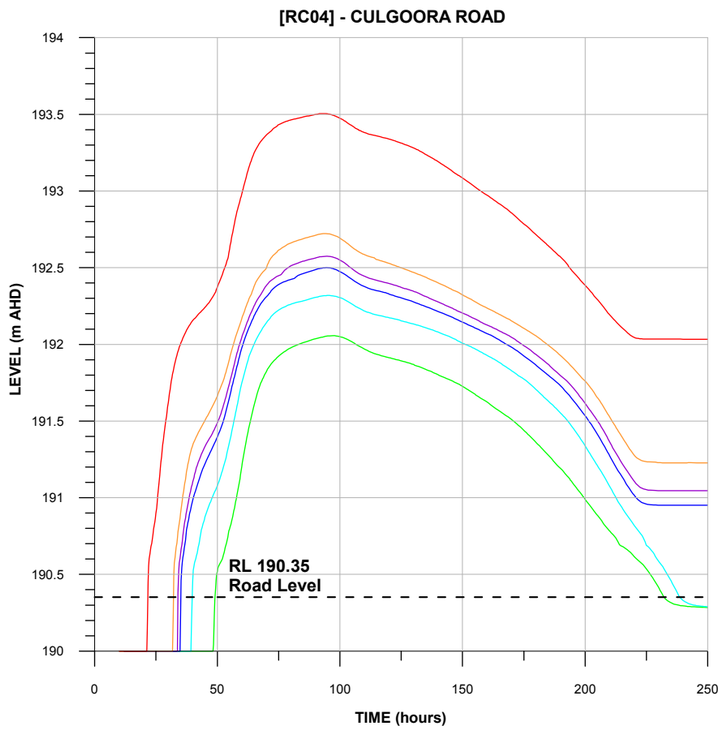
Figure 2.9

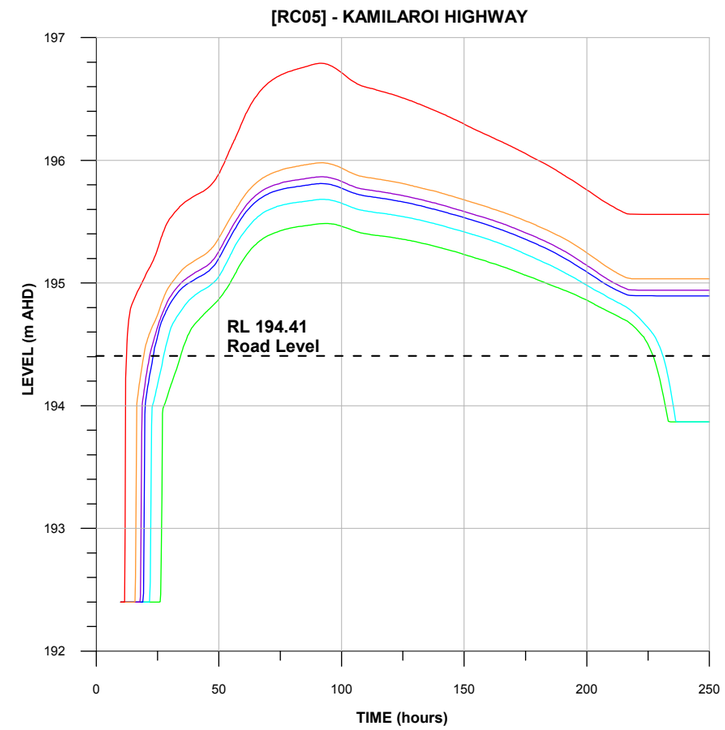
INDICATIVE EXTENT AND DEPTHS OF INUNDATION INTERNAL TO TOWN LEVEE - PMF

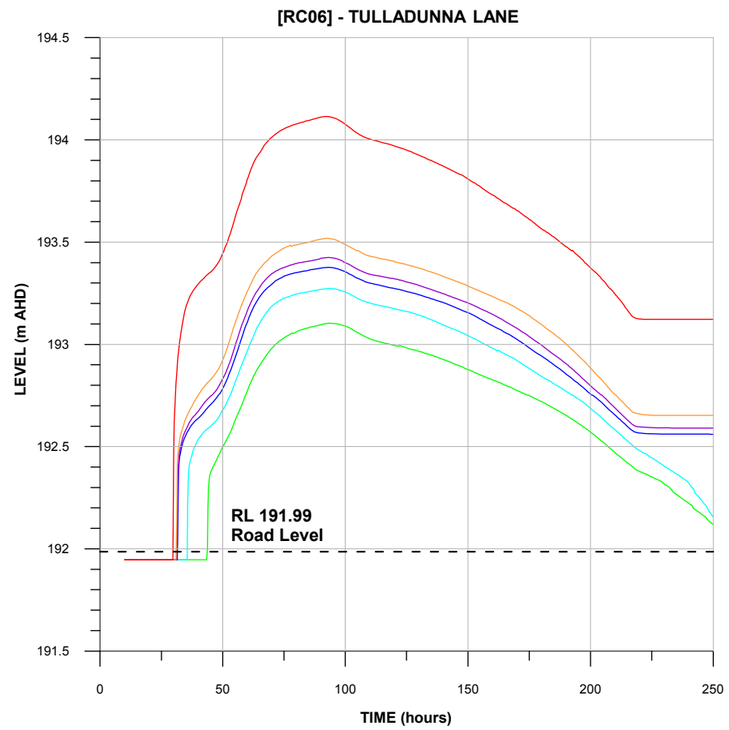


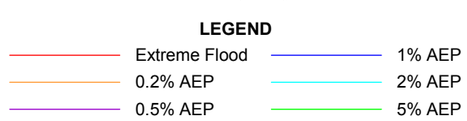












Lyall & Associates

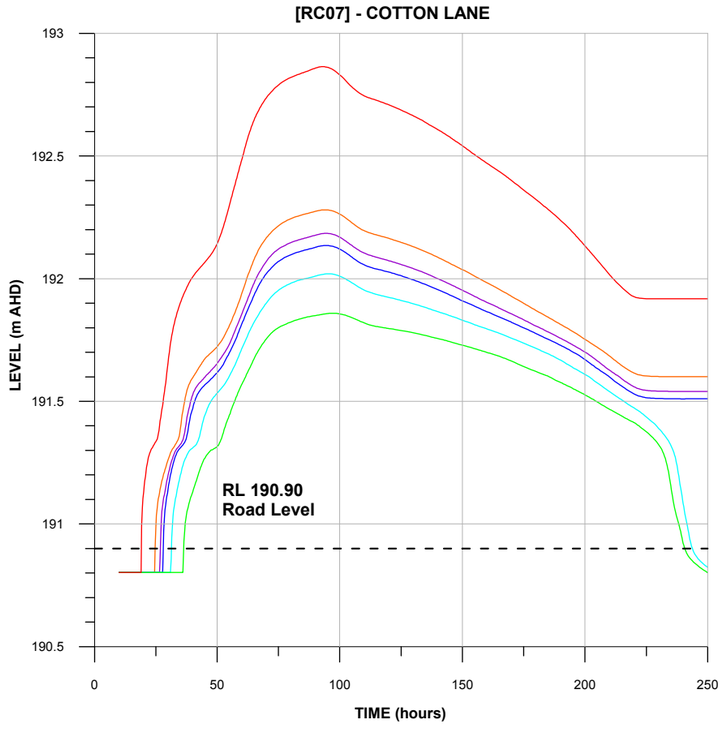
NOTE:

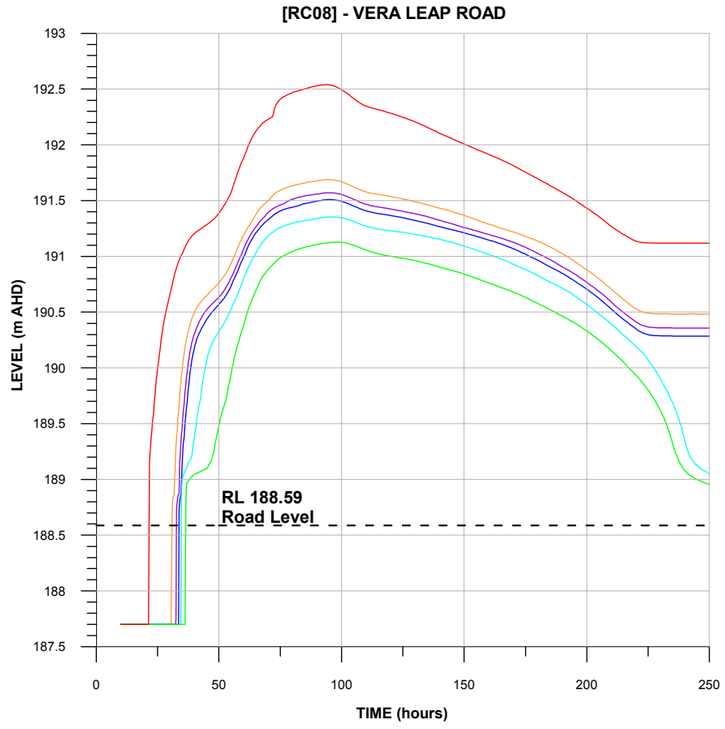
Refer **Figure 2.3 Sheet 1** for location of hydrographs.

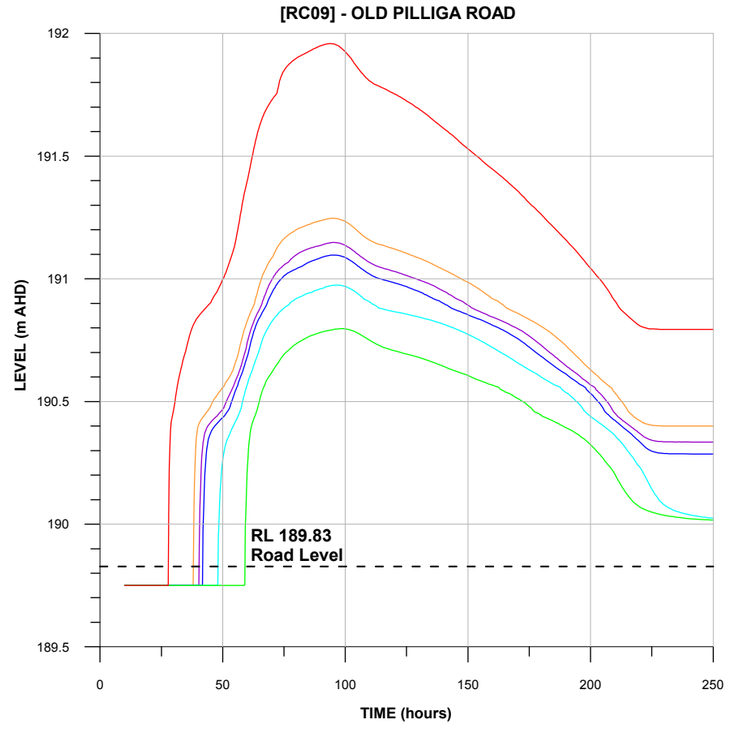
WEE WAA LEVEE
RISK MANAGEMENT STUDY PLAN

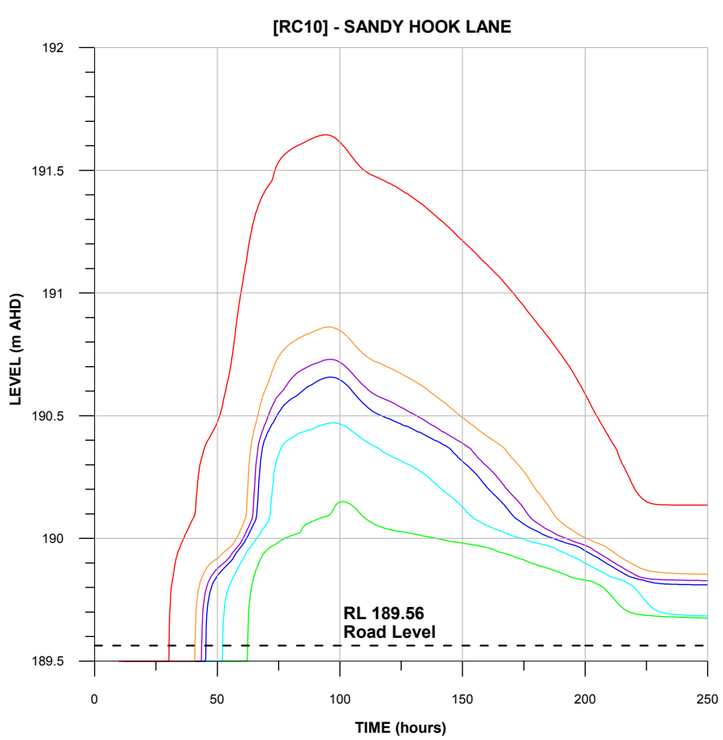
Figure 2.10
(Sheet 1 of 3)

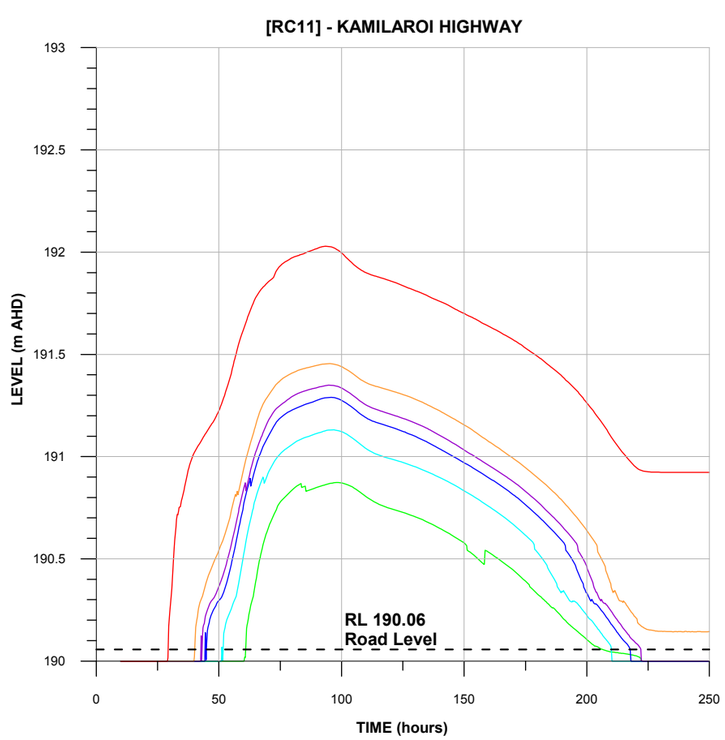
TIME OF RISE OF FLOODWATERS

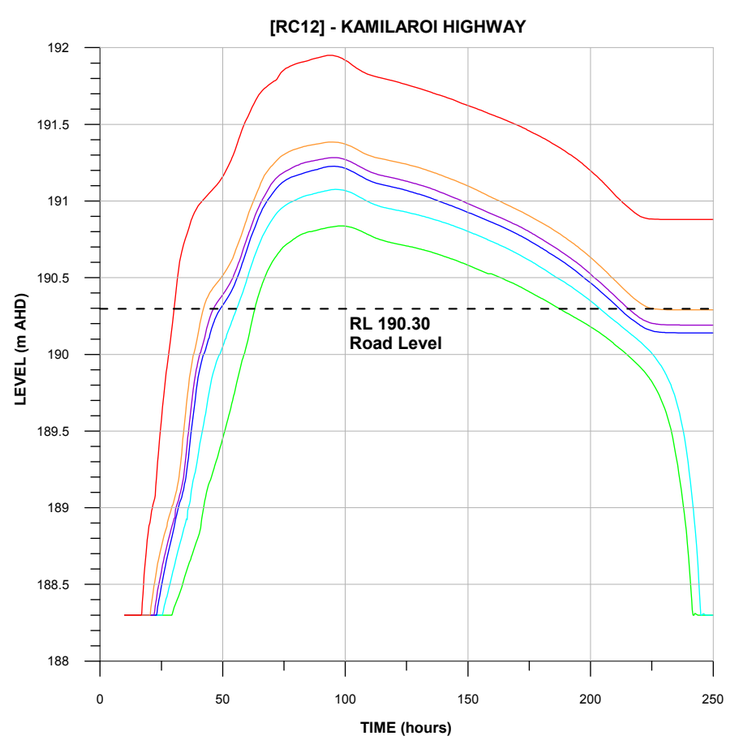


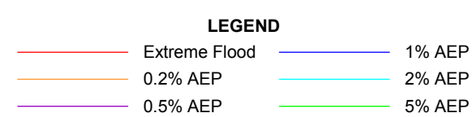












Lyall & Associates

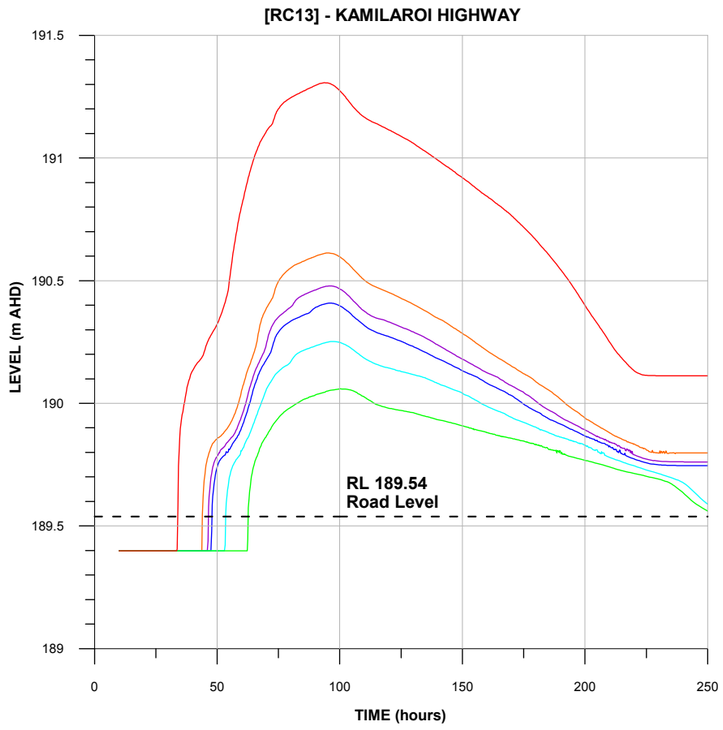
NOTE:

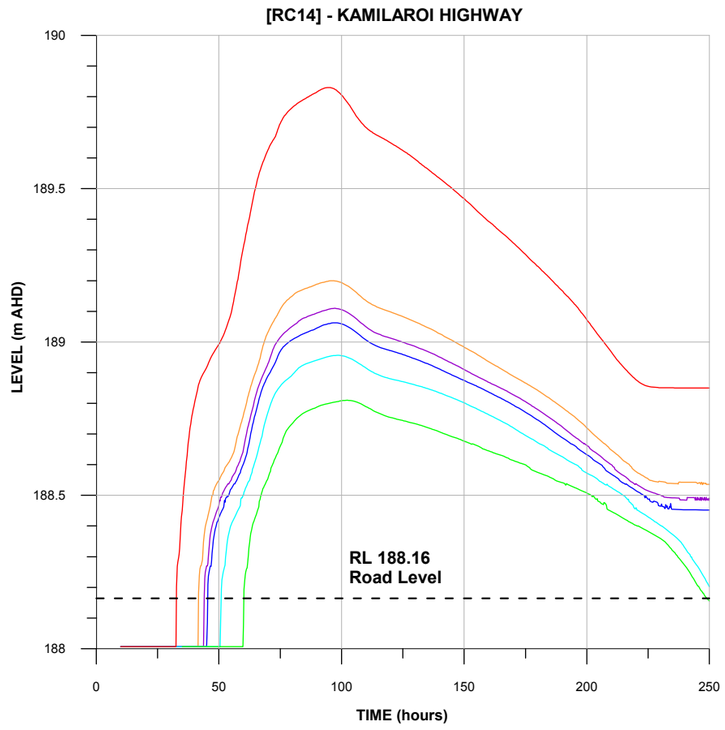
Refer **Figure 2.3 Sheet 1** for location of hydrographs.

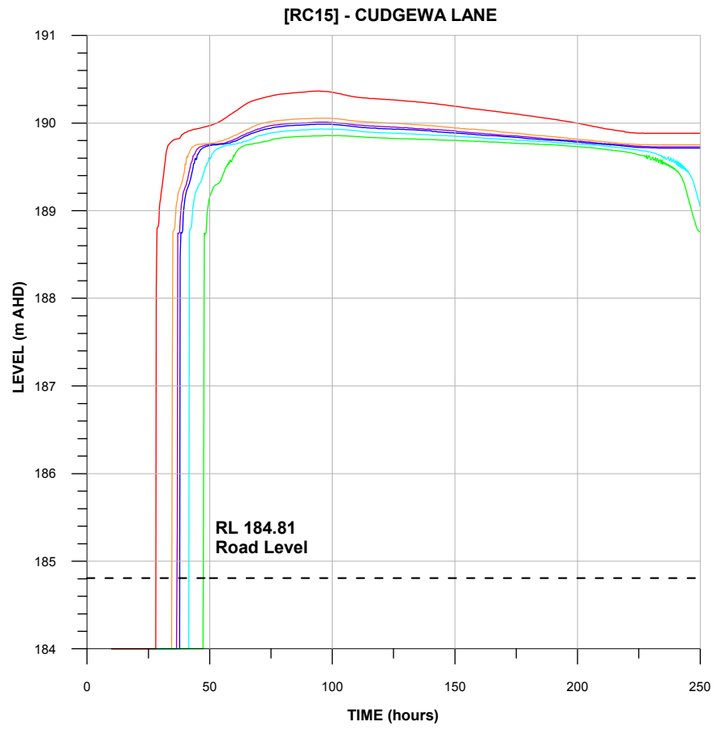
WEE WAA LEVEE
RISK MANAGEMENT STUDY PLAN

Figure 2.10
(Sheet 2 of 3)

TIME OF RISE OF FLOODWATERS







Lyall & Associates

NOTE:

Refer **Figure 2.3 Sheet 1** for location of hydrographs.

WEE WAA LEVEE
RISK MANAGEMENT STUDY PLAN

Figure 2.10
(Sheet 3 of 3)

TIME OF RISE OF FLOODWATERS

EXTENT OF INUNDATION

- 5% AEP
- 1% AEP
- PMF

NOTE:
Extents trimmed to areas inundated to depths greater than 100mm.

COMMUNITY ASSET

- Electricity Substation
- Telephone Exchange
- Sewage Treatment Plant
- Major Road Crossing and Identifier
- Water Supply

EMERGENCY SERVICES	VULNERABLE DEVELOPMENT
RFS Station	Educational Facility
Police Station	Chid Care Facility
F&R NSW Station	Caravan Park
Ambulance Facility	Aged Care Facility
SES Station	Hospital

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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.

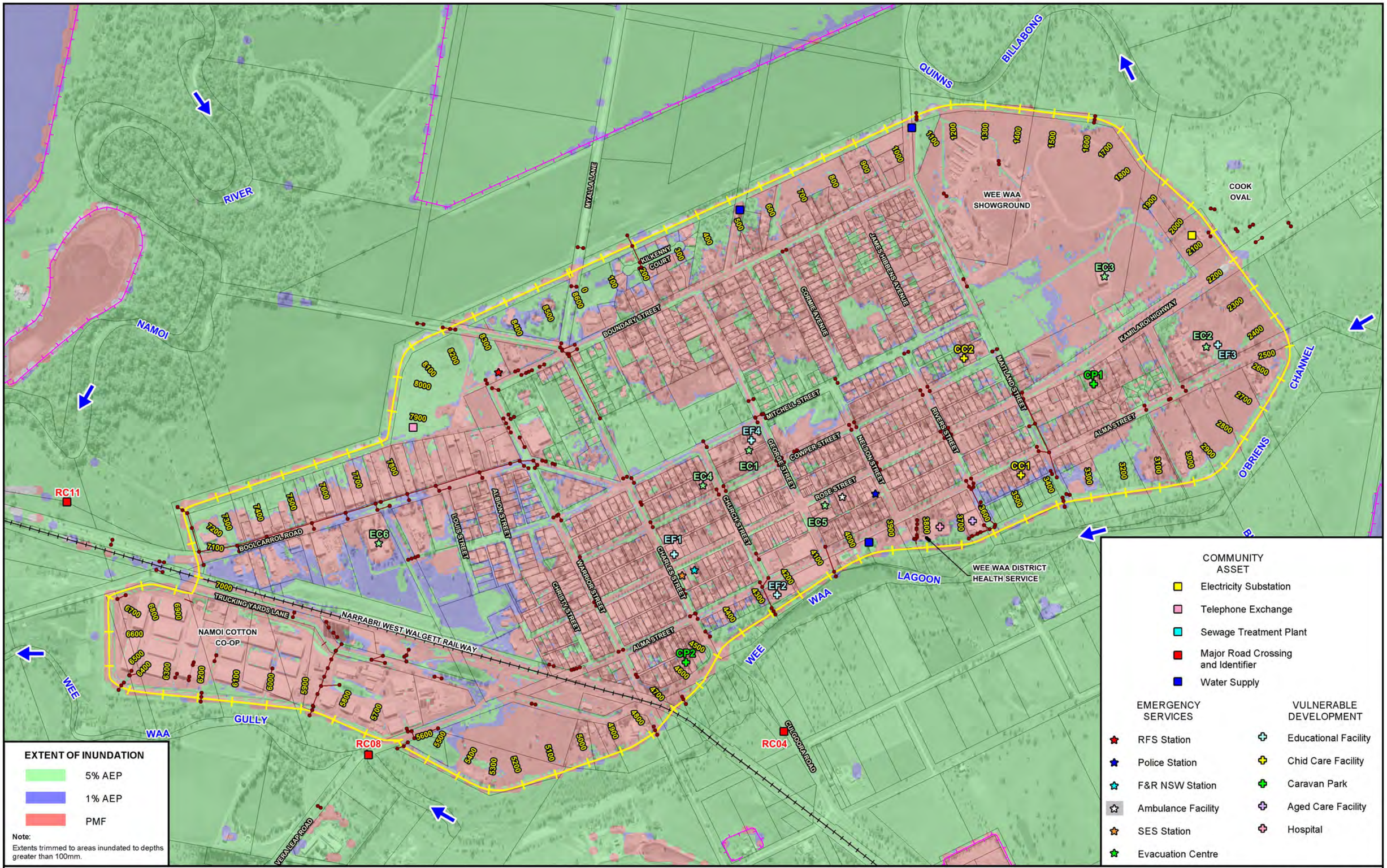
LEGEND

- Two-Dimensional Model Boundary
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain
- WaterNSW Operated Stream Gauge

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.11
(Sheet 1 of 2)

INDICATIVE EXTENT OF INUNDATION AND LOCATION OF VULNERABLE DEVELOPMENT AND CRITICAL INFRASTRUCTURE



EXTENT OF INUNDATION

- 5% AEP
- 1% AEP
- PMF

Note:
Extents trimmed to areas inundated to depths greater than 100mm.

COMMUNITY ASSET

- Electricity Substation
- Telephone Exchange
- Sewage Treatment Plant
- Major Road Crossing and Identifier
- Water Supply

EMERGENCY SERVICES	VULNERABLE DEVELOPMENT
RFS Station	Educational Facility
Police Station	Chid Care Facility
F&R NSW Station	Caravan Park
Ambulance Facility	Aged Care Facility
SES Station	Hospital
Evacuation Centre	

N

100 0 100 200 300 m

Scale: 1:10,000

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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

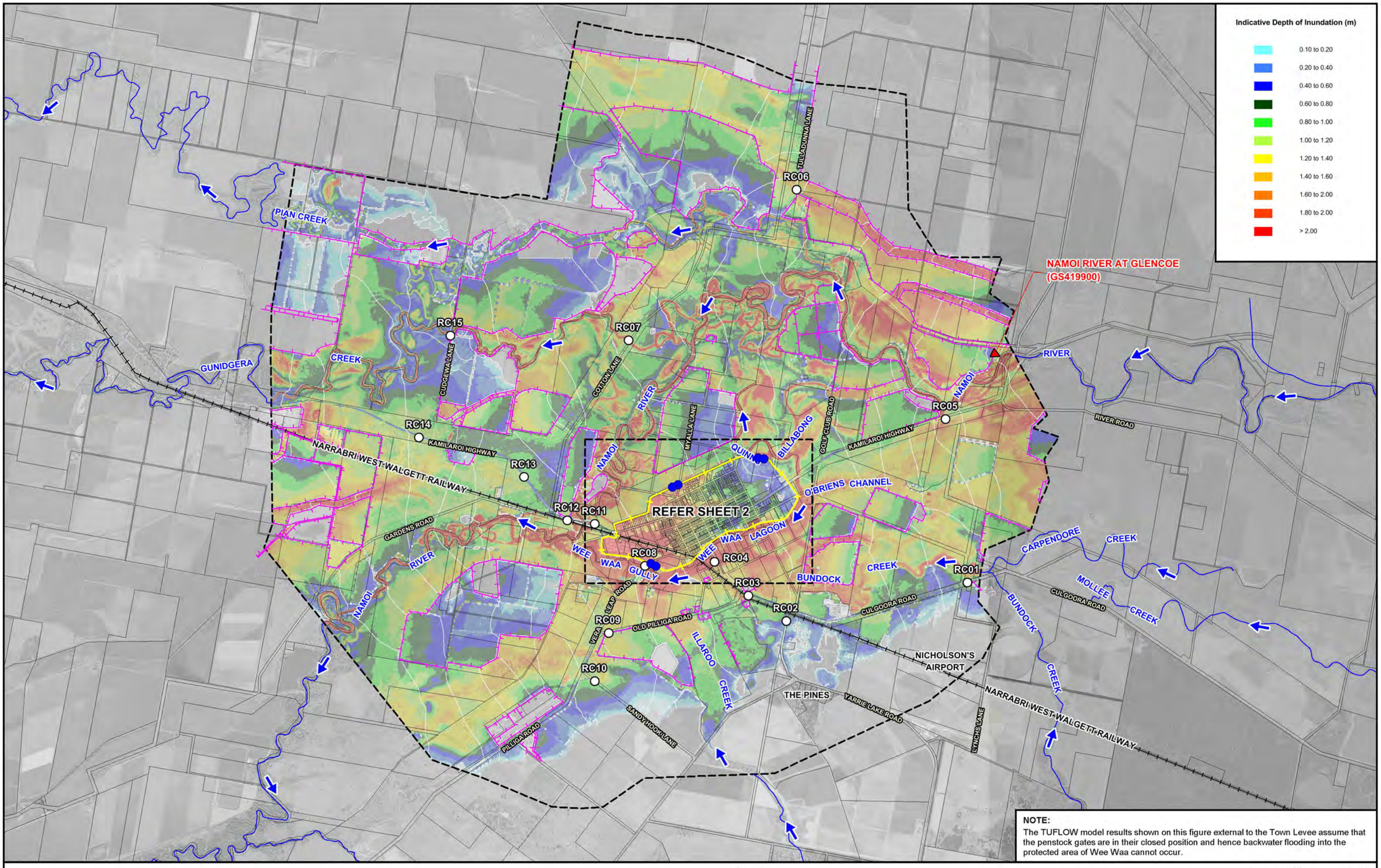
- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage

Lyall & Associates

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.11
(Sheet 2 of 2)

INDICATIVE EXTENT OF INUNDATION AND LOCATION OF VULNERABLE DEVELOPMENT AND CRITICAL INFRASTRUCTURE



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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
- 196.0 Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain
- Failed Section of Levee

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.12
(Sheet 1 of 2)

FLOODING BEHAVIOUR RESULTING FROM PARTIAL FAILURE OF TOWN LEVEE - 1% AEP NAMOI RIVER FLOOD

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
QUINNS
BILLABONG
MYALL LANE
BOUNDARY STREET
KILKENNY COURT
CORMIE AVENUE
JAMES HIBBENS AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
MITCHELL STREET
RIVERS STREET
ALMA STREET
CHANNEL
O'BRIENS
WEE WAA PUBLIC SCHOOL
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
ALBION STREET
LOUIS STREET
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WARRIOR STREET
CHRISTY STREET
CHARLES STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
WEE WAA DISTRICT HEALTH SERVICE
LAGOON
WAA
WEE
GULLY
GULGOORA ROAD
VERALEA ROAD
BUNDOCK CREEK

FG_01 P_01 FG_02 P_02 FG_03 P_03 FG_04 FG_05 FG_06 P_04 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 P_05 FG_14 P_06

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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

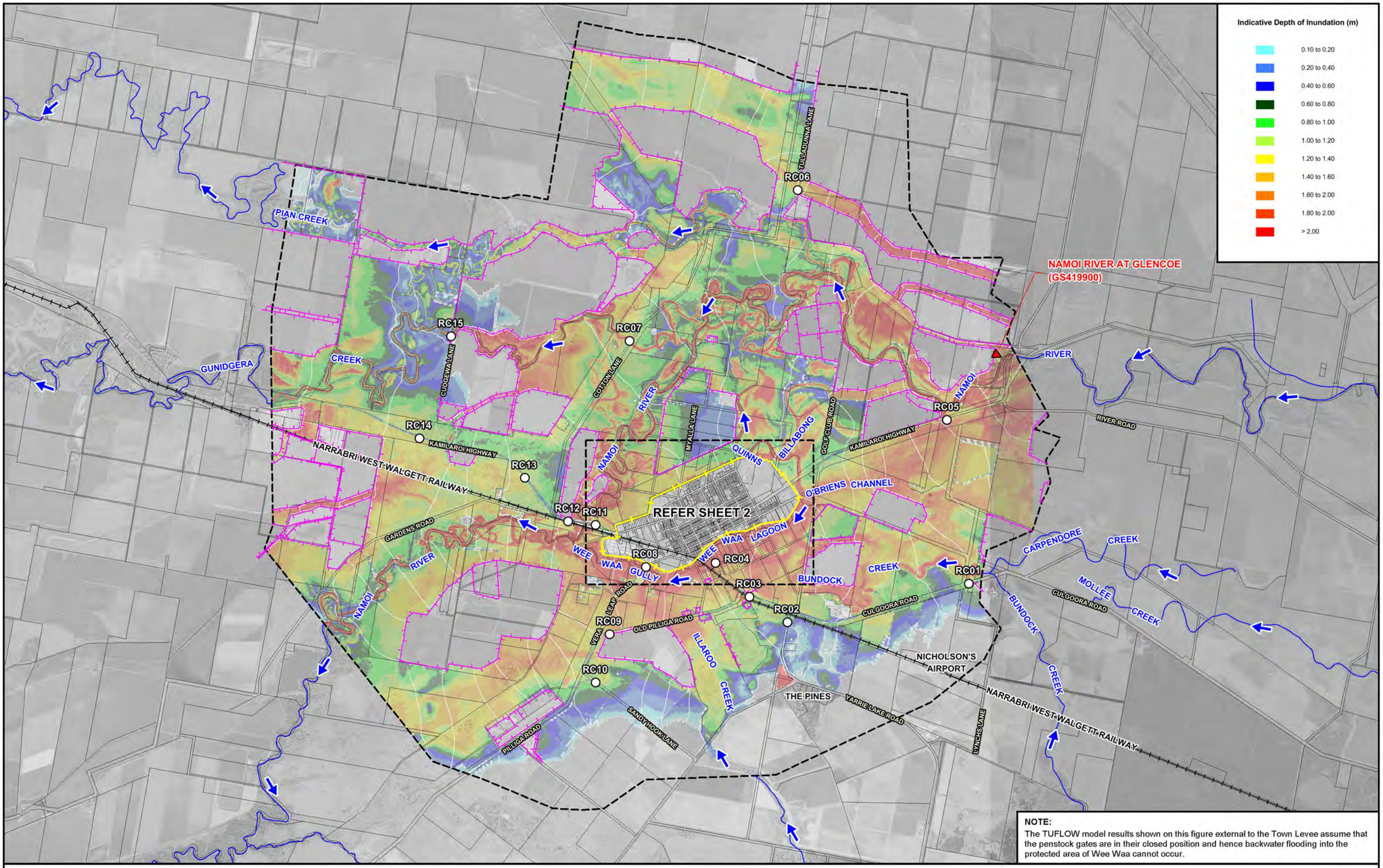
- 196.0 — Water Surface Elevation Contours (m AHD)
- Existing Rural Levees on Namoi River Floodplain
- Failed Section of Levee
- 1000 1000 — Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.12
(Sheet 2 of 2)

FLOODING BEHAVIOUR RESULTING FROM PARTIAL FAILURE OF TOWN LEVEE - 1% AEP NAMOI RIVER FLOOD



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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
- Water Surface Elevation Contours (m AHD)
- WaterNSW Stream Gauge
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.13
(Sheet 1 of 2)

TUFLOW MODEL RESULTS
1% AEP NAMOI RIVER FLOOD - RAISED RURAL LEVEES

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

RIVER
NAMOI
QUINNS
BILLABONG
MYALLA LANE
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06
KILKENNY COURT
BOUNDARY STREET
CORMIE AVENUE
JAMES HIBBENS AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
MITCHELL STREET
RIVERS STREET
ALMA STREET
CHANNEL
O'BRIENS
WEE WAA PUBLIC SCHOOL
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
ALBION STREET
LOUIS STREET
WARRIOR STREET
CHRISTY STREET
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
GULLY
WAA
WEE
LAGOON
BUNDOCK
CREEK
GUILGOORA ROAD
VERA LEAP ROAD

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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

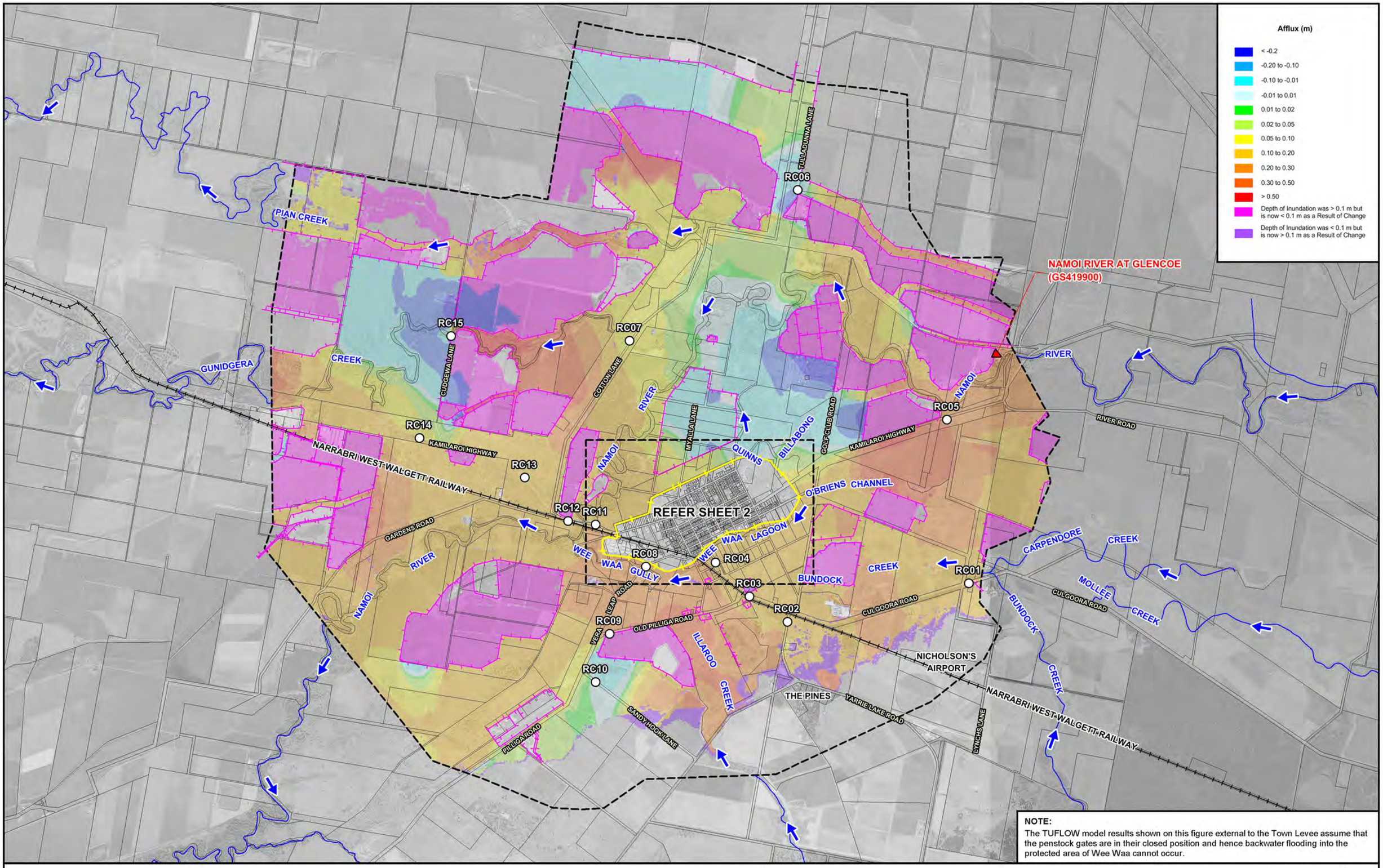
- 196.0 — Water Surface Elevation Contours (m AHD)
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 — Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.13
(Sheet 2 of 2)

TUFLOW MODEL RESULTS
1% AEP NAMOI RIVER FLOOD - RAISED RURAL LEVEES



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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.

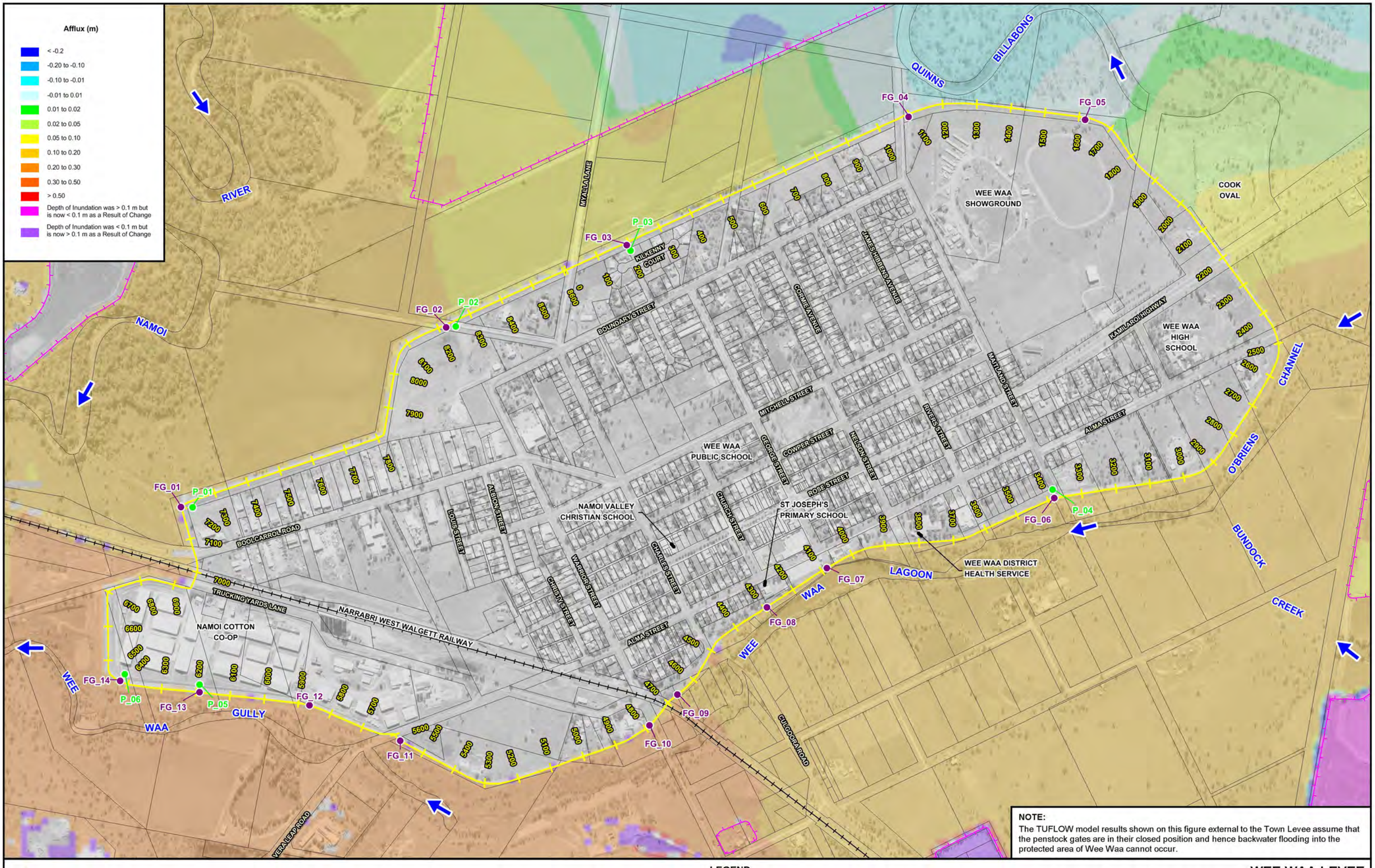
LEGEND

- Two-Dimensional Model Boundary
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.14
(Sheet 1 of 2)

POTENTIAL IMPACT OF RAISED RURAL LEVEES ON FLOODING BEHAVIOUR
1% AEP NAMOI RIVER FLOOD



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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

- Existing Town Levee Centre Line and Chainage
- Existing Rural Levees on Namoi River Floodplain
- Flood Gate Location and Identifier
- Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.14
(Sheet 2 of 2)

POTENTIAL IMPACT OF RAISED RURAL LEVEES ON FLOODING BEHAVIOUR
1% AEP NAMOI RIVER FLOOD

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER

NAMOI

BILLABONG

QUINNS

CHANNEL

O'BRIENS

BUNDOCK

CREEK

LAGOON

WEE WAA

GULLY

WEE WAA SHOWGROUND

COOK OVAL

WEE WAA HIGH SCHOOL

WEE WAA PUBLIC SCHOOL

NAMOI VALLEY CHRISTIAN SCHOOL

ST JOSEPH'S PRIMARY SCHOOL

WEE WAA DISTRICT HEALTH SERVICE

NAMOI COTTON CO-OP

NARRABRI WEST WALGETT RAILWAY

KAMILAROI HIGHWAY

BOUNDARY STREET

MITCHELL STREET

ALMA STREET

ROSE STREET

COWPER STREET

BOOLCARROL ROAD

TRUCKING YARDS LANE

GUNNEDAH ROAD

MYALL LANE

JAMES HIBBENS AVENUE

CORMIE AVENUE

MAITLAND STREET

RIVER STREET

NELSON STREET

CHURCH STREET

GEORGE STREET

ALBION STREET

LOUIS STREET

CHRISTY STREET

WARRIOR STREET

CHARLES STREET

KILKENNY COURT

FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14

P_01 P_02 P_03 P_04 P_05 P_06

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m 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.

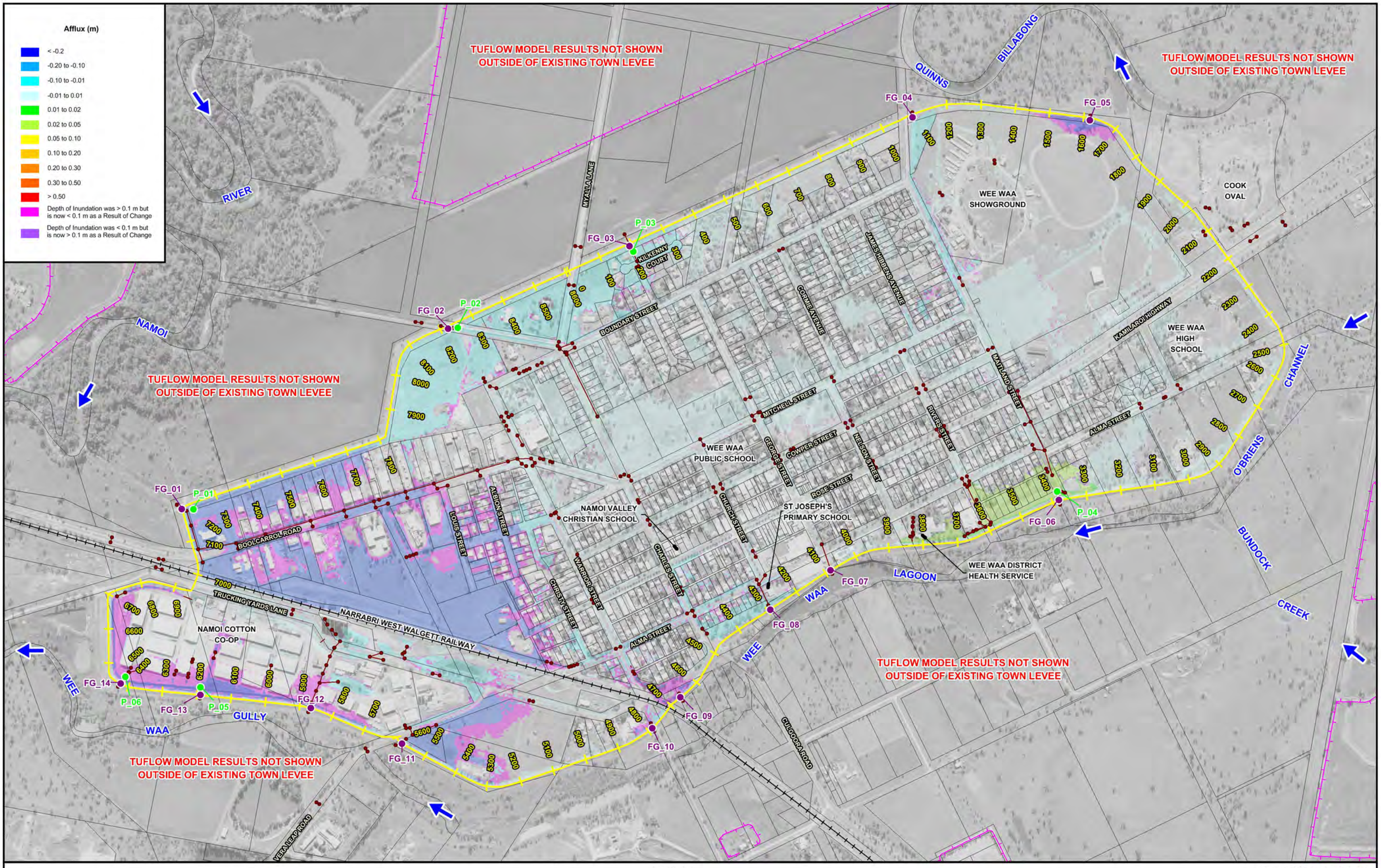
LEGEND

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.15

INDICATIVE EXTENT AND DEPTHS OF INUNDATION INTERNAL TO TOWN LEVEE
PENSTOCK GATES CLOSED AND STORMWATER EVACUATION PUMPS OPERATIONAL - 1% AEP



N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m 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

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 — Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.16

POTENTIAL IMPACT OF CLOSURE OF PENSTOCK GATES WITH STORMWATER EVACUATION PUMPS OPERATIONAL ON FLOODING BEHAVIOUR - 1% AEP

Indicative Depth of Inundation (m)

- 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 1.20
- 1.20 to 1.40
- 1.40 to 1.60
- 1.60 to 2.00
- 1.80 to 2.00
- > 2.00

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER

NAMOI

WEE WAA

GULLY

WEE WAA

CHANNEL

BUNDOCK CREEK

LAGOON

QUINNS

BILLABONG

O'BRIENS

MYALL LANE

BOUNDARY STREET

KILKENNY COURT

JAMES HIBBENS AVENUE

CORMIE AVENUE

KAMILAROI HIGHWAY

MAITLAND STREET

ALMA STREET

RIVER STREET

MITCHELL STREET

GEORGE STREET

COWPER STREET

NELSON STREET

ROSE STREET

CHURCH STREET

CHARLES STREET

WARRIOR STREET

CHRISTY STREET

ALBION STREET

LOUIS STREET

BOOLCARROL ROAD

TRUCKING YARDS LANE

NARRABRI WEST WALGETT RAILWAY

GILGOOGA ROAD

VERALEAP ROAD

WEE WAA SHOWGROUND

COOK OVAL

WEE WAA HIGH SCHOOL

WEE WAA PUBLIC SCHOOL

NAMOI VALLEY CHRISTIAN SCHOOL

ST JOSEPH'S PRIMARY SCHOOL

WEE WAA DISTRICT HEALTH SERVICE

NAMOI COTTON CO-OP

FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14

P_01 P_02 P_03 P_04 P_05 P_06

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m 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.

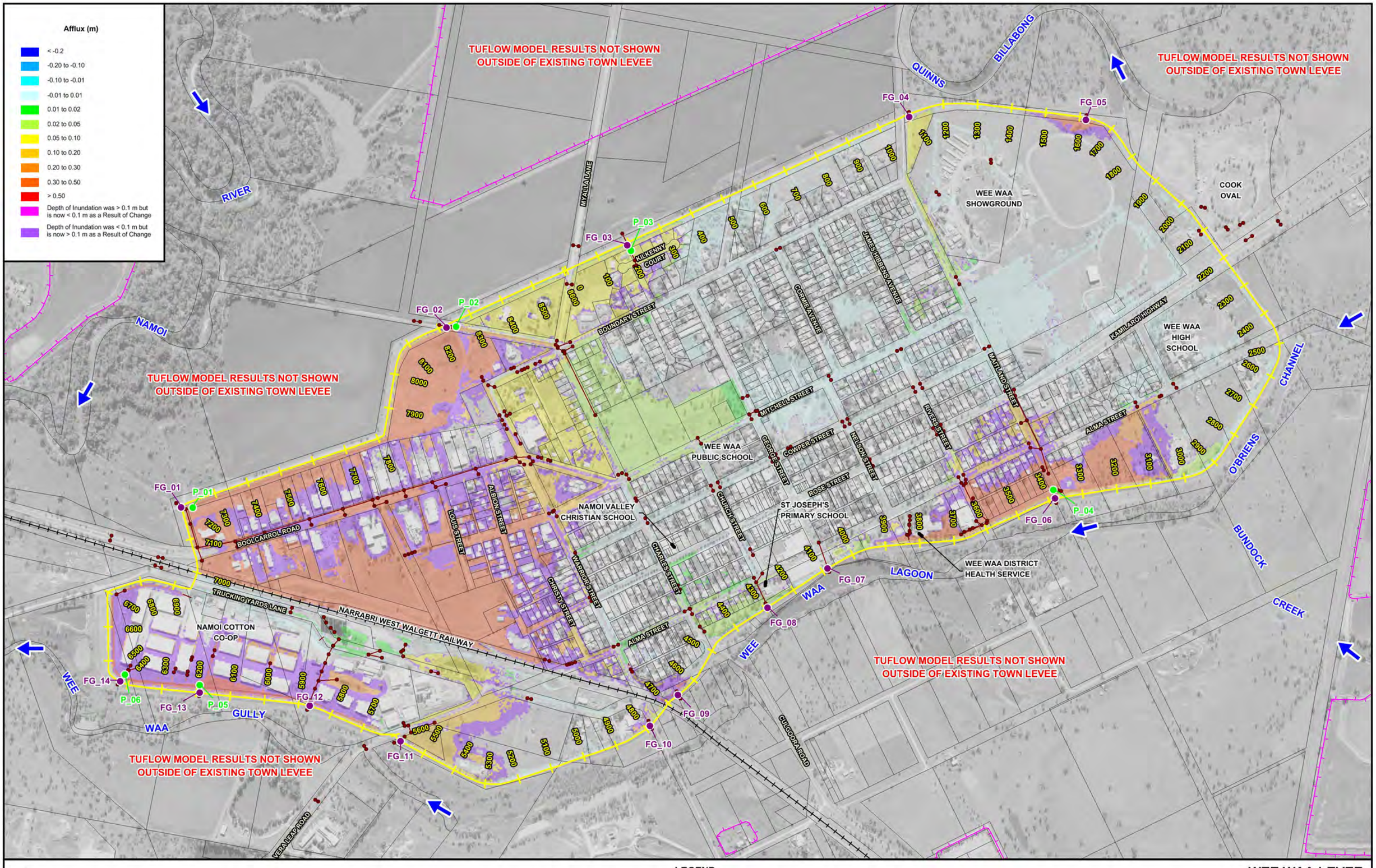
LEGEND

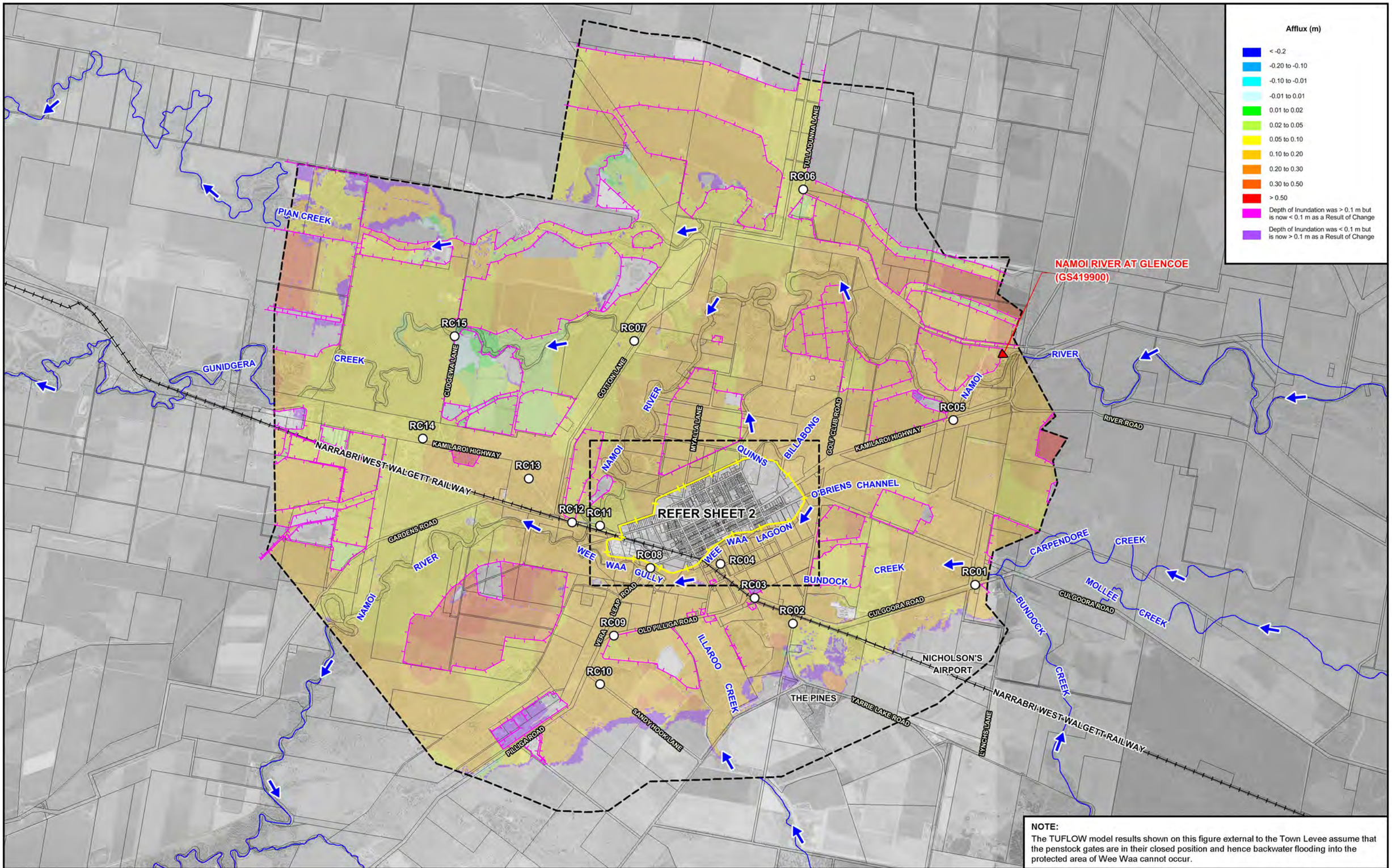
- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.17

INDICATIVE EXTENT AND DEPTHS OF INUNDATION INTERNAL TO TOWN LEVEE
PENSTOCK GATES CLOSED AND STORMWATER EVACUATION PUMPS INOPERABLE - 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
Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change
TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE
RIVER
NAMOI
QUINNS
BILLABONG
CHANNEL
O'BRIENS
BUNDOCK
CREEK
LAGOON
WAA
WEE
GULLY
MYALL LANE
BOUNDARY STREET
KILKENNY COURT
JAMES HIBBENS AVENUE
CORMIE AVENUE
KAMILAROI HIGHWAY
MAITLAND STREET
MITCHELL STREET
GEORGE STREET
COWPER STREET
NELSON STREET
RIVER STREET
ALMA STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
CHILGOORA ROAD
VERALEE ROAD
WEE WAA SHOWGROUND
COOK OVAL
WEE WAA HIGH SCHOOL
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
NAMOI COTTON CO-OP
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06
N
100 0 100 200 300 m
Scale: 1:10,000
Lyall & Associates
Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m 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
Modelled Stormwater Network
Existing Rural Levees on Namoi River Floodplain
Existing Town Levee Centre Line and Chainage
Flood Gate Location and Identifier
Pump Location and Identifier
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN
Figure 2.18
POTENTIAL IMPACT OF CLOSURE OF PENSTOCK GATES WITH STORMWATER EVACUATION PUMPS INOPERABLE ON FLOODING BEHAVIOUR - 1% AEP



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.19
(Sheet 1 of 2)

SENSITIVITY OF FLOOD BEHAVIOUR TO 20% INCREASE IN HYDRAULIC ROUGHNESS VALUES
1% AEP NAMOI RIVER FLOOD

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

RIVER
NAMOI
QUINNS
BILLABONG
MYALL LANE
BOUNDARY STREET
KILKENNY COURT
JAMES HIBBENS AVENUE
CORMIE AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
MITCHELL STREET
RIVERS STREET
ALMA STREET
CHANNEL
O'BRIENS
BUNDOCK
CREEK
LAGOON
WAA
WEE
WEE WAA PUBLIC SCHOOL
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
ALBION STREET
LOUIS STREET
WARRIOR STREET
CHRISTY STREET
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
GULLY
CUTTOOBARROAD
VERALEAP ROAD
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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

- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.19
(Sheet 2 of 2)

SENSITIVITY OF FLOOD BEHAVIOUR TO 20% INCREASE IN HYDRAULIC ROUGHNESS VALUES
1% AEP NAMOI RIVER FLOOD

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

NAMOI RIVER AT GLENCOE (GS419900)

RC06 RC15 RC07 RC14 RC05 RC13 RC12 RC11 RC08 RC04 RC03 RC02 RC01 RC09 RC10

REFER SHEET 2

PIAN CREEK
GUNIDGERA CREEK
NAMOI RIVER
RIVER
TULLADUNNA LANE
CUDGEWA LANE
COTTON LANE
KAMILAROI HIGHWAY
NARRABRI WEST-WALGETT RAILWAY
GOLF CLUB ROAD
BILLABONG
QUINNS
O'BRIENS CHANNEL
WEE WAA LAGOON
WEE WAA GULLY
GARDENS ROAD
LEAP ROAD
OLD PILLIGA ROAD
VERA
ILLAROO CREEK
SANDY HOOK LANE
PILLIGA ROAD
BUNDOCK CREEK
CULGOORA ROAD
CARPENDORE CREEK
MOLLEE CREEK
NICHOLSON'S AIRPORT
THE PINES
YARRIE LAKE ROAD
LYNCHS LANE
RIVER ROAD

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.20
(Sheet 1 of 2)

SENSITIVITY OF FLOOD BEHAVIOUR TO PARTIAL BLOCKAGE OF MAJOR HYDRAULIC STRUCTURES - 1% AEP NAMOI RIVER FLOOD

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

RIVER
NAMOI
QUINNS
BILLABONG
MYALLA LANE
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06
KILKENNY COURT
BOUNDARY STREET
CORMIE AVENUE
JAMES HIBBENS AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
MITCHELL STREET
RIVERS STREET
ALMA STREET
CHANNEL
O'BRIENS
WEE WAA PUBLIC SCHOOL
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
ALBION STREET
LOUIS STREET
WARRIOR STREET
CHRISTY STREET
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
WEE WAA GULLY
WEE WAA LAGOON
BUNDOCK CREEK
GILGOOBAR ROAD
VERALEE ROAD

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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

- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage (1000 1100)
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.20
(Sheet 2 of 2)

SENSITIVITY OF FLOOD BEHAVIOUR TO PARTIAL BLOCKAGE OF MAJOR HYDRAULIC STRUCTURES - 1% AEP NAMOI RIVER FLOOD

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

NAMOI RIVER AT GLENCOE (GS419900)

RC06 RC07 RC05 RC15 RC14 RC13 RC12 RC11 RC08 RC04 RC03 RC02 RC01 RC09 RC10

REFER SHEET 2

PIAN CREEK
GUNIDGERA CREEK
CUDGEWA LANE
COTTON LANE
TULLADUNNA LANE
NAMOI RIVER
HYALLA LANE
QUINNS
BILLABONG
GOLF CLUB ROAD
KAMILAROI HIGHWAY
RIVER ROAD
O'BRIENS CHANNEL
NARRABRI WEST-WALGETT RAILWAY
GARDENS ROAD
WEE WAA LAGOON
WEE WAA GULLY
BUNDOCK CREEK
CARPENDORE CREEK
MOLLEE CREEK
CULGOORA ROAD
LEAP ROAD
OLD PILLIGA ROAD
VERA
ILLAROO CREEK
NICHOLSON'S AIRPORT
THE PINES
YARRIE LAKE ROAD
LYNCHS LANE
SANDY HOOK LANE
PILLIGA ROAD

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.21
(Sheet 1 of 2)

POTENTIAL IMPACT OF A 10% INCREASE IN RAINFALL ON FLOODING AND DRAINAGE PATTERNS
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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

RIVER
NAMOI
QUINNS
BILLABONG
MYALLA LANE
BOUNDARY STREET
KILKENNY COURT
CORMIE AVENUE
JAMES HIBBENS AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
ALMA STREET
MITCHELL STREET
RIVER STREET
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
CHANNEL
O'BRIENS
BUNDOCK
CREEK
LAGOON
WEE WAA
WEE WAA GULLY
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
CHILGOOBARA ROAD
VERALEE ROAD

FG_01 FG_02 FG_03 FG_04 FG_05 FG_06 FG_07 FG_08 FG_09 FG_10 FG_11 FG_12 FG_13 FG_14
P_01 P_02 P_03 P_04 P_05 P_06

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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.

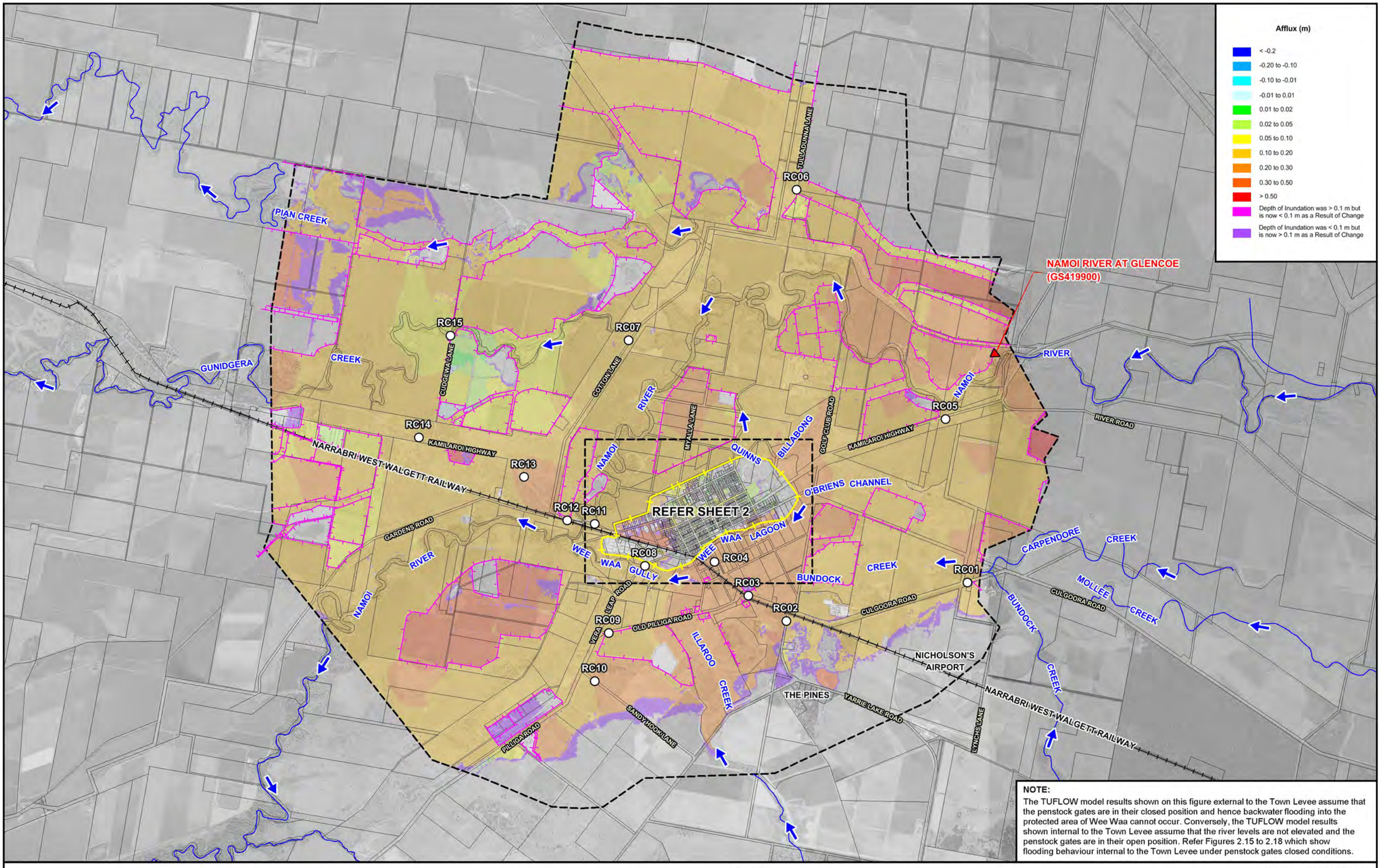
LEGEND

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.21
(Sheet 2 of 2)

POTENTIAL IMPACT OF A 10% INCREASE IN RAINFALL ON FLOODING AND DRAINAGE PATTERNS
1% AEP



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- WaterNSW Stream Gauge
- RC01 Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.22
(Sheet 1 of 2)

POTENTIAL IMPACT OF A 30% INCREASE IN RAINFALL ON FLOODING AND DRAINAGE PATTERNS
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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

RIVER
NAMOI
QUINNS
BILLABONG
MYALL LANE
FG_01
FG_02
FG_03
FG_04
FG_05
FG_06
FG_07
FG_08
FG_09
FG_10
FG_11
FG_12
FG_13
FG_14
P_01
P_02
P_03
P_04
P_05
P_06
KILKENNY COURT
BOUNDARY STREET
CORMIE AVENUE
JAMES HIBBENS AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
MAITLAND STREET
ALMA STREET
RIVER STREET
MITCHELL STREET
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
WEE WAA PUBLIC SCHOOL
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
WEE WAA DISTRICT HEALTH SERVICE
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
WEE WAA GULLY
WEE WAA LAGOON
WEE WAA CREEK
CHAINNEL
O'BRIENS
BUNDOCK
GUNNEDAH ROAD
VERALEAP ROAD

NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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.

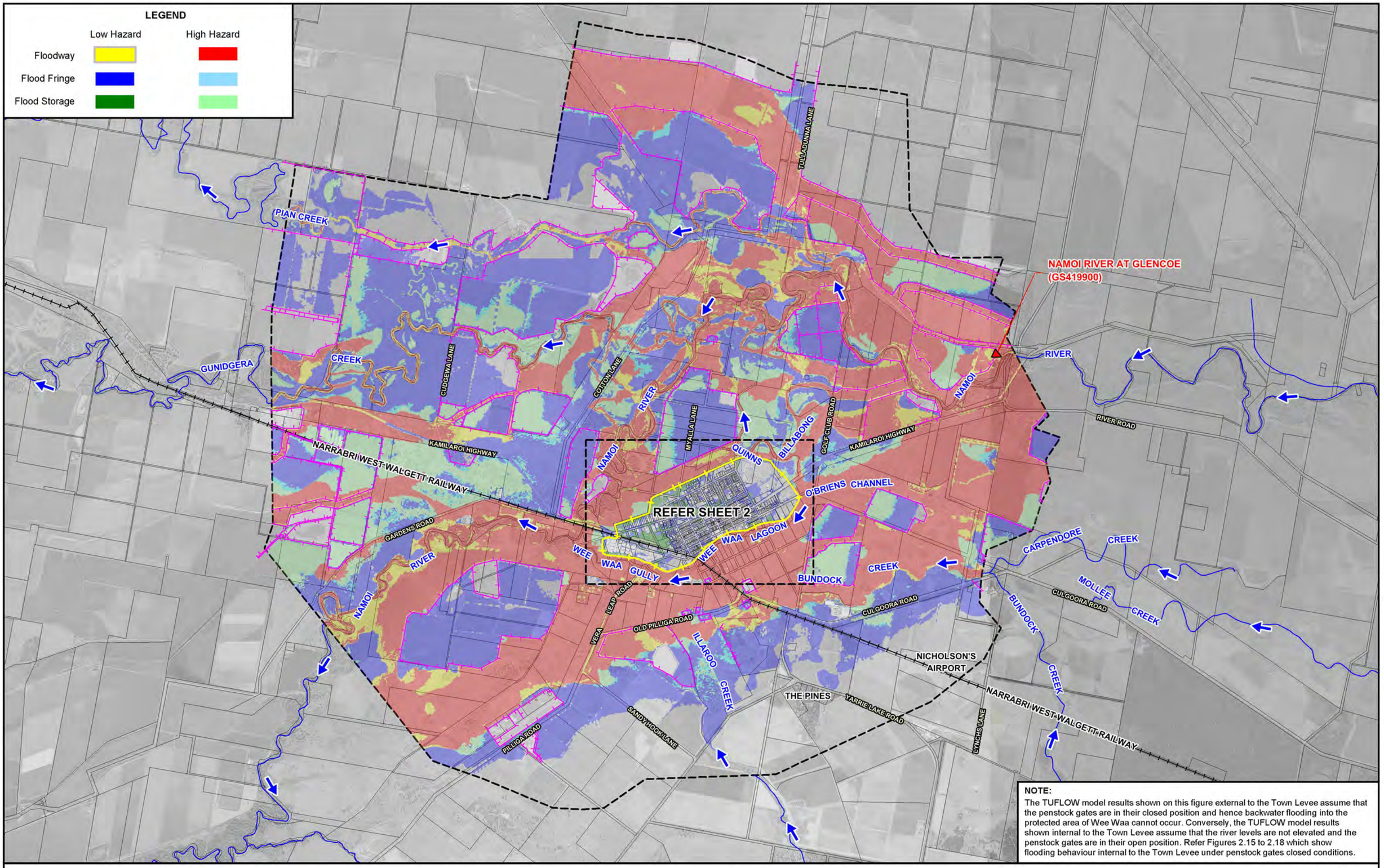
LEGEND

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.22
(Sheet 2 of 2)

POTENTIAL IMPACT OF A 30% INCREASE IN RAINFALL ON FLOODING AND DRAINAGE PATTERNS
1% AEP



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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.

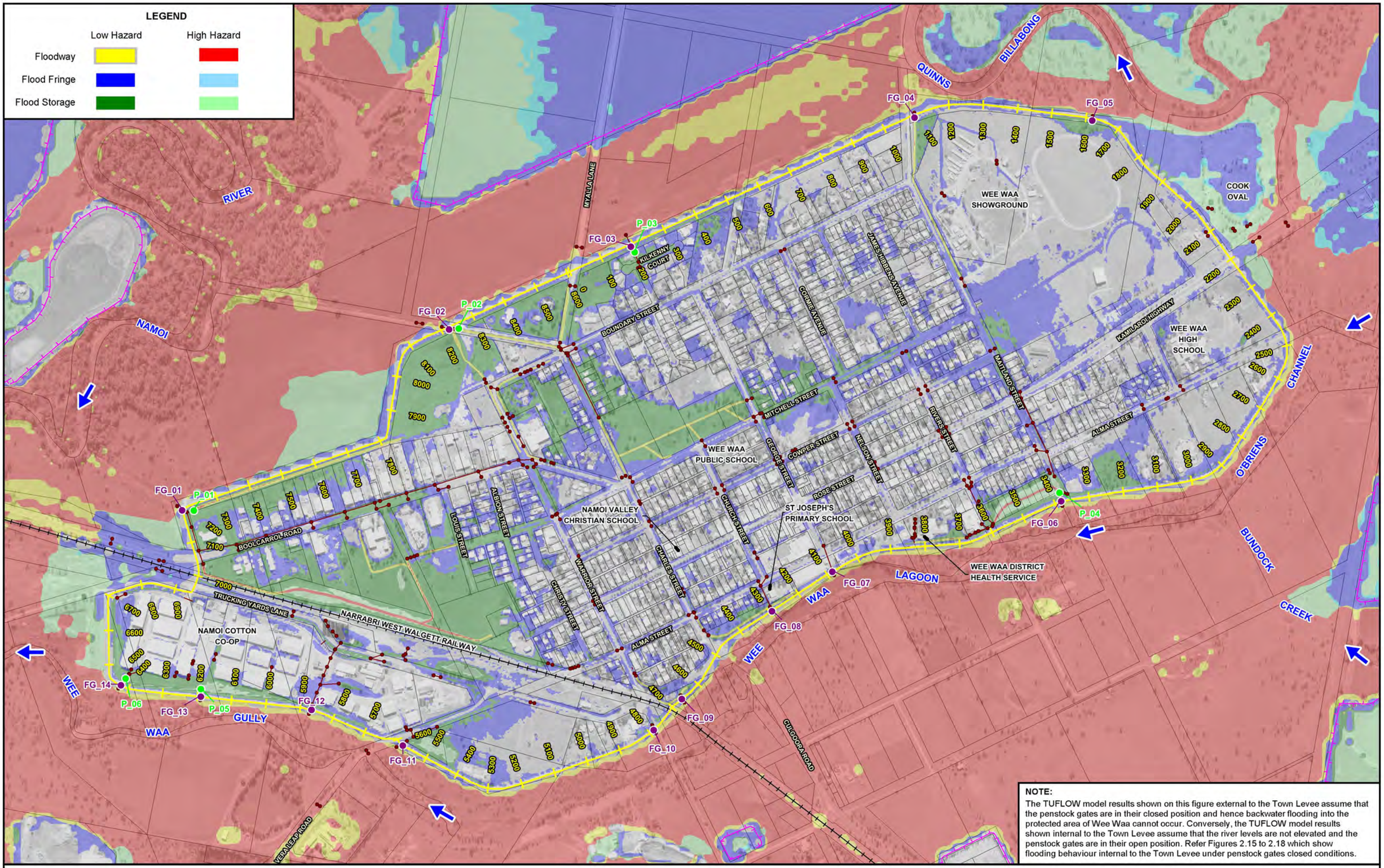
LEGEND

- Two-Dimensional Model Boundary
- WaterNSW Stream Gauge
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.23
(Sheet 1 of 2)

FLOOD HAZARD AND HYDRAULIC CATEGORISATION OF FLOODPLAIN
1% AEP



NOTE:
The TUFLOW model results shown on this figure external to the Town Levee assume that the penstock gates are in their closed position and hence backwater flooding into the protected area of Wee Waa cannot occur. Conversely, the TUFLOW model results shown internal to the Town Levee assume that the river levels are not elevated and the penstock gates are in their open position. Refer Figures 2.15 to 2.18 which show flooding behaviour internal to the Town Levee under penstock gates closed conditions.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
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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

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- Existing Town Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.23
(Sheet 2 of 2)

FLOOD HAZARD AND HYDRAULIC CATEGORISATION OF FLOODPLAIN
1% AEP

ZONE

B2	Local Centre
B4	Mixed Use
IN1	General Industrial
IN2	Light Industrial
R1	General Residential
RE1	Public Recreation
RU1	Primary Production
SP2	Infrastructure
R5	Large Lot Residential

N

200 0 200 400 600 m

Scale: 1:20,000

LEGEND

Existing Stormwater Network

1000 1500 Existing Levee Centre Line and Chainage

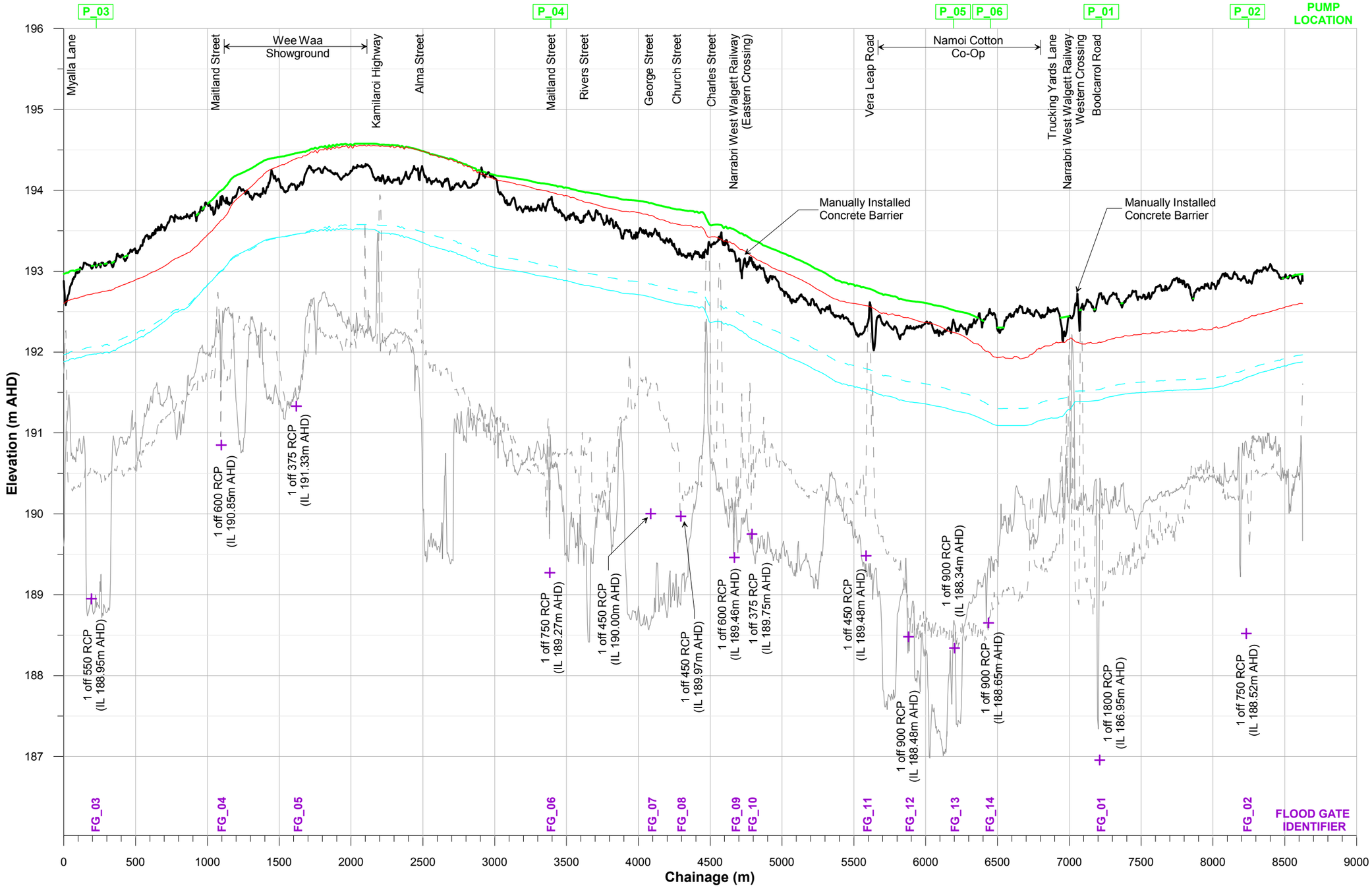
Lyall & Associates

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 2.24

NARRABRI LEP 2012 ZONING


RIVER
NAMOI
QUINNS
BILLABONG
MYALL LANE
FG_04
FG_05
P_03
FG_03
KILKENNY COURT
BOUNDARY STREET
FG_02
P_02
JAMES HIBBENS AVENUE
CORMIE AVENUE
WEE WAA SHOWGROUND
COOK OVAL
KAMILAROI HIGHWAY
WEE WAA HIGH SCHOOL
CHANNEL
MAITLAND STREET
ALMA STREET
RIVER STREET
MITCHELL STREET
WEE WAA PUBLIC SCHOOL
GEORGE STREET
COWPER STREET
NELSON STREET
ROSE STREET
CHURCH STREET
NAMOI VALLEY CHRISTIAN SCHOOL
ST JOSEPH'S PRIMARY SCHOOL
CHARLES STREET
WARRIOR STREET
CHRISTY STREET
ALBION STREET
LOUIS STREET
FG_01
P_01
BOOLCARROL ROAD
TRUCKING YARDS LANE
NARRABRI WEST WALGETT RAILWAY
NAMOI COTTON CO-OP
FG_14
P_06
FG_13
P_05
FG_12
GULLY
WAA
WEE
FG_11
FG_10
FG_09
FG_08
FG_07
FG_06
P_04
WEE WAA DISTRICT HEALTH SERVICE
LAGOON
WAA
WEE
O'BRIENS
BUNDOCK
CREEK
CULGOORA ROAD
VERALEAP ROAD
N
100 0 100 200 300 m
Scale: 1:10,000
LEGEND
Existing Stormwater Network
Existing Rural Levees on Namoi River Floodplain
Section of Existing Levee to be Raised
Section of Existing Levee to Remain
1000 1100
Existing Town Levee Chainage
FG_01
Flood Gate Location and Identifier
P_01
Pump Location and Identifier
Lyall & Associates
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN
Figure 3.1
EXTENT OF TOWN LEVEE UPGRADE REQUIREMENTS



WATER SURFACE PROFILES

- Extreme Flood
- 1% AEP
- 1% AEP (Raised Rural Levees)

GROUND PROFILES

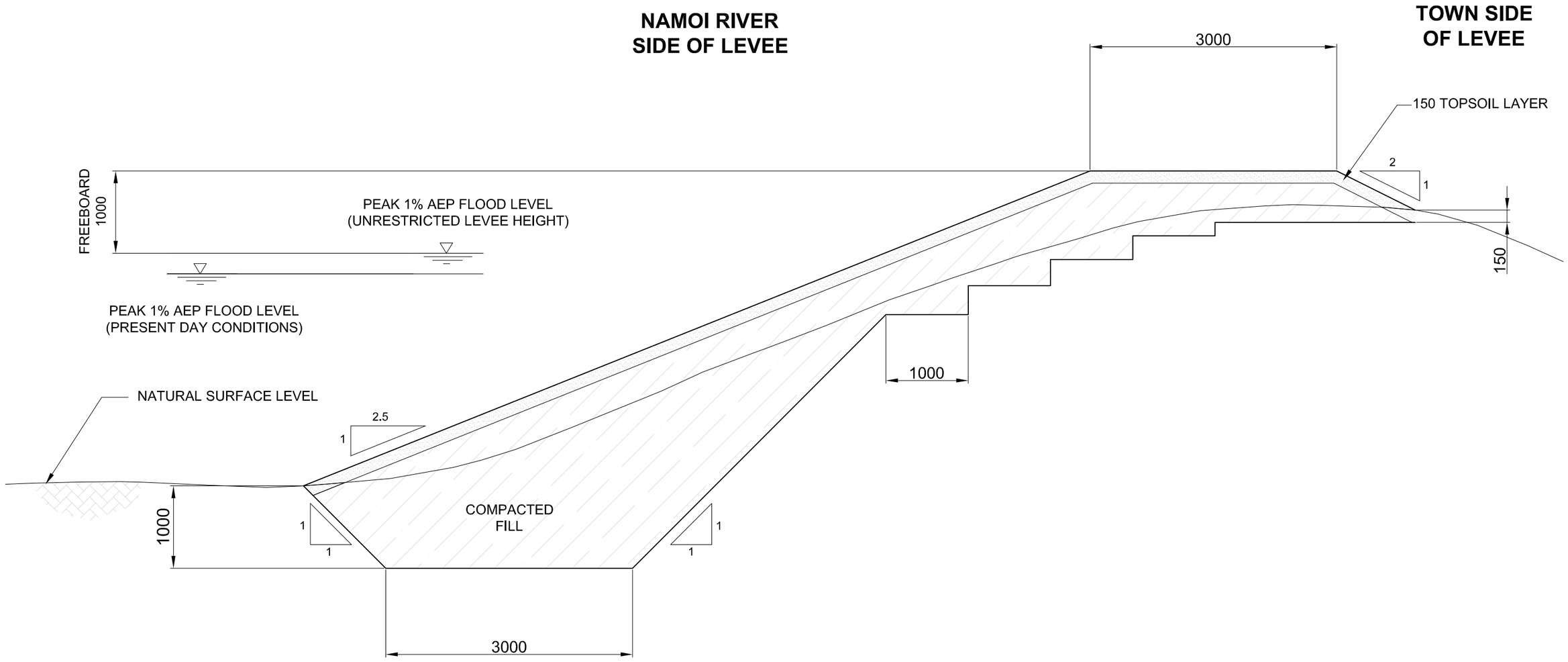
- Crest of Upgraded Town Levee
- Crest of Existing Levee
- Toe of Levee (River Side)
- Toe of Levee (Town Side)
- Invert of Pipe

Lyall & Associates

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.2

LONGITUDINAL SECTION ALONG CREST OF UPGRADED TOWN LEVEE



WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.3

TYPICAL SECTION SHOWING TOWN LEVEE UPGRADE REQUIREMENTS

Lyall & Associates

Note:
Vertical Scale: 1:50
Horizontal Scale: 1:50
All dimensions in millimetres.

60 0 60 120 180 m
Scale: 1:6,000

SDUS1 LAYOUT

3 off 750 RCP's

3 off 750 RCP's

5 off 600 RCP's

KILKENNY COURT
MYALLA LANE
GEORGE STREET
BOUNDARY STREET
CHARLES STREET
WARRIOR STREET
MITCHELL STREET
CHURCH STREET
BOOLCARROL ROAD
WEE WAA PUBLIC SCHOOL

5% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER
NAMOI
QUINNS
BILLABONG
COOK OVAL
WEE WAA SHOWGROUND
WEE WAA HIGH SCHOOL
MYALLA LANE
BOUNDARY STREET
MAITLAND STREET
MITCHELL STREET
ROSE STREET
BOOLCARROL ROAD
WARRIOR STREET
CHARLES STREET
WEE WAA LAGOON
WEE WAA GULLY

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

2% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER
NAMOI
QUINNS
BILLABONG
COOK OVAL
WEE WAA SHOWGROUND
WEE WAA HIGH SCHOOL
MYALLA LANE
BOUNDARY STREET
MAITLAND STREET
MITCHELL STREET
ROSE STREET
BOOLCARROL ROAD
WARRIOR STREET
CHARLES STREET
WEE WAA LAGOON
WEE WAA GULLY

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

1% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER
NAMOI
QUINNS
BILLABONG
COOK OVAL
WEE WAA SHOWGROUND
WEE WAA HIGH SCHOOL
MYALLA LANE
BOUNDARY STREET
MAITLAND STREET
MITCHELL STREET
ROSE STREET
BOOLCARROL ROAD
WARRIOR STREET
CHARLES STREET
WEE WAA LAGOON
WEE WAA GULLY

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

NOTE:
Flooding patterns shown assume that the river levels are not elevated and the penstock gates are in their open position.

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 5m (min) 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

- Modelled Stormwater Network
- Existing Town Levee Centre Line
- New Stormwater Network Element

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.4

IMPACT OF STORMWATER DRAINAGE UPGRADE SCHEME 1 ON LOCAL CATCHMENT FLOODING BEHAVIOUR

60 0 60 120 180 m
Scale: 1:6,000

SDUS2 LAYOUT

3 off 750 RCP's
3 off 750 RCP's
3 off 750 RCP's

KILKENNY COURT
MYALLA LANE
GEORGE STREET
BOUNDARY STREET
CHARLES STREET
WARRIOR STREET
BOOLCARROL ROAD
MITCHELL STREET
CHURCH STREET
WEE WAA PUBLIC SCHOOL

5% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER
NAMOI
QUINNS
BILLABONG
COOK OVAL
WEE WAA SHOWGROUND
WEE WAA HIGH SCHOOL
MAITLAND STREET
ROSE STREET
WEE WAA GULLY
WEE WAA LAGOON

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

2% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

1% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

NOTE:
Flooding patterns shown assume that the river levels are not elevated and the penstock gates are in their open position.

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 5m (min) 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

- Modelled Stormwater Network
- Existing Town Levee Centre Line
- New Stormwater Network Element
- Lowered Stormwater Channel Element

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.5

IMPACT OF STORMWATER DRAINAGE UPGRADE SCHEME 2 ON LOCAL CATCHMENT FLOODING BEHAVIOUR

60 0 60 120 180 m
Scale: 1:6,000

SDUS3 LAYOUT

3 off 750 RCP's
3 off 750 RCP's
3 off 750 RCP's

KILKENNY COURT
MYALLA LANE
GEORGE STREET
BOUNDARY STREET
CHARLES STREET
WARRIOR STREET
MITCHELL STREET
CHURCH STREET
BOOLCARROL ROAD
WEE WAA PUBLIC SCHOOL

5% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

RIVER
NAMOI
QUINNS
BILLABONG
COOK OVAL
WEE WAA SHOWGROUND
WEE WAA HIGH SCHOOL
MAITLAND STREET
ROSE STREET
WEE WAA LAGOON
WEE WAA GULLY

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

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
- Depth of Inundation was > 0.1 m but is now < 0.1 m as a Result of Change
- Depth of Inundation was < 0.1 m but is now > 0.1 m as a Result of Change

2% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

1% AEP

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

TUFLOW MODEL RESULTS NOT SHOWN OUTSIDE OF EXISTING TOWN LEVEE

NOTE:
Flooding patterns shown assume that the river levels are not elevated and the penstock gates are in their open position.

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 5m (min) grid and does not necessarily incorporate localised features which can influence flooding behaviour in individual allotments.

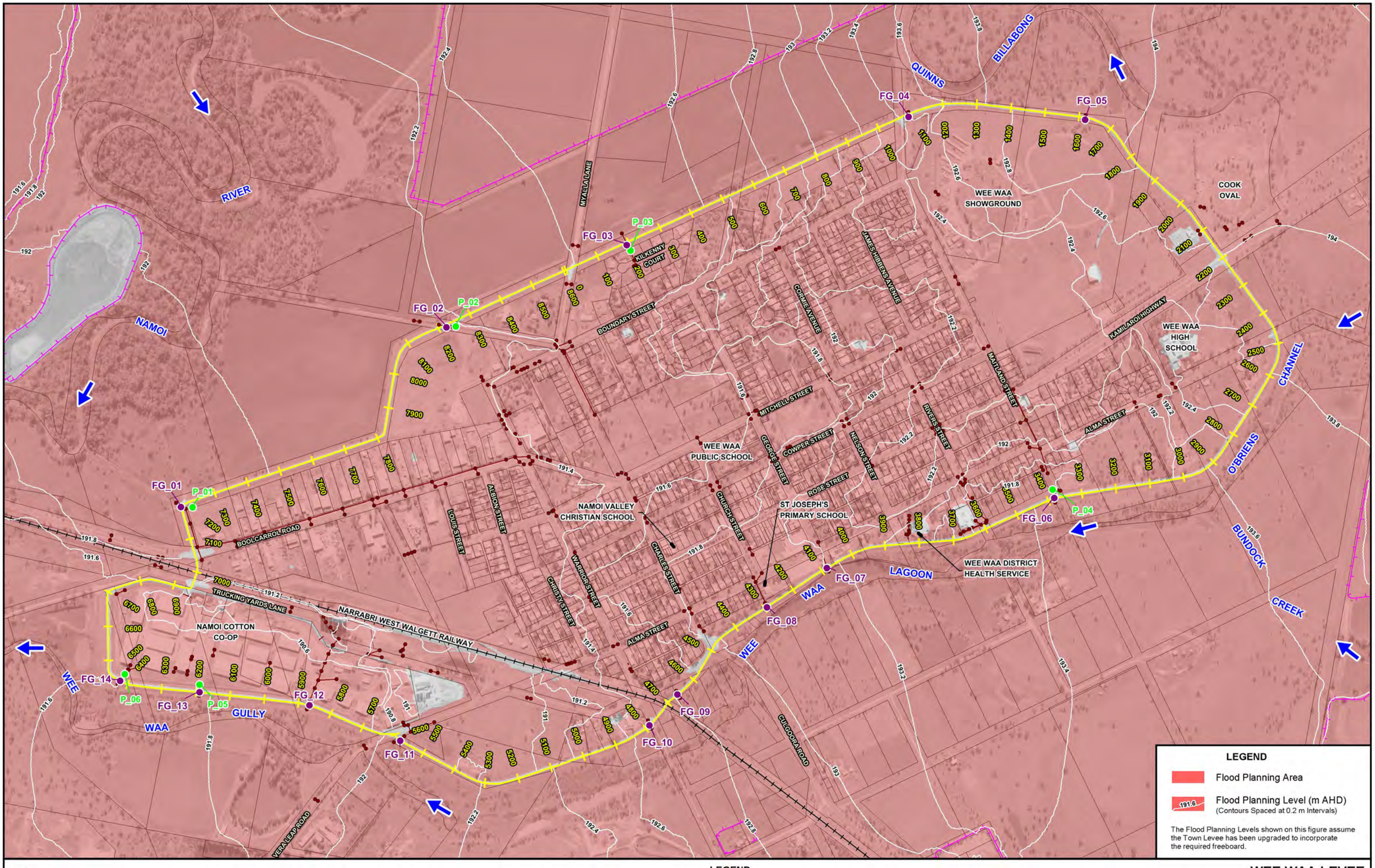
Flood depths are therefore approximate only and require interpretation by a suitably qualified engineer to determine flooding behaviour in individual allotments. Any assessment of flooding in individual allotments may also require a site survey.

LEGEND
- Modelled Stormwater Network
- Existing Town Levee Centre Line
- New Stormwater Network Element
- Lowered Stormwater Channel Element
- Extent of New Excavation

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.6

IMPACT OF STORMWATER DRAINAGE UPGRADE SCHEME 3 ON LOCAL CATCHMENT FLOODING BEHAVIOUR



LEGEND

Flood Planning Area

Flood Planning Level (m AHD)
(Contours Spaced at 0.2 m Intervals)

The Flood Planning Levels shown on this figure assume the Town Levee has been upgraded to incorporate the required freeboard.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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

Modelled Stormwater Network

Existing Rural Levees on Namoi River Floodplain

Existing Town Levee Centre Line and Chainage

FG_01 Flood Gate Location and Identifier

P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.7
(Sheet 1 of 2)

EXTRACT OF FLOOD PLANNING MAP AT WEE WAA
POST-LEVEE UPGRADE CONDITIONS

OLD PILLIGA ROAD

CULGOORA ROAD

NARRABRI WEST WALGETT RAILWAY

YARRIE LAKE ROAD

YARRIE LAKE ROAD

192.2 192.4 192.6 192.8 193 193.2 193.4 193.6 193.8 194 194.2 194.4

191.8 192 192.2 192.4 192.6 192.8 193 193.2 193.4 193.6 193.8 194 194.2

LEGEND

Flood Planning Area

191.6 Flood Planning Level (m AHD)
(Contours Spaced at 0.2 m Intervals)

The Flood Planning Levels shown on this figure assume the Town Levee has been upgraded to incorporate the required freeboard.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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

Modelled Stormwater Network

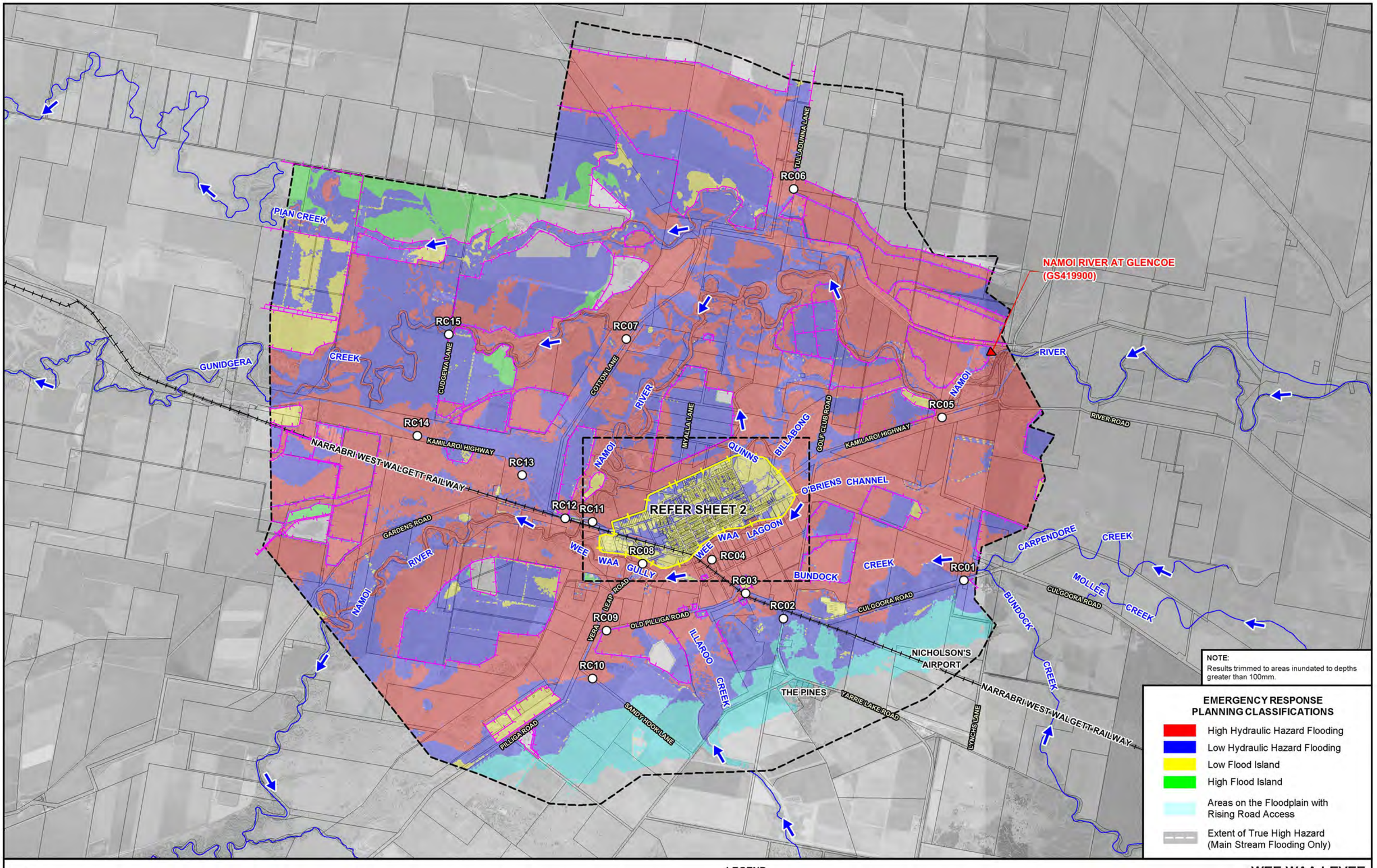
Existing Rural Levees on Namoi River Floodplain

Land Zoned R5 - Large Lot Residential

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.7
(Sheet 2 of 2)

EXTRACT OF FLOOD PLANNING MAP AT WEE WAA POST-LEVEE UPGRADE CONDITIONS



NOTE:
Results trimmed to areas inundated to depths greater than 100mm.

EMERGENCY RESPONSE PLANNING CLASSIFICATIONS

- High Hydraulic Hazard Flooding
- Low Hydraulic Hazard Flooding
- Low Flood Island
- High Flood Island
- Areas on the Floodplain with Rising Road Access
- Extent of True High Hazard (Main Stream Flooding Only)

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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.

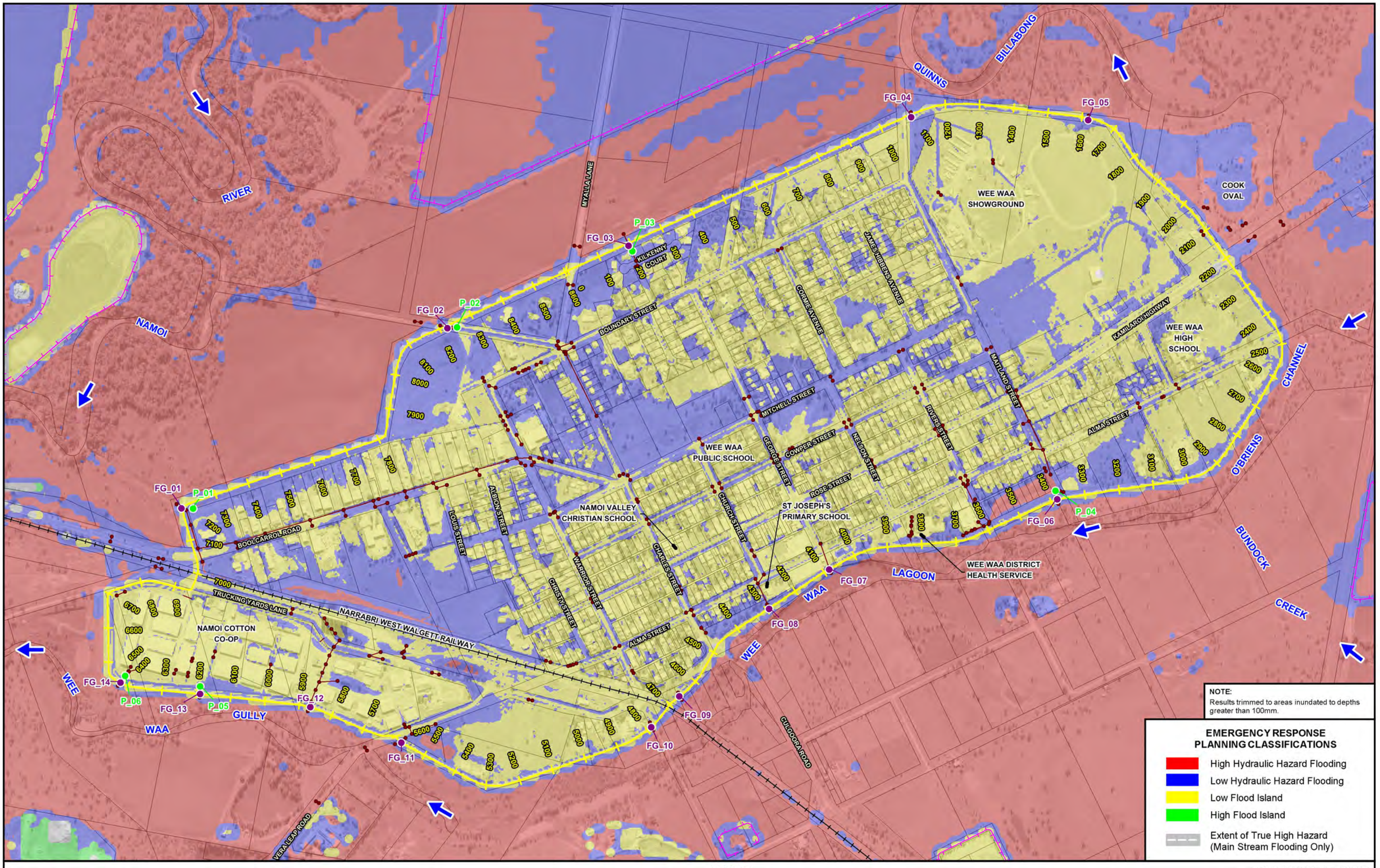
LEGEND

- Two-Dimensional Model Boundary
- WaterNSW Stream Gauge RC01
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE RISK MANAGEMENT STUDY AND PLAN

Figure 3.8
(Sheet 1 of 2)

FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATIONS
1% AEP



NOTE:
Results trimmed to areas inundated to depths greater than 100mm.

EMERGENCY RESPONSE PLANNING CLASSIFICATIONS

- High Hydraulic Hazard Flooding
- Low Hydraulic Hazard Flooding
- Low Flood Island
- High Flood Island
- Extent of True High Hazard (Main Stream Flooding Only)

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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.

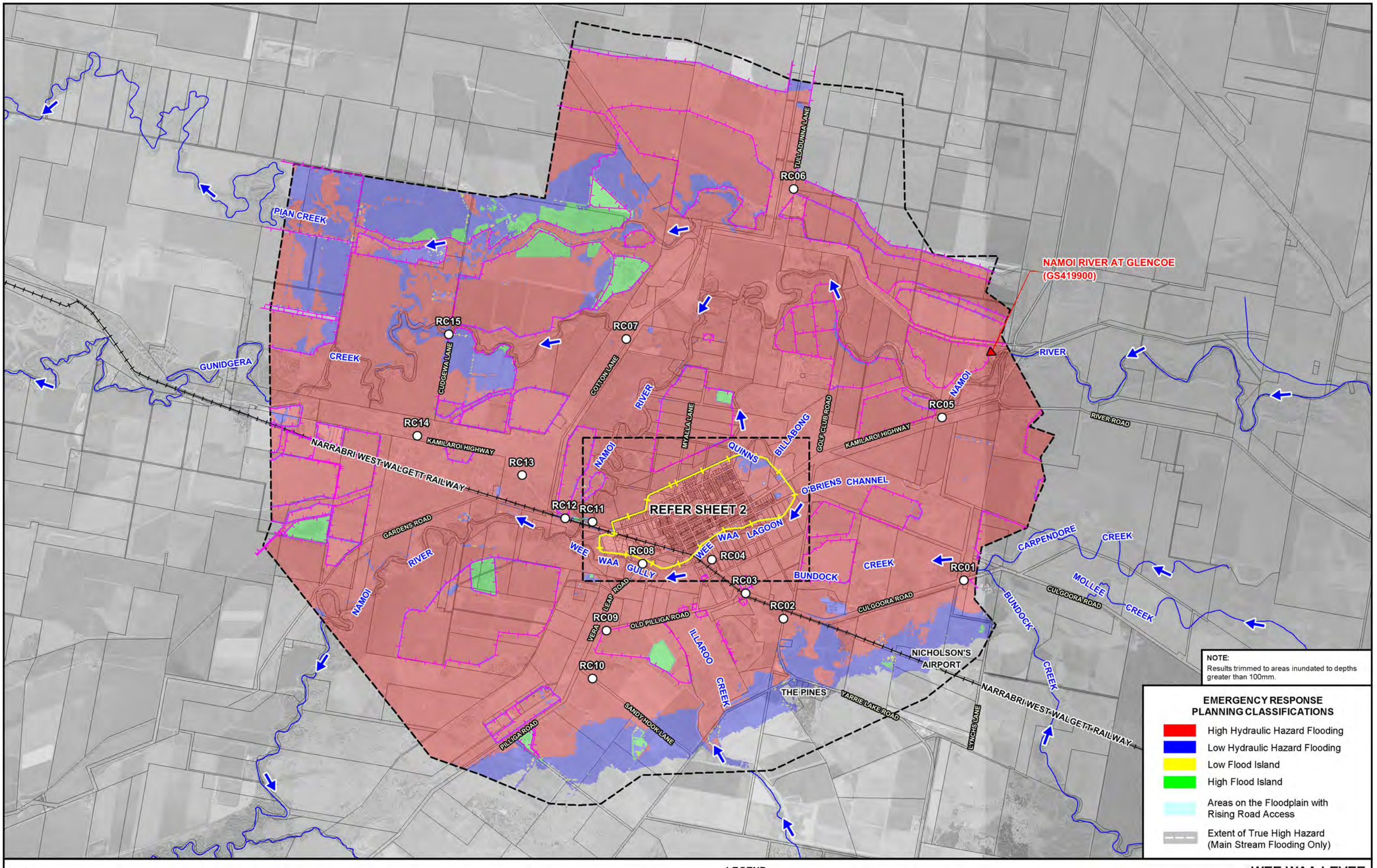
LEGEND

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 4000 4100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.8
(Sheet 2 of 2)

FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATIONS
1% AEP



N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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
- WaterNSW Stream Gauge (RC01)
- Low Point in Major Road and Identifier
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure 3.9
(Sheet 1 of 2)

FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATIONS
EXTREME FLOOD

NOTE:
Results trimmed to areas inundated to depths greater than 100mm.

EMERGENCY RESPONSE PLANNING CLASSIFICATIONS

- High Hydraulic Hazard Flooding
- Low Hydraulic Hazard Flooding
- Low Flood Island
- High Flood Island
- Extent of True High Hazard (Main Stream Flooding Only)

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

Note:
The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 20m 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

- Modelled Stormwater Network
- Existing Rural Levees on Namoi River Floodplain
- 1000 1100 Existing Town Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

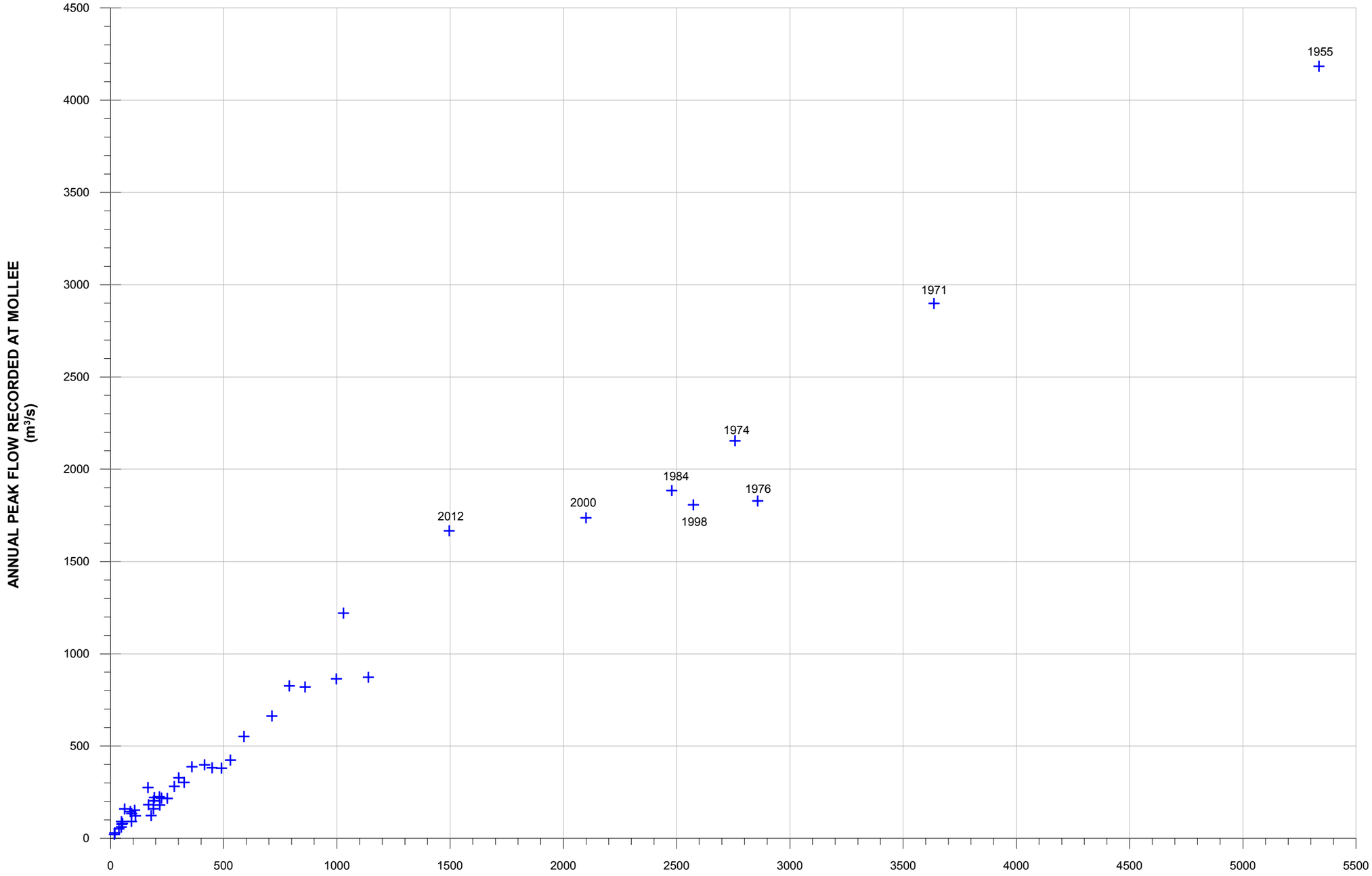
Figure 3.9
(Sheet 2 of 2)

FLOOD EMERGENCY RESPONSE PLANNING CLASSIFICATIONS
EXTREME FLOOD

APPENDIX C

FLOOD STUDY UPDATE

LIST OF FIGURES (APPENDIX C)



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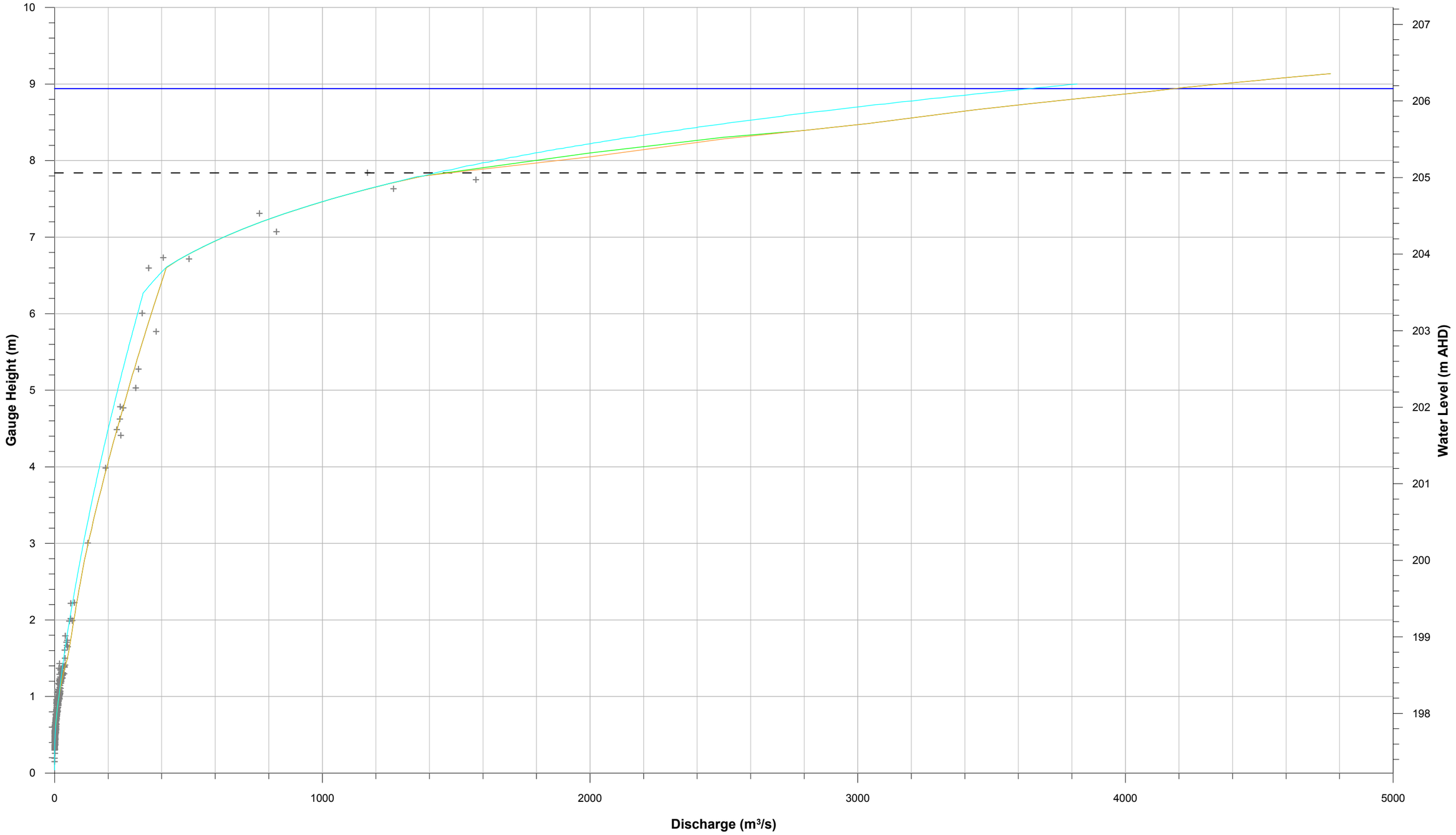
NOTE:
1. Source: WRM, 2016.

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C1.1

COMPARISON OF ANNUAL PEAK FLOWS
MOLLEE VERSUS NARRABRI STREAM GAUGES
PERIOD 1971-2015 AND 1955



LEGEND

- February 1955 Peak Height - 8.94 m (206.16 m AHD)
- Max Gauged Height - 7.84 m (205.06 m AHD)
- Gauged River Height and Discharge
- Pre-1971 DPIE Rating Curve
- Post-1971 DPIE Rating Curve
- WaterNSW No. 314.05 Rating Curve

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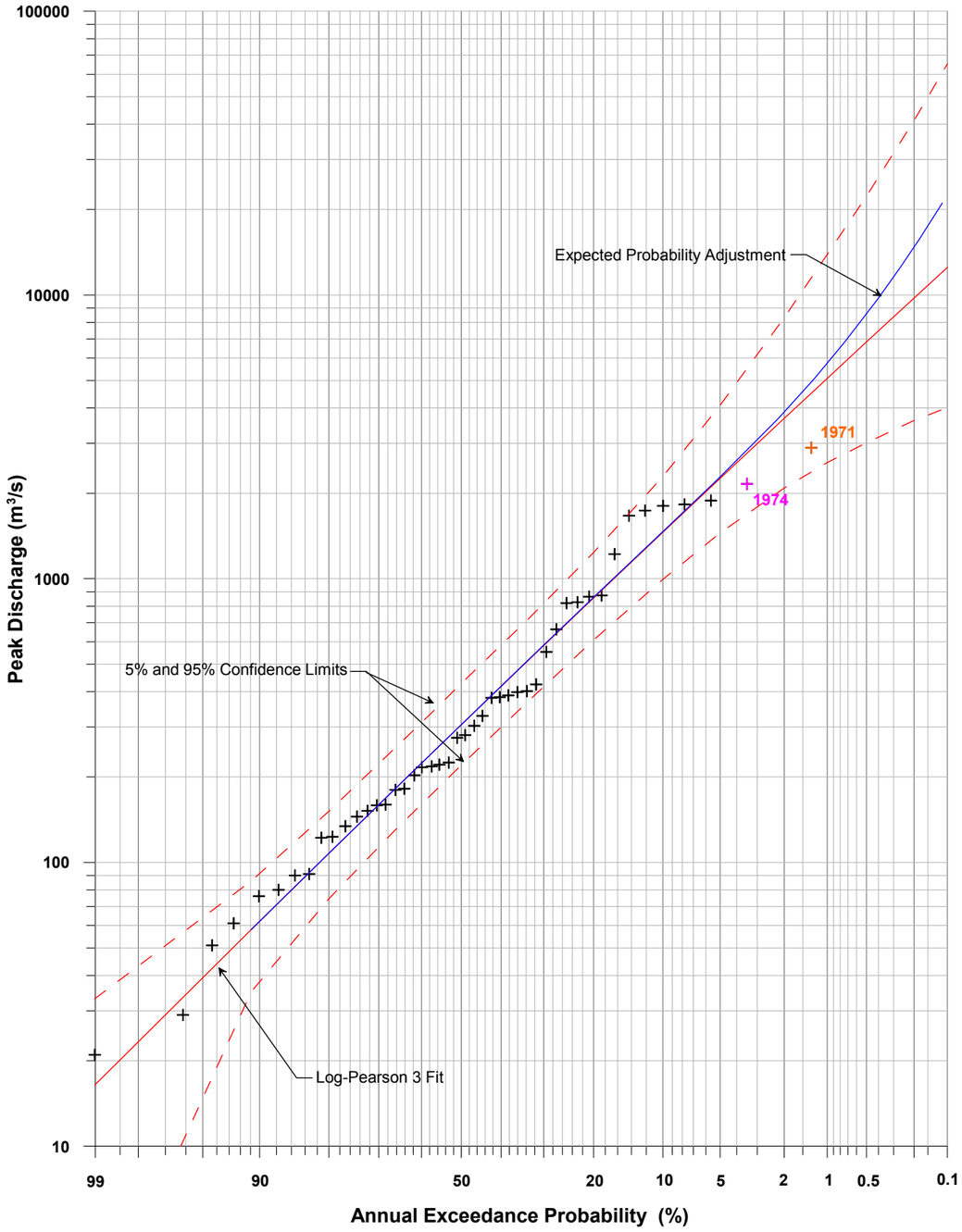
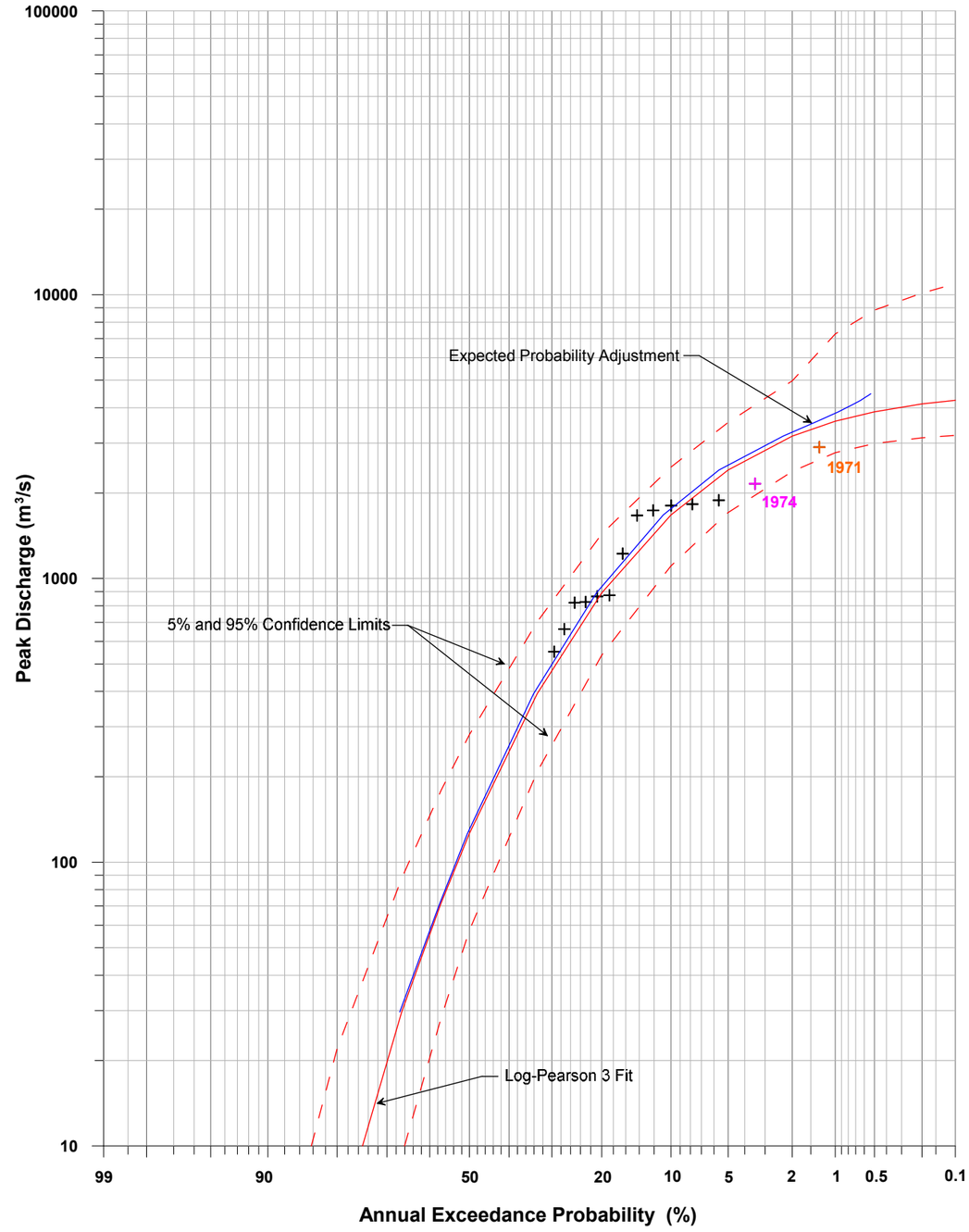
NOTE:
Gauge zero = 197.22 m AHD.

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C1.2

RATING CURVES
NAMOI RIVER AT MOLLEE STREAM GAUGE (GS 419039)





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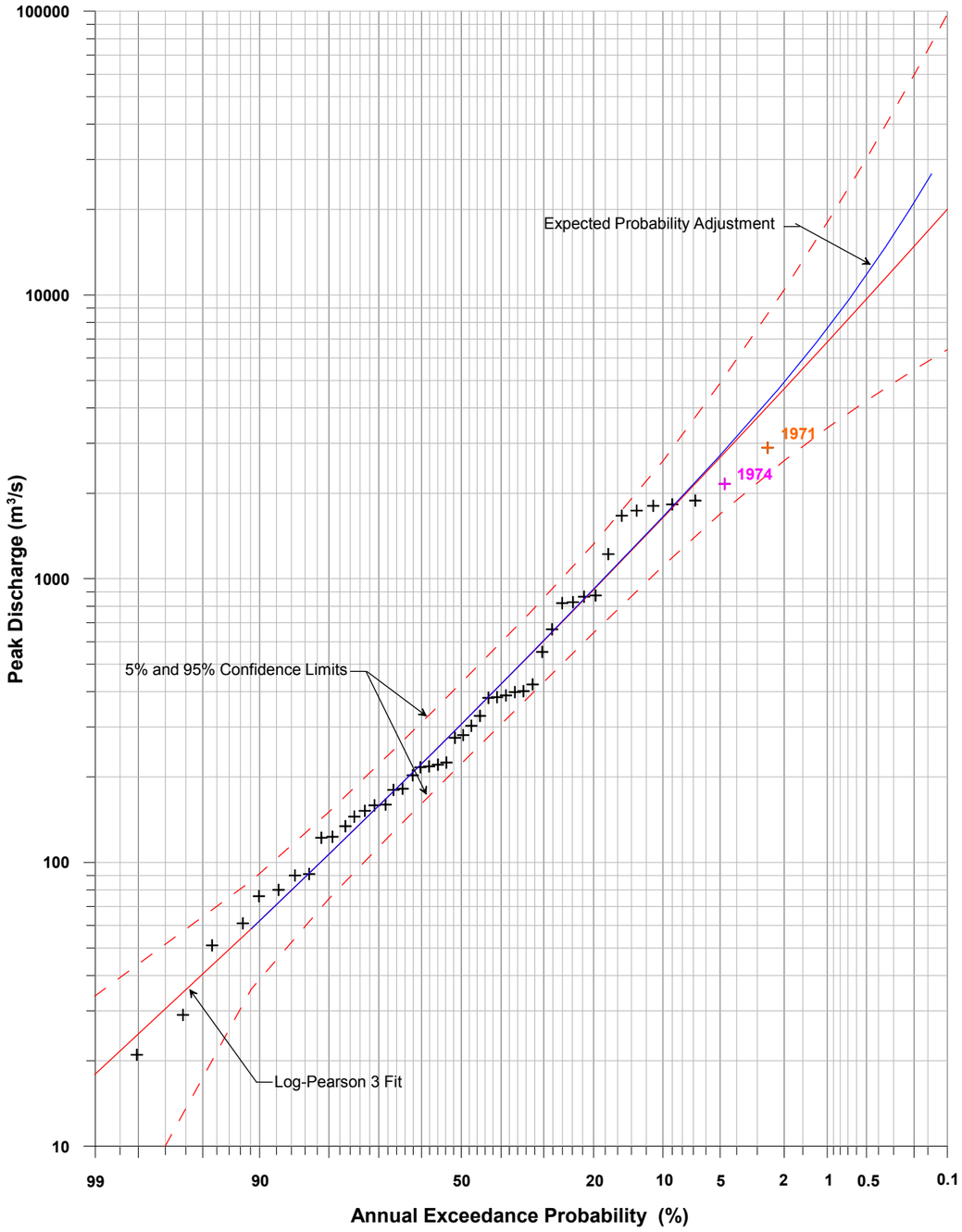
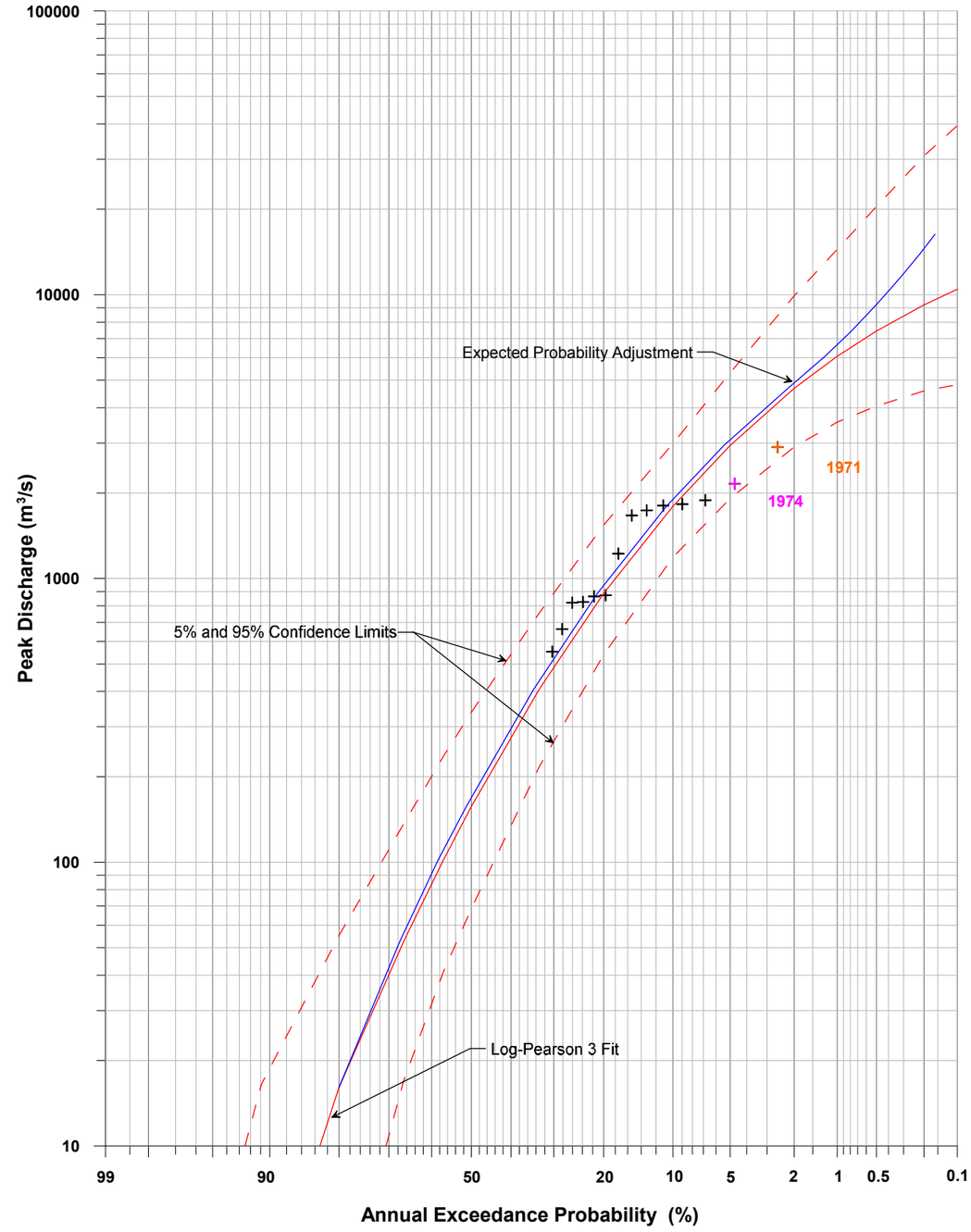
RISK MANAGEMENT STUDY AND PLAN

Figure C1.3
(Sheet 1 of 3)

FLOOD FREQUENCY RELATIONSHIP
LOG-PEARSON 3 ANNUAL SERIES 1971-2016
NAMOI RIVER AT MOLLEE STREAM GAUGE (GS 419039)





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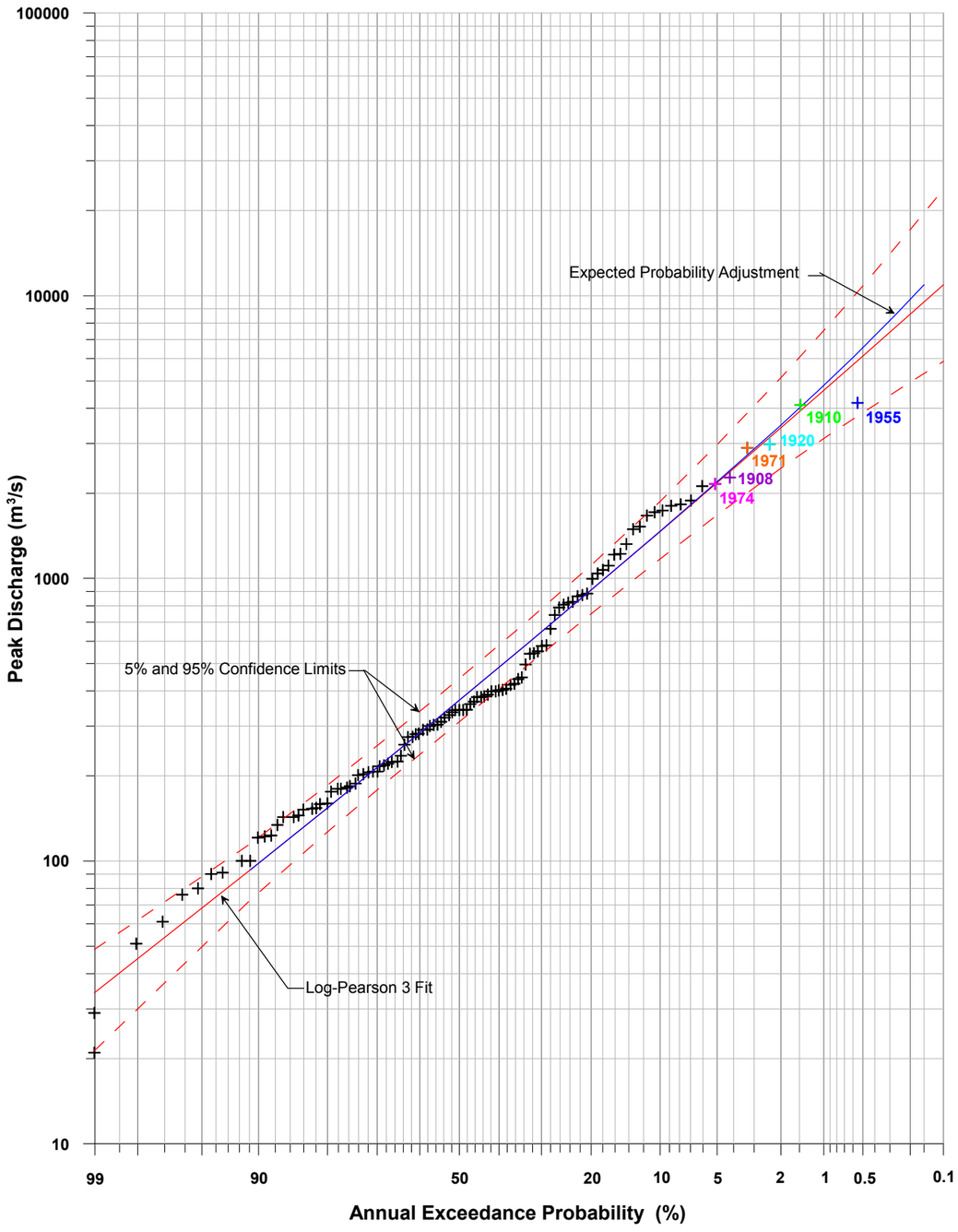
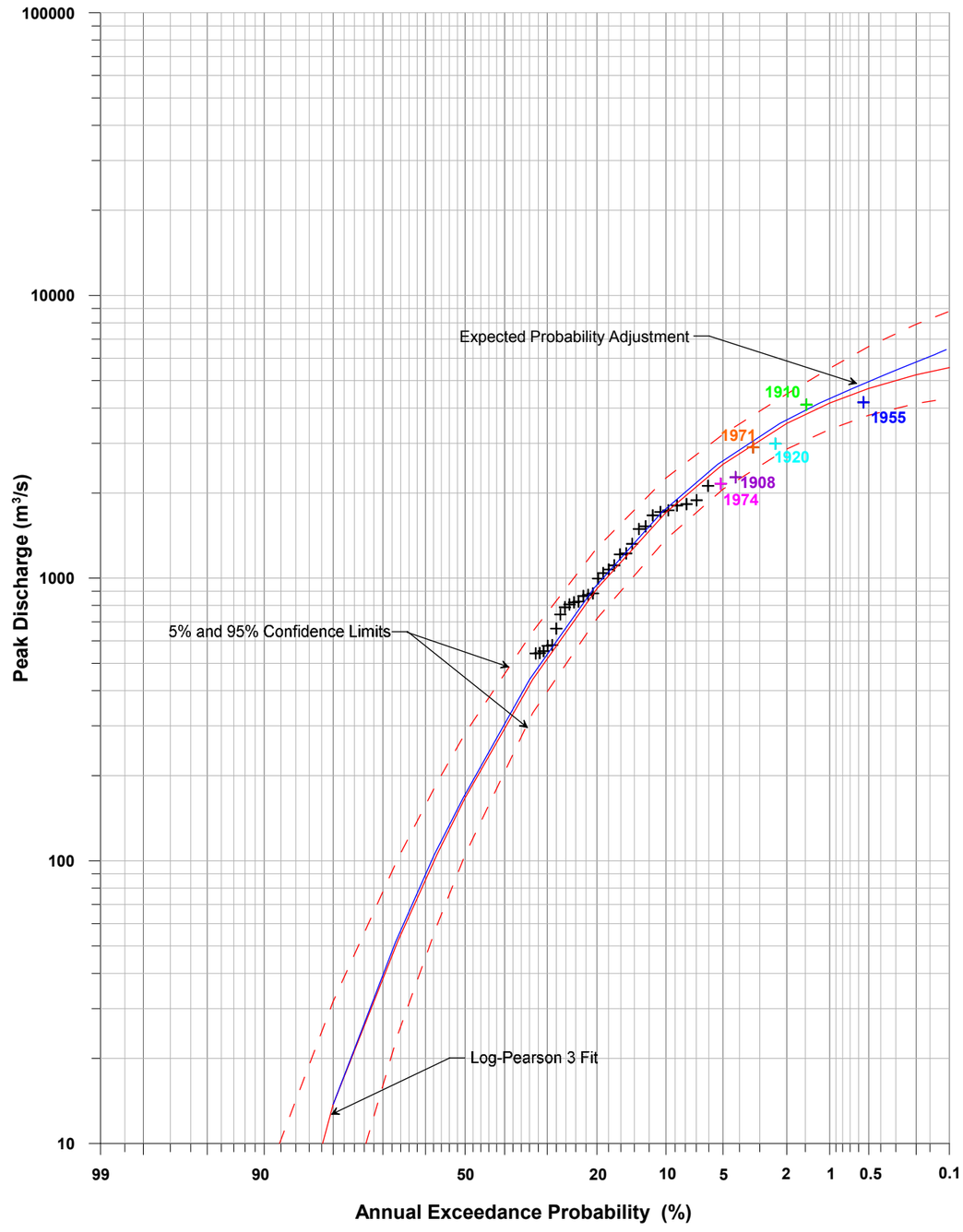
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C1.3
(Sheet 2 of 3)

FLOOD FREQUENCY RELATIONSHIP
LOG-PEARSON 3 ANNUAL SERIES 1971-2016
NAMOI RIVER AT MOLLEE STREAM GAUGE (GS 419039)





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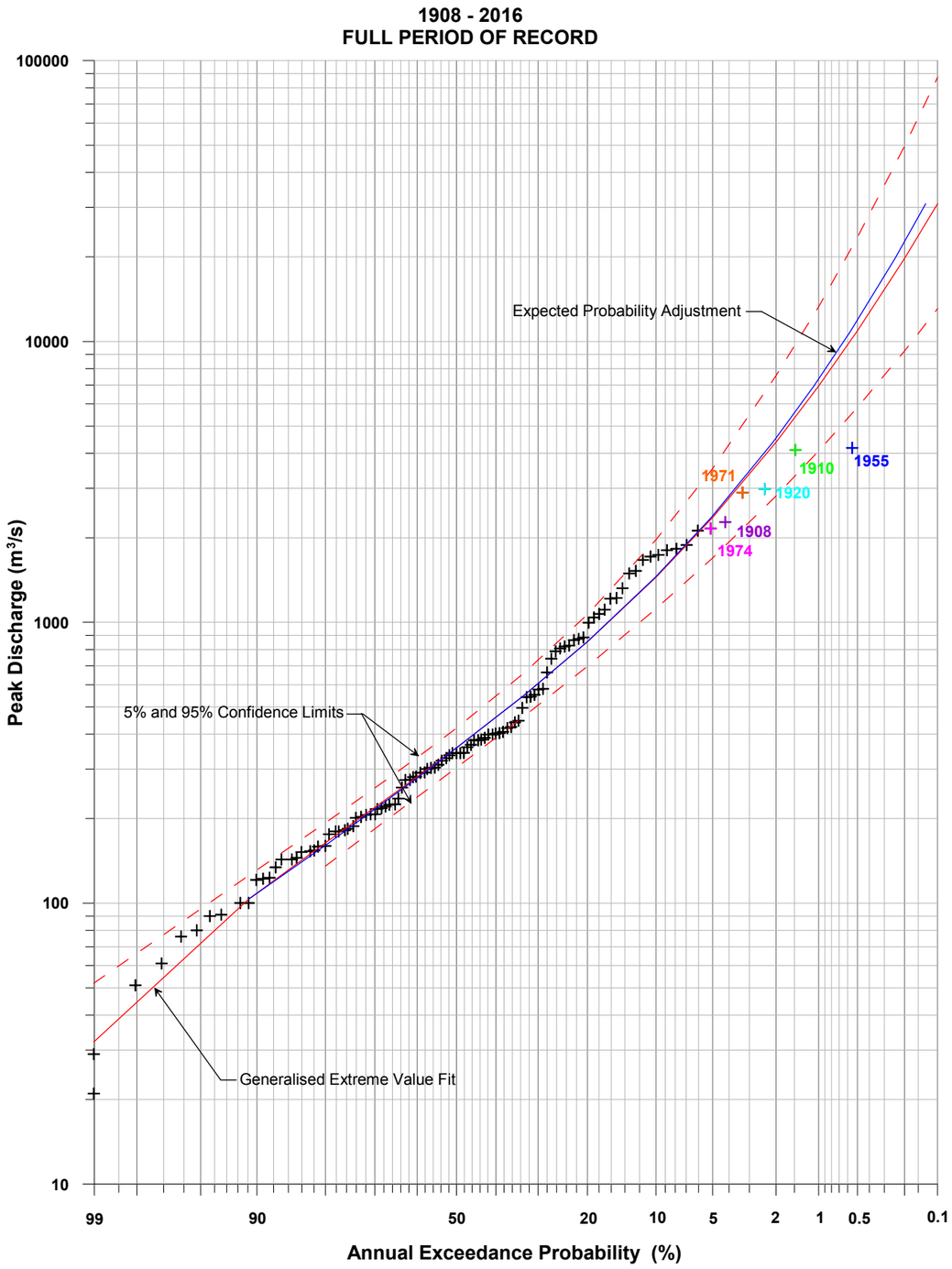
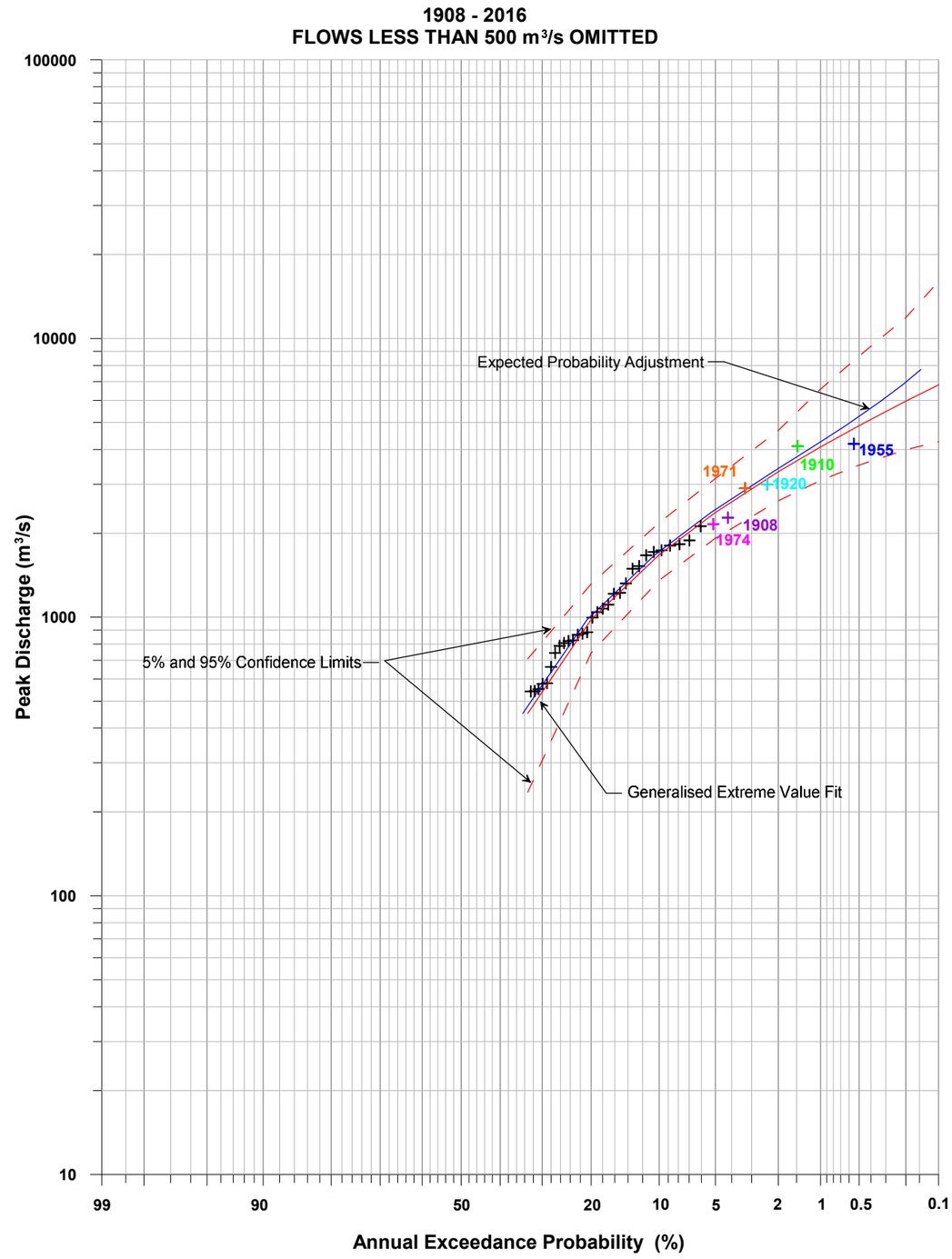
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C1.3
(Sheet 3 of 3)

FLOOD FREQUENCY RELATIONSHIP
LOG-PEARSON 3 ANNUAL SERIES 1971-2016
NAMOI RIVER AT MOLLEE STREAM GAUGE (GS 419039)





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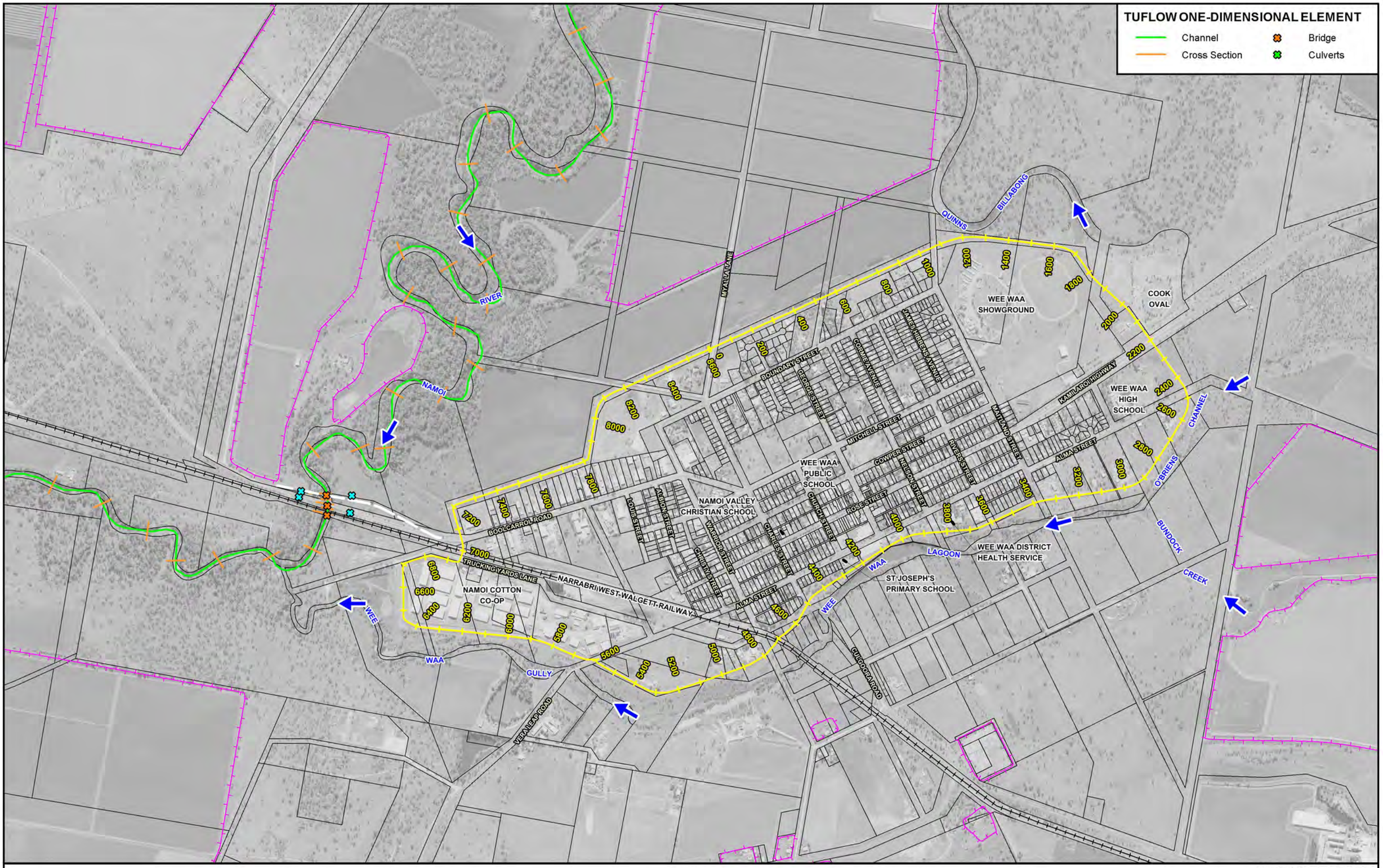
RISK MANAGEMENT STUDY AND PLAN

Figure C1.4

FLOOD FREQUENCY RELATIONSHIP
GENERALISED EXTREME VALUE ANNUAL SERIES 1971-2016
NAMOI RIVER AT MOLLEE STREAM GAUGE (GS 419039)


TUFLOW ONE-DIMENSIONAL ELEMENT
Channel
Cross Section
Bridge
Weir
Culverts
TUFLOW BOUNDARY CONDITIONS
Inflow - Point Source and Identifier
Outlet (Free Discharge)
Inflow Boundary and Identifier
Two-Dimensional Model Boundary
REFER SHEET 2
PIAN CREEK
GUNIDGERA CREEK
GUDGEWA LANE
COTTON LANE
TULLADUNNA LANE
WHITEACRES
GLENCOE
NAMOI RIVER
RIVER ROAD
NAMOI_LB
CAPENDORE_RB
CAPENDORE
CARPENDORE CREEK
MOLLEE CREEK
BUNDOCK CREEK
CULGOORA ROAD
KAMILAROI HIGHWAY
NARRABRI WEST-WALGETT RAILWAY
GARDENS ROAD
NAMOI RIVER
LYALL LANE
QUINNS
BILLABONG
GOLF CLUB ROAD
O'BRIENS CHANNEL
WEE WAA LAGOON
WEE WAA GULLY
LEAP ROAD
OLD PILLIGA ROAD
VERA
ILLAROO CREEK
NICHOLSON'S AIRPORT
THE PINES
YARRIE LAKE ROAD
LYNCHS LANE
SANDY HOOK LANE
PILLIGA ROAD
N
600 0 600 1200 1800 m
Scale: 1:60,000
LEGEND
Existing Town Levee Centre Line
Existing Rural Levees on Namoi River Floodplain
Lyall & Associates
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN
Figure C3.1
(Sheet 1 of 2)
NAMOI RIVER TUFLOW MODEL LAYOUT



N

150 0 150 300 450 m

Scale: 1:15,000

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LEGEND

Existing Rural Levees on Namoi River Floodplain

Realigned Section of Kamilaroi Highway

1000 1500 Existing Town Levee Centre Line and Chainage

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C3.1
(Sheet 2 of 2)

NAMOI RIVER TUFLOW MODEL LAYOUT

N

150 0 150 300 450 m

Scale: 1:15,000

Lyall & Associates

1000 1000 Existing Levee Centre Line and Chainage

FG_01 Flood Gate Location and Identifier

P_01 Pump Location and Identifier

LEGEND

- Junction Pit
- Inlet Pit
- Headwall
- Pipe / Box Culvert
- Two-Dimensional Model Boundary
- Outlet - Normal Depth
- Inflow - Rainfall on Girid

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C3.2

WEE WAA TUFLOW MODEL LAYOUT

TUFLOW HYDRAULIC ROUGHNESS SCHEMATISATION

- Roads
- Buildings
- Grassed/Paved Inter-Allotment Area

Indicative Depth of Inundation (m)

- 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

Note: Flow direction arrows are also shown in areas subject to depths of inundation less than 0.1 m.

BOUNDARY STREET

CHARLES STREET

N

20 0 20 40 60 m

Scale: 1:2,000

LEGEND

- Modelled Stormwater Network
- Building Outlines

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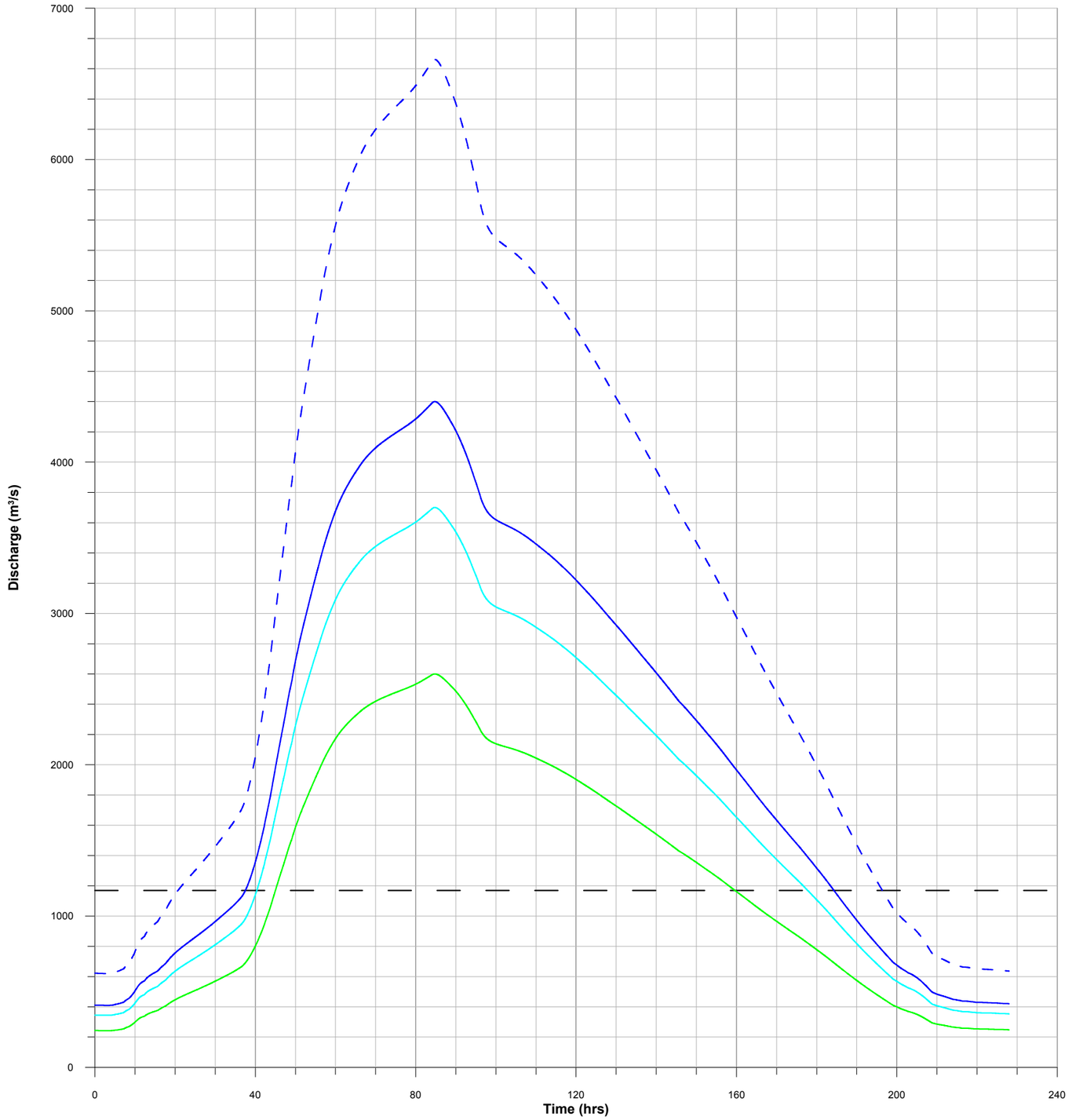
RISK MANAGEMENT STUDY AND PLAN

Figure C3.3

TUFLOW SCHEMATISATION OF FLOODPLAIN



LEGEND

- 1% AEP (DIPNR, 2003)
- 1% AEP
- 2% AEP
- 5% AEP
- Maximum Gauged Discharge (1,169 m³/s)

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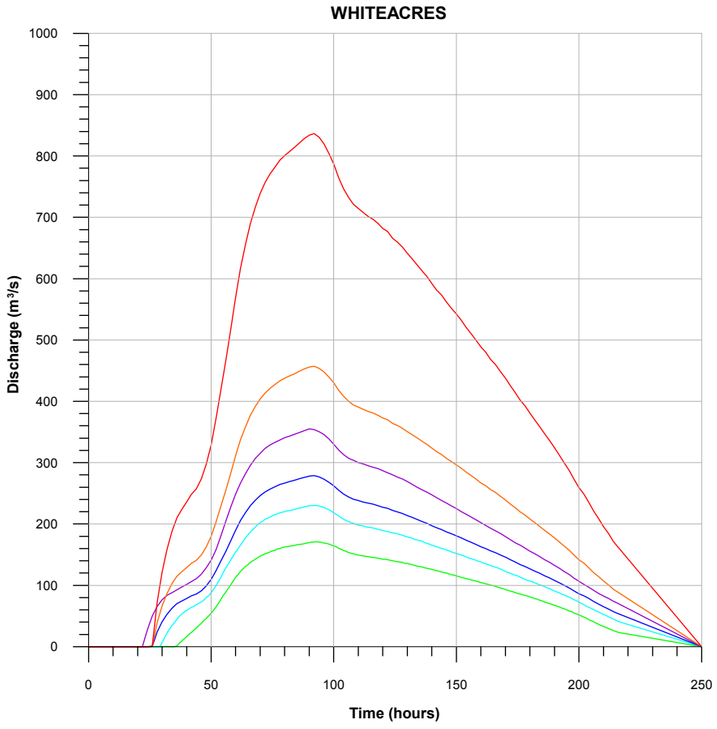
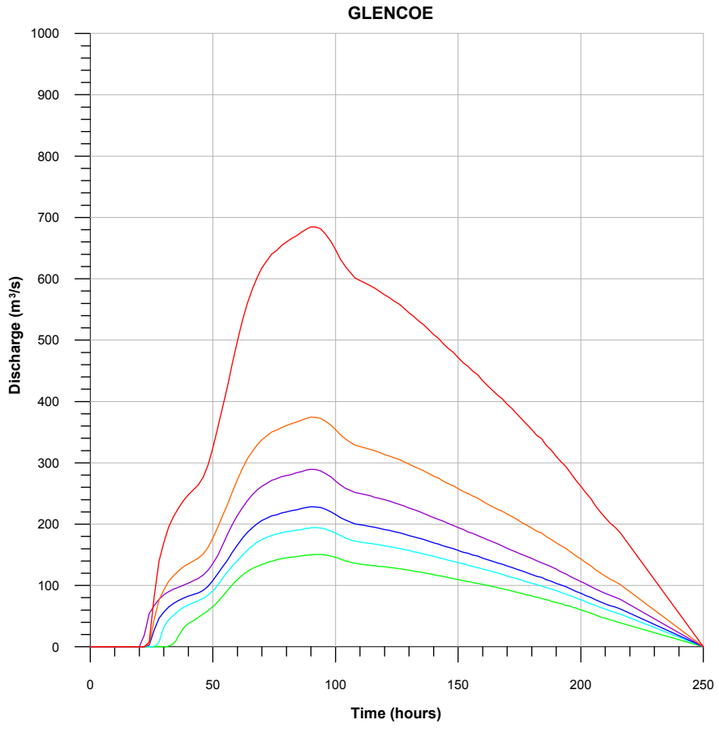
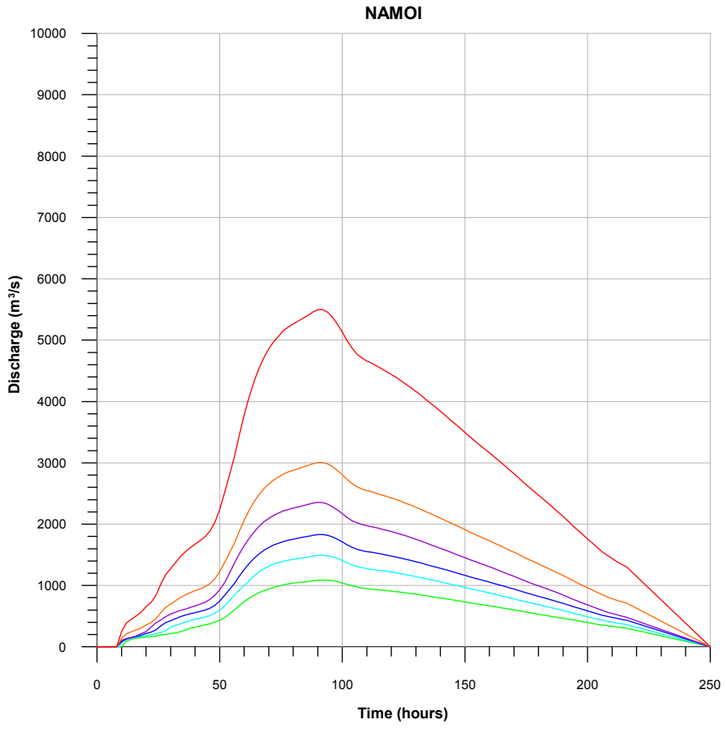
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

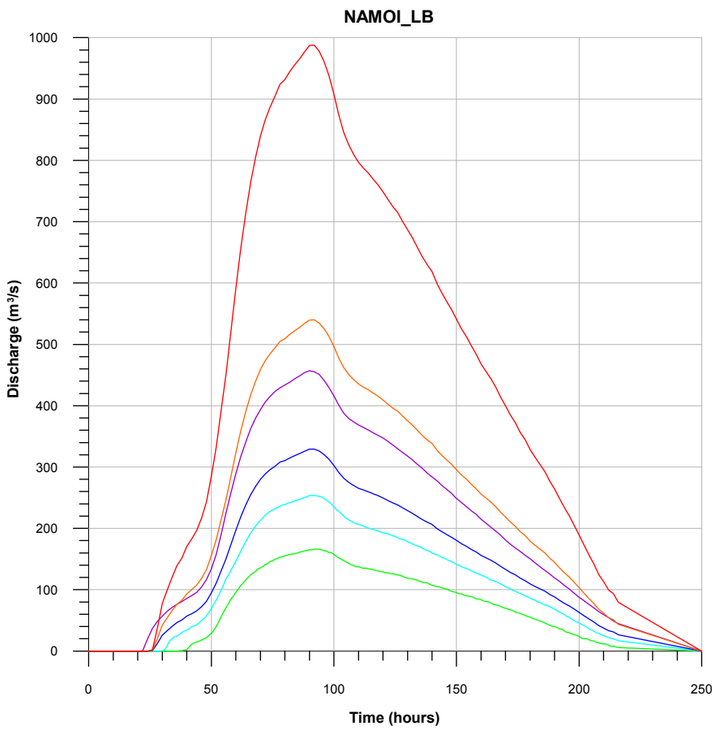
Figure C4.1

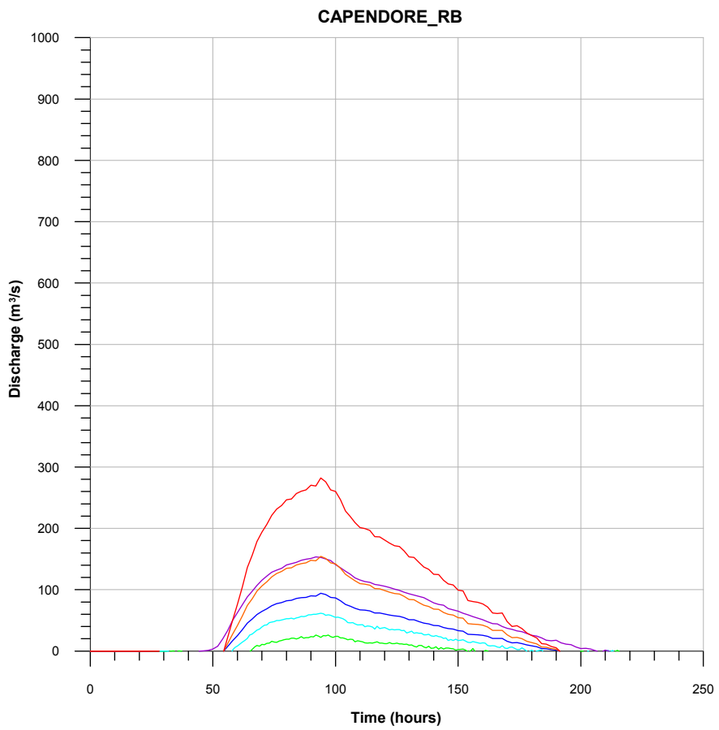
DESIGN DISCHARGE HYDROGRAPHS
NAMOI RIVER AT MOLLEE STREAM GAUGE (GS 419039)

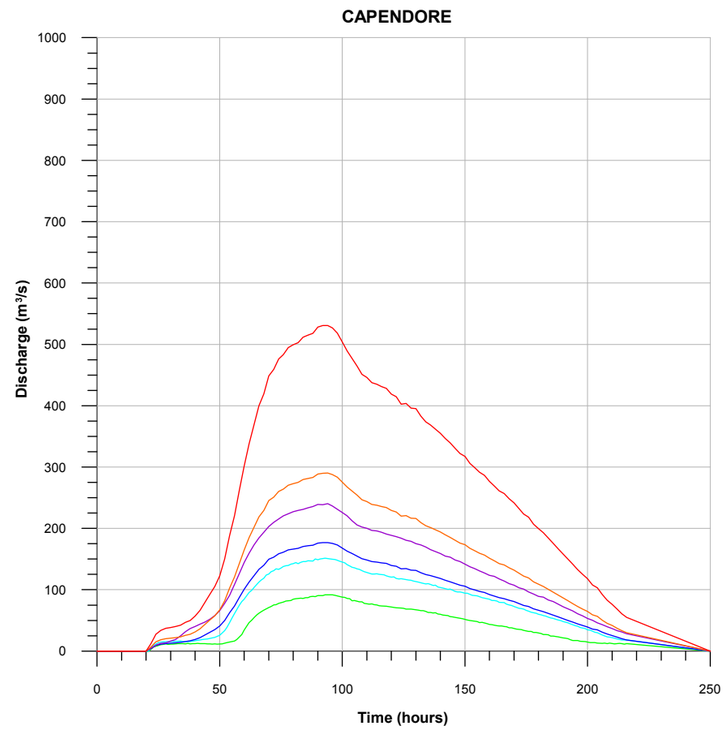












LEGEND

- Extreme Flood
- 0.2% AEP
- 0.5% AEP
- 1% AEP
- 2% AEP
- 5% AEP

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NOTE:

Refer **Figures B4.1** for location of discharge hydrographs.

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure C4.2

DESIGN DISCHARGE HYDROGRAPHS
NAMOI RIVER FLOODPLAIN UPSTREAM OF WEE WAA

APPENDIX E

FREEBOARD ANALYSIS

LIST OF FIGURES (APPENDIX E)

N

600 0 600 1200 1800 m

Scale: 1:60,000

Lyall & Associates

Note:

The ground surface model incorporated in TUFLOW is based on LiDAR survey which has been sampled on a 5m (min) 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
- WaterNSW Stream Gauge
- Existing Town Levee Centre Line
- Existing Rural Levees on Namoi River Floodplain
- 1% AEP Flood Extent (Depths Greater than 100 mm Only)
- A — Location and Identifier of Freeboard Assessment
- Centre Line of Effective Fetch
- Radial Projection

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

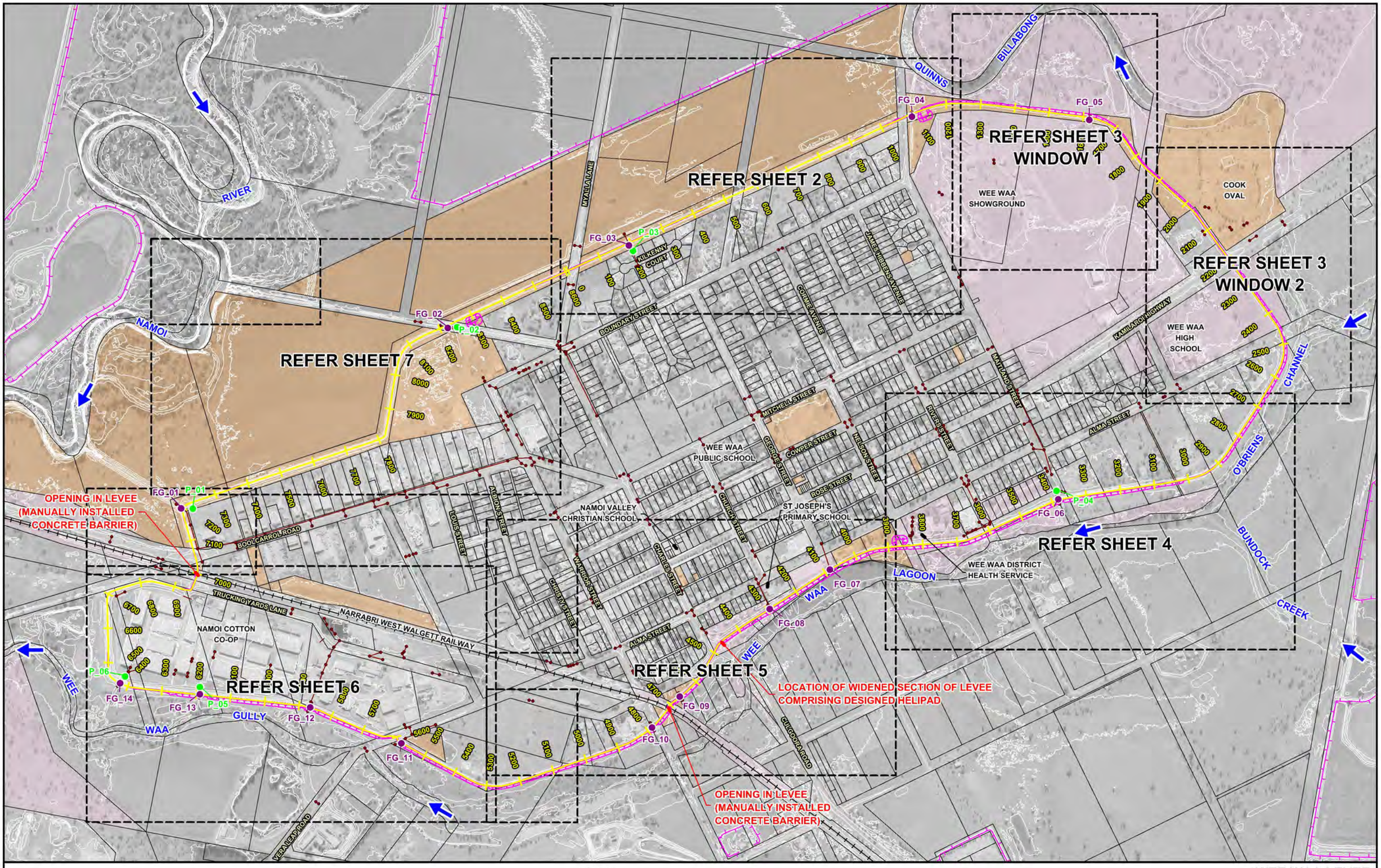
Figure E1.1

FLOOD EXTENTS AND EFFECTIVE FETCH LENGTHS 1% AEP NAMOI RIVER FLOOD

APPENDIX F

PRELIMINARY DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

LIST OF FIGURES (APPENDIX F)



N

100 0 100 200 300 m

Scale: 1:10,000

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LEGEND

- Existing Stormwater Network
- Levee Design Strings
- Crown Land
- Council Owned Land
- Existing Levee Centre Line and Chainage
- Flood Gate Location and Identifier
- Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.1
(Sheet 1 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

N

30 0 30 60 90 m

Scale: 1:3,000

Lyall & Associates

LEGEND

- Existing Stormwater Network
- Levee Design Strings
- Crown Land
- Council Owned Land
- 600 700 — Existing Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.1
(Sheet 2 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

WINDOW 1

WINDOW 2

QUINNS

BILLABONG

WEE WAA
SHOWGROUND

COOK
OVAL

KAMILROI HIGHWAY

ROSE STREET

PURCELL AVENUE

ALMA STREET

CHANNEL

O'BRIENS

FG_05

1300 1400 1500 1600 1700 1800 1900

1900 2000 2100 2200 2300 2400 2500 2600 2700

JOINS-SHEET-2

JOINS WINDOW 1

JOINS WINDOW 2

JOINS SHEET 4

N

30 0 30 60 90 m

Scale: 1:3,000

Lyall & Associates

LEGEND

- Existing Stormwater Network
- Levee Design Strings
- Crown Land
- Council Owned Land
- 2200 2300 Existing Levee Centre Line and Chainage
- FG_03 Flood Gates with Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.1
(Sheet 3 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

JOINS SHEET 3 - WINDOW 2

MAITLAND STREET

ALMA STREET

RIVERS STREET

CHANNEL

O'BRIENS

WEE

WAA

LAGOON

BUNDOCK

CREEK

HARRIS LANE

P_04

FG_06

2700

2800

2900

3000

3100

3200

3300

3400

3500

3600

3700

3800

3900

PROPOSED WESTERN HELIPAD

JOINS SHEET 5

N

30 0 30 60 90 m

Scale: 1:3,000

Lyall & Associates

LEGEND

- Existing Stormwater Network
- Levee Design Strings
- Crown Land
- Council Owned Land
- 3300 3200 Existing Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.1
(Sheet 4 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

INSET

JOINS MAIN WINDOW

MAIN WINDOW

JOINS SHEET 4

JOINS SHEET 6

JOINS INSET

NAMOI VALLEY CHRISTIAN SCHOOL

ST JOSEPTH'S PRIMARY SCHOOL

VERA LEAP ROAD

ROSE STREET

CHURCH STREET

GEORGE STREET

CHARLES STREET

ALMA STREET

WARRIOR STREET

NARRABRI WEST WALGETT RAILWAY

SHORT STREET

OPENING IN LEVEE AT RAILWAY CROSSING

CULGOORA ROAD

HARRIS LANE

EXISTING HELIPAD

LAGOON

WEE

WAA

GULLY

FG_07

FG_08

FG_09

FG_10

3800

4000

4100

4200

4300

4400

4500

4600

4700

4800

4900

5000

5100

5200

N

30 0 30 60 90 m

Scale: 1:3,000

LEGEND

Existing Stormwater Network

Levee Design Strings

Crown Land

Council Owned Land

4400 4300 Existing Levee Centre Line and Chainage

FG_01 Flood Gate Location and Identifier

Lyall & Associates

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.1
(Sheet 5 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

JOINS SHEET 7

OPENING IN LEVEE AT RAILWAY CROSSING

TRUCKING YARDS LANE

NARRABRI WEST WALGETT RAILWAY

LOUIS STREET

VERA LEAP ROAD

WEE

WAA

GULLY

P_06

P_05

FG_14

FG_13

FG_12

FG_11

7000 6900 6800 6700 6600 6500 6400 6300 6200 6100 6000 5900 5800 5700 5600 5500 5400 5300

JOINS SHEET 5

N

30 0 30 60 90 m

Scale: 1:3,000

Lyall & Associates

LEGEND

- Existing Stormwater Network
- Levee Design Strings
- Crown Land
- Council Owned Land
- 5800 5700 Existing Levee Centre Line and Chainage
- FG_01 Flood Gate Location and Identifier
- P_01 Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.1
(Sheet 6 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS

INSET

JOINS MAIN WINDOW

MAIN WINDOW

JOINS SHEET 2

JOINS SHEET 6

JOINS INSET

FG_01

P_01

FG_02

P_02

PROPOSED WESTERN HELIPAD

KAMILROI HIGHWAY

NARRABRI WEST WALGETT RAILWAY

BOOLCARROL ROAD

WARRIOR STREET

RIVER

NAMOI

7400

7300

7200

7100

7900

8000

8100

8200

8300

8400

8500

N

30 0 30 60 90 m

Scale: 1:3,000

Lyall & Associates

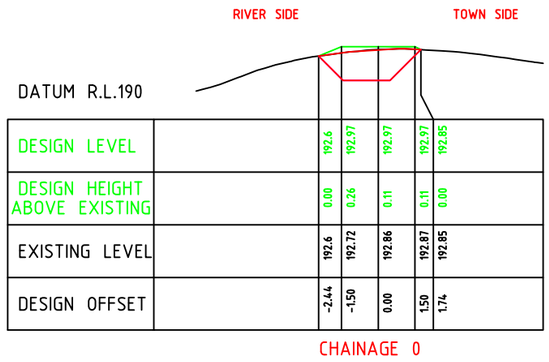
LEGEND

- Existing Stormwater Network
- Levee Design Strings
- Council Owned Land
- 7000 7007 — Existing Levee Centre Line and Chainage
- FG_01 — Flood Gate Location and Identifier
- P_01 — Pump Location and Identifier

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

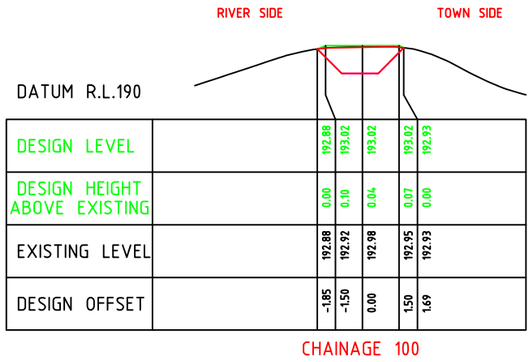
Figure F1.1
(Sheet 7 of 7)

DETAILS OF TOWN LEVEE UPGRADE REQUIREMENTS



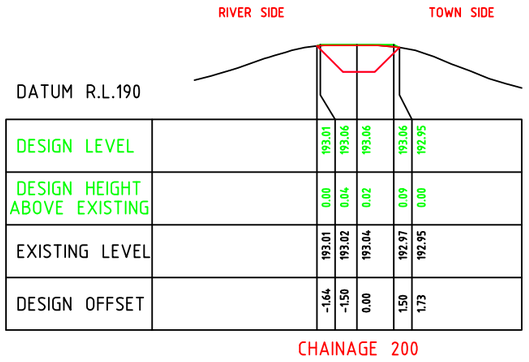
DESIGN LEVEL		192.6	192.97	192.97	192.97	192.85
DESIGN HEIGHT ABOVE EXISTING		0.00	0.26	0.11	0.11	0.00
EXISTING LEVEL		192.6	192.72	192.86	192.87	192.85
DESIGN OFFSET		-2.44	-1.50	0.00	1.50	1.74

CHAINAGE 0



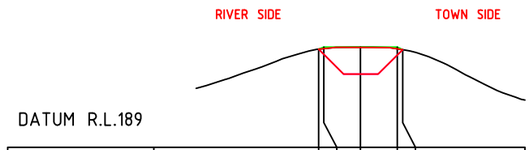
DESIGN LEVEL		192.88	193.02	193.02	193.02	192.93
DESIGN HEIGHT ABOVE EXISTING		0.00	0.10	0.04	0.07	0.00
EXISTING LEVEL		192.88	192.92	192.98	192.95	192.93
DESIGN OFFSET		-1.85	-1.50	0.00	1.50	1.69

CHAINAGE 100



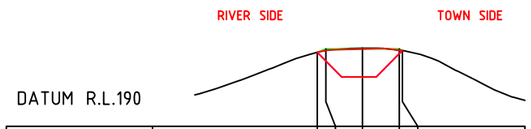
DESIGN LEVEL		193.01	193.06	193.06	193.06	192.95
DESIGN HEIGHT ABOVE EXISTING		0.00	0.04	0.02	0.09	0.00
EXISTING LEVEL		193.01	193.02	193.04	192.97	192.95
DESIGN OFFSET		-1.64	-1.50	0.00	1.50	1.73

CHAINAGE 200



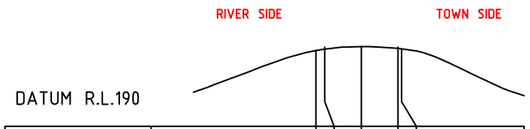
DESIGN LEVEL		193.01	193.09	193.09	193.09	192.98
DESIGN HEIGHT ABOVE EXISTING		0.00	0.06	0.00	0.07	0.00
EXISTING LEVEL		193.01	193.03	193.09	193.02	192.98
DESIGN OFFSET		-1.72	-1.50	0.00	1.50	1.72

CHAINAGE 300



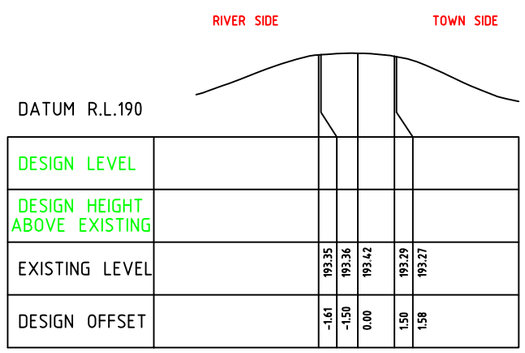
DESIGN LEVEL		193.01	193.16	193.16	193.16	193.09
DESIGN HEIGHT ABOVE EXISTING		0.00	0.06	-0.03	0.05	0.00
EXISTING LEVEL		193.01	193.1	193.19	193.1	193.09
DESIGN OFFSET		-1.85	-1.50	0.00	1.50	1.63

CHAINAGE 400



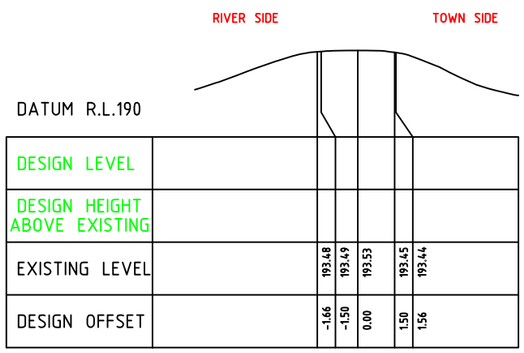
DESIGN LEVEL						
DESIGN HEIGHT ABOVE EXISTING						
EXISTING LEVEL		193.09	193.15	193.26	193.18	193.16
DESIGN OFFSET		-1.86	-1.50	0.00	1.50	1.65

CHAINAGE 500



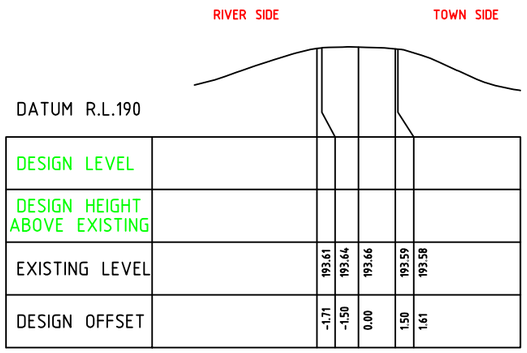
DESIGN LEVEL						
DESIGN HEIGHT ABOVE EXISTING						
EXISTING LEVEL		193.35	193.36	193.42	193.29	193.27
DESIGN OFFSET		-1.61	-1.50	0.00	1.50	1.58

CHAINAGE 600



DESIGN LEVEL						
DESIGN HEIGHT ABOVE EXISTING						
EXISTING LEVEL		193.48	193.49	193.53	193.45	193.44
DESIGN OFFSET		-1.66	-1.50	0.00	1.50	1.56

CHAINAGE 700



DESIGN LEVEL						
DESIGN HEIGHT ABOVE EXISTING						
EXISTING LEVEL		193.61	193.64	193.66	193.59	193.58
DESIGN OFFSET		-1.71	-1.50	0.00	1.50	1.61

CHAINAGE 800

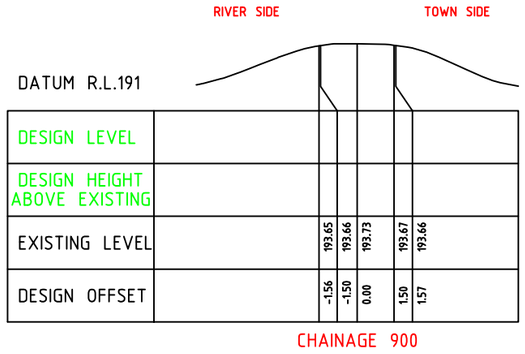
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 1 of 10)

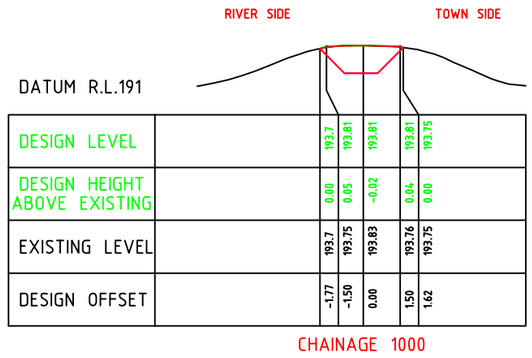
CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250



CHAINAGE 900



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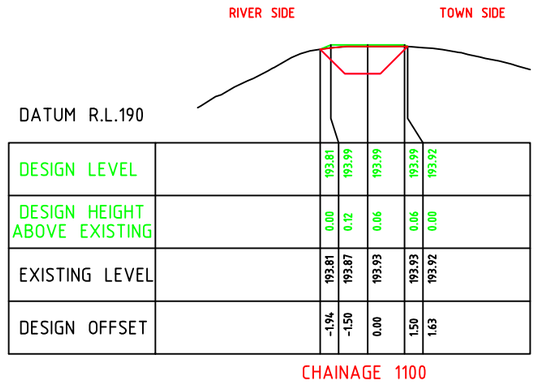
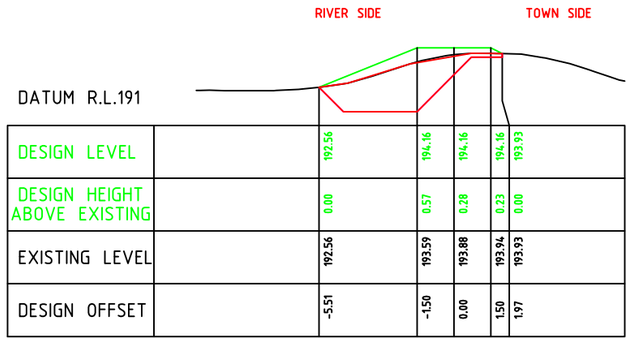
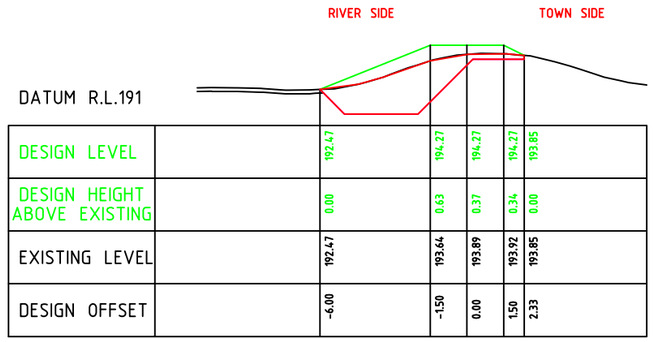


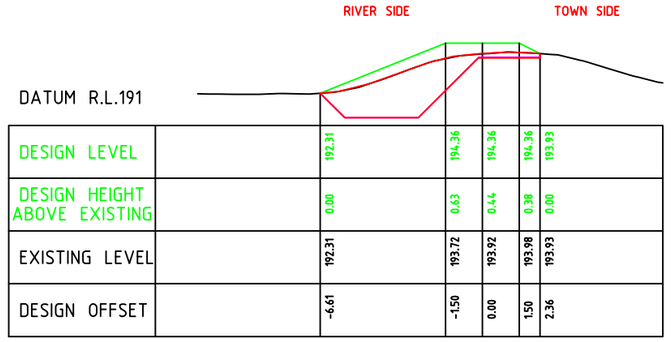
CHAINAGE 1100



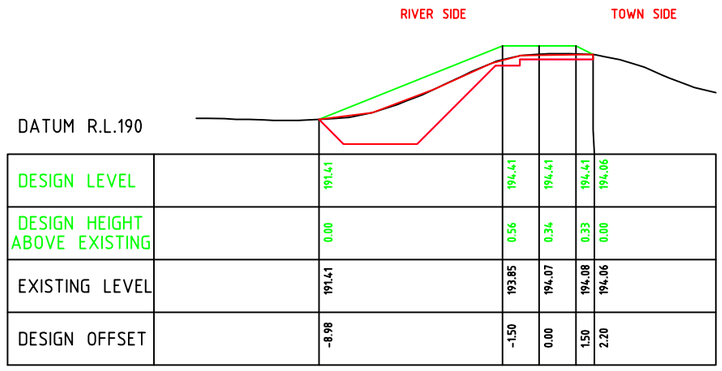
CHAINAGE 1200



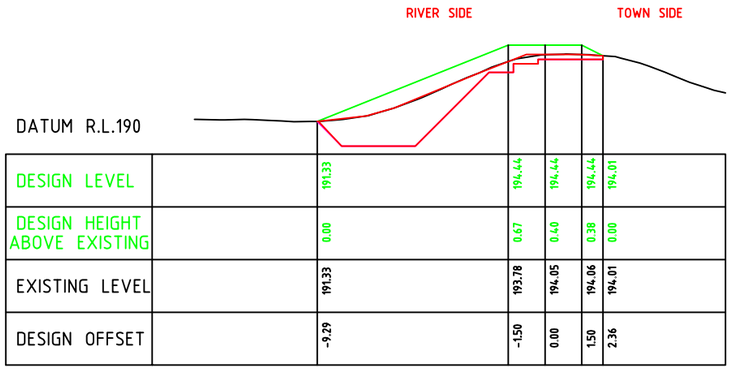
CHAINAGE 1300



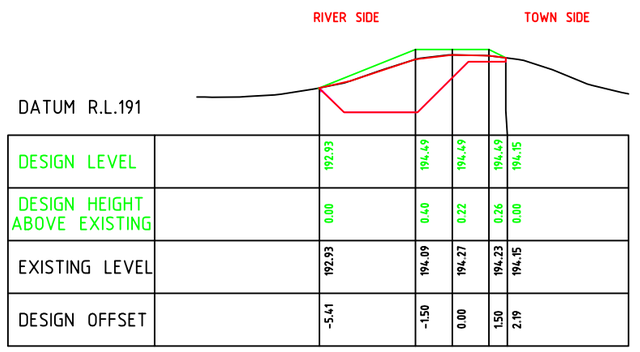
CHAINAGE 1400



CHAINAGE 1500



CHAINAGE 1600



CHAINAGE 1700

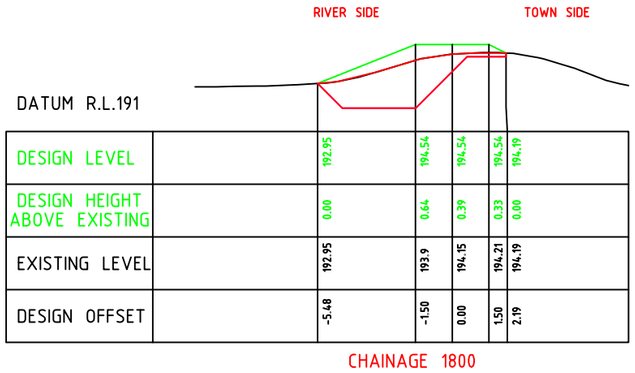
Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250

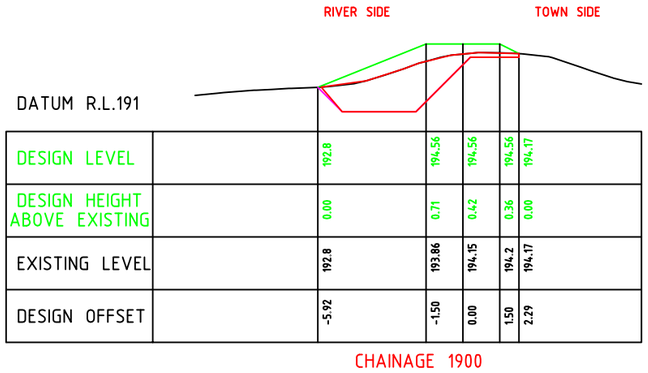
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 2 of 10)

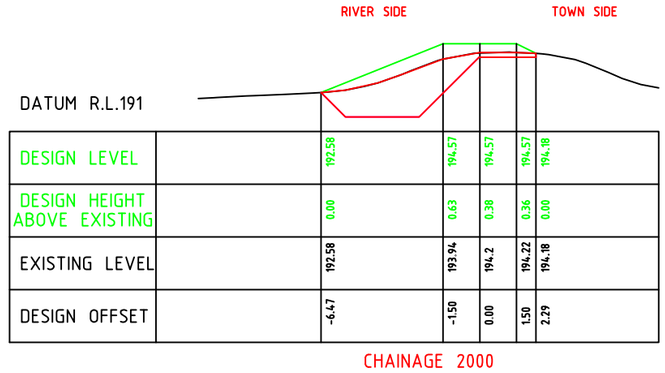
CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS



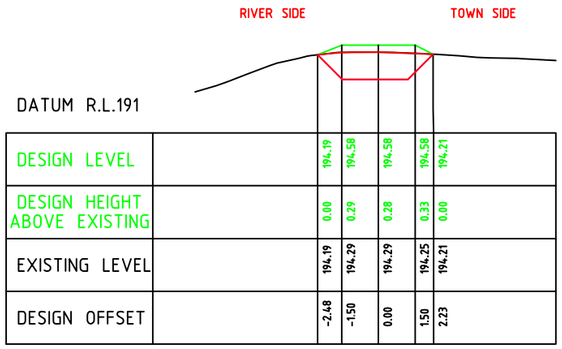
CHAINAGE 1800



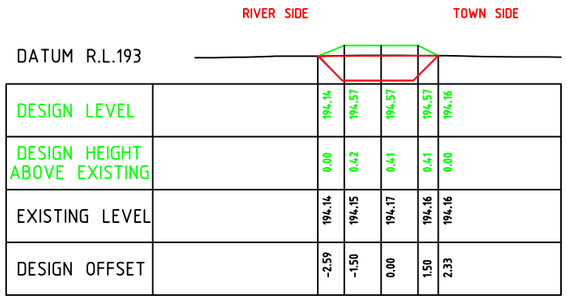
CHAINAGE 1900



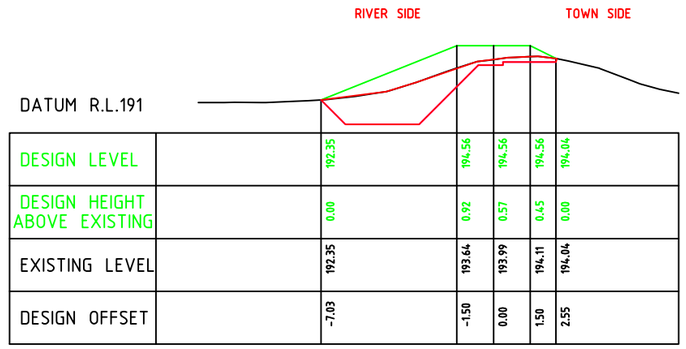
CHAINAGE 2000



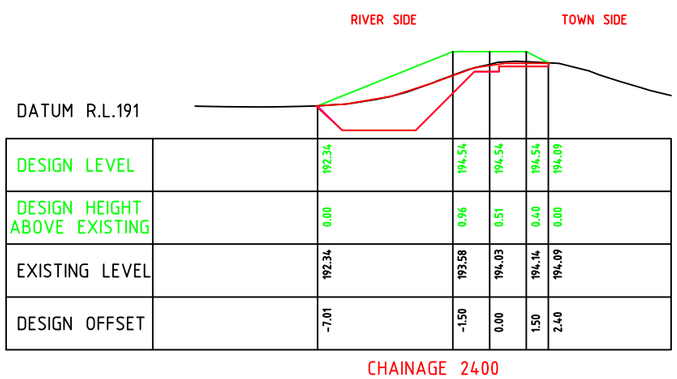
CHAINAGE 2100



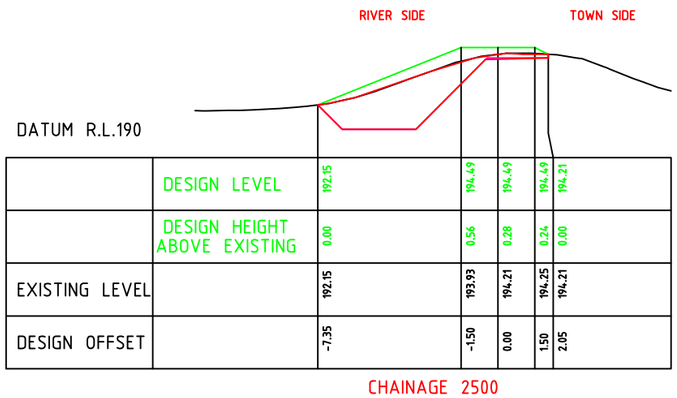
CHAINAGE 2200



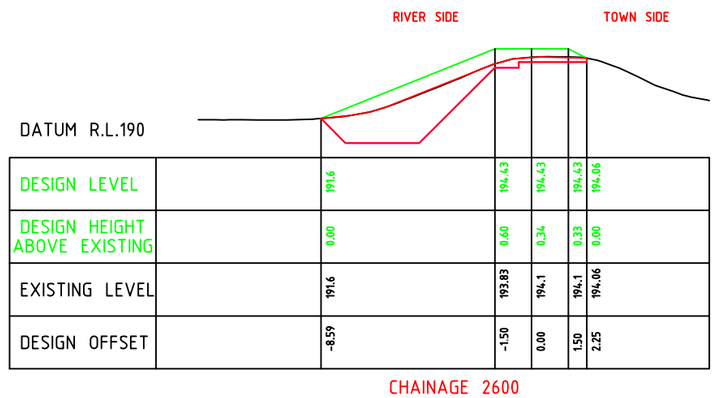
CHAINAGE 2300



CHAINAGE 2400



CHAINAGE 2500



CHAINAGE 2600

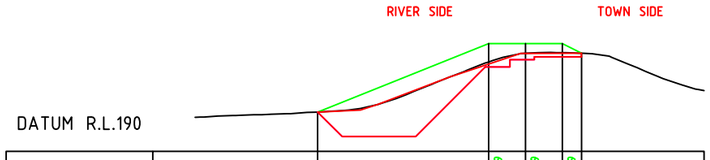
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 3 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250



DATUM R.L.190

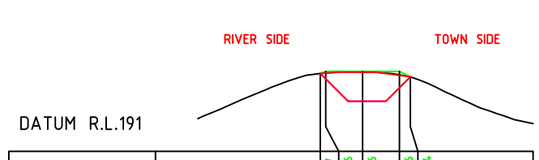
DESIGN LEVEL		191.6	194.39	194.39	194.39	194
DESIGN HEIGHT ABOVE EXISTING		0.00	0.75	0.39	0.37	0.00
EXISTING LEVEL		191.6	193.64	194	194.02	194
DESIGN OFFSET		-8.47	-1.50	0.00	1.50	2.28

CHAINAGE 2700

DATUM R.L.190

DESIGN LEVEL		191.44	194.33	194.33	194.33	193.96
DESIGN HEIGHT ABOVE EXISTING		0.00	0.51	0.27	0.28	0.00
EXISTING LEVEL		191.44	193.81	194.06	194.05	193.96
DESIGN OFFSET		-8.71	-1.50	0.00	1.50	2.24

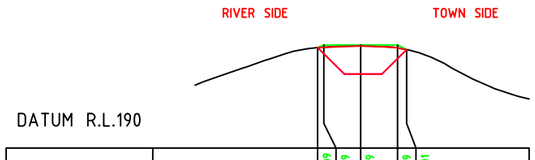
CHAINAGE 2800



DATUM R.L.191

DESIGN LEVEL			194.17	194.26	194.26	194.04
DESIGN HEIGHT ABOVE EXISTING			0.00	0.07	0.03	0.14	0.00
EXISTING LEVEL			194.17	194.2	194.23	194.12	194.04
DESIGN OFFSET			-1.72	-1.50	0.00	1.50	1.95

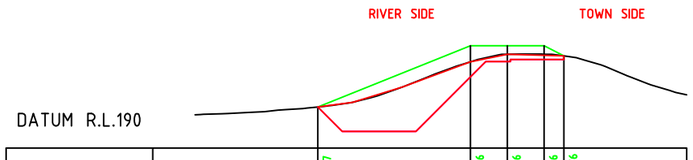
CHAINAGE 2900



DATUM R.L.190

DESIGN LEVEL		194.09	194.19	194.19	194.19	194.01
DESIGN HEIGHT ABOVE EXISTING		0.00	0.09	0.04	0.11	0.00
EXISTING LEVEL		194.09	194.11	194.15	194.08	194.01
DESIGN OFFSET		-1.75	-1.50	0.00	1.50	1.87

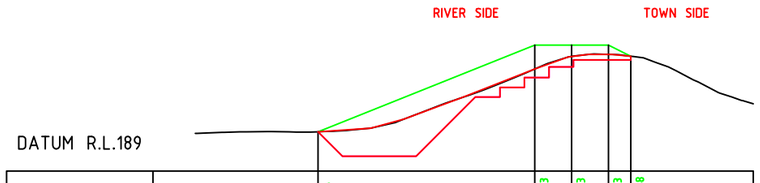
CHAINAGE 3000



DATUM R.L.190

DESIGN LEVEL		191.67	194.16	194.16	194.16	193.76
DESIGN HEIGHT ABOVE EXISTING		0.00	0.65	0.35	0.34	0.00
EXISTING LEVEL		191.67	193.51	193.82	193.82	193.76
DESIGN OFFSET		-7.73	-1.50	0.00	1.50	2.31

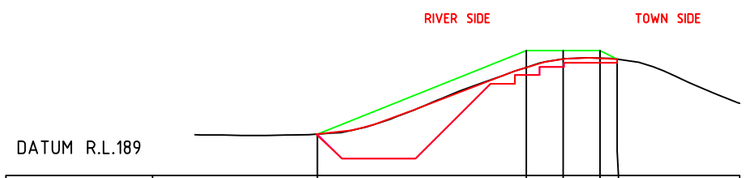
CHAINAGE 3100



DATUM R.L.189

DESIGN LEVEL		190.6	194.13	194.13	194.13	193.68
DESIGN HEIGHT ABOVE EXISTING		0.00	0.98	0.46	0.38	0.00
EXISTING LEVEL		190.6	193.15	193.67	193.75	193.68
DESIGN OFFSET		-10.34	-1.50	0.00	1.50	2.41

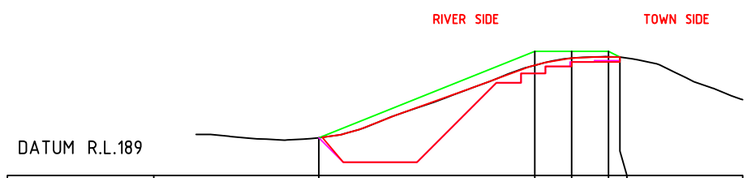
CHAINAGE 3200



DATUM R.L.189

DESIGN LEVEL		190.69	194.1	194.1	194.1	193.75
DESIGN HEIGHT ABOVE EXISTING		0.00	0.69	0.34	0.31	0.00
EXISTING LEVEL		190.69	193.41	193.76	193.79	193.75
DESIGN OFFSET		-10.02	-1.50	0.00	1.50	2.20

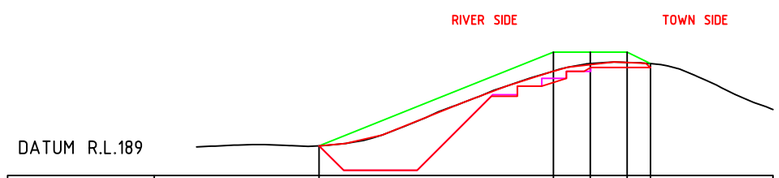
CHAINAGE 3300



DATUM R.L.189

DESIGN LEVEL		190.54	194.07	194.07	194.07	193.83
DESIGN HEIGHT ABOVE EXISTING		0.00	0.57	0.28	0.22	0.00
EXISTING LEVEL		190.54	193.49	193.79	193.85	193.83
DESIGN OFFSET		-10.31	-1.50	0.00	1.50	1.97

CHAINAGE 3400



DATUM R.L.189

DESIGN LEVEL		190.21	194.04	194.04	194.04	193.56
DESIGN HEIGHT ABOVE EXISTING		0.00	0.78	0.47	0.42	0.00
EXISTING LEVEL		190.21	193.26	193.57	193.61	193.56
DESIGN OFFSET		-11.06	-1.50	0.00	1.50	2.45

CHAINAGE 3500

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 4 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

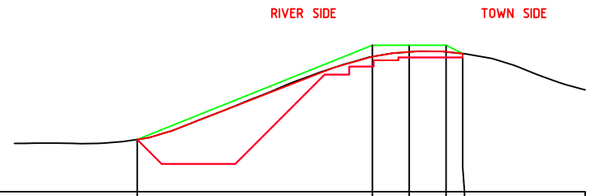
Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250

DATUM R.L.188

DESIGN LEVEL		190.23	194	194	194	193.57
DESIGN HEIGHT ABOVE EXISTING		0.00	0.82	0.47	0.39	0.00
EXISTING LEVEL		190.23	193.17	193.52	193.6	193.57
DESIGN OFFSET		-10.91	-1.50	0.00	1.50	2.36

CHAINAGE 3600



DATUM R.L.188

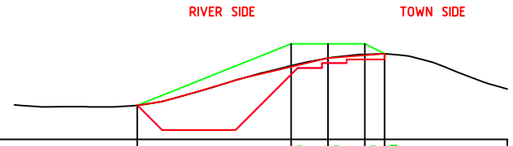
DESIGN LEVEL		190.12	193.96	193.96	193.96	193.62
DESIGN HEIGHT ABOVE EXISTING		0.00	0.46	0.27	0.27	0.00
EXISTING LEVEL		190.12	193.5	193.69	193.7	193.62
DESIGN OFFSET		-11.09	-1.50	0.00	1.50	2.18

CHAINAGE 3700

DATUM R.L.189

DESIGN LEVEL		190.4	193.92	193.92	193.92	193.58
DESIGN HEIGHT ABOVE EXISTING		0.00	0.64	0.34	0.32	0.00
EXISTING LEVEL		190.4	193.28	193.58	193.6	193.58
DESIGN OFFSET		-10.31	-1.50	0.00	1.50	2.17

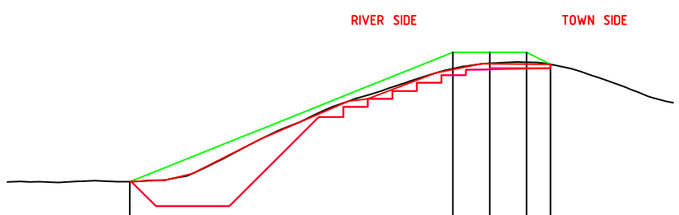
CHAINAGE 3800



DATUM R.L.190

DESIGN LEVEL		191.38	193.89	193.89	193.89	193.48
DESIGN HEIGHT ABOVE EXISTING		0.00	0.89	0.59	0.43	0.00
EXISTING LEVEL		191.38	193	193.3	193.46	193.48
DESIGN OFFSET		-7.78	-1.50	0.00	1.50	2.31

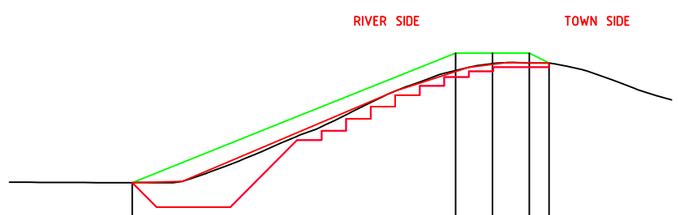
CHAINAGE 3900



DATUM R.L.187

DESIGN LEVEL		188.6	193.87	193.87	193.87	193.38
DESIGN HEIGHT ABOVE EXISTING		0.00	0.66	0.44	0.40	0.00
EXISTING LEVEL		188.6	193.21	193.43	193.47	193.38
DESIGN OFFSET		-14.67	-1.50	0.00	1.50	2.48

CHAINAGE 4000



DATUM R.L.187

DESIGN LEVEL		188.56	193.84	193.84	193.84	193.44
DESIGN HEIGHT ABOVE EXISTING		0.00	0.71	0.42	0.40	0.00
EXISTING LEVEL		188.56	193.13	193.42	193.44	193.44
DESIGN OFFSET		-14.69	-1.50	0.00	1.50	2.31

CHAINAGE 4100

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 5 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

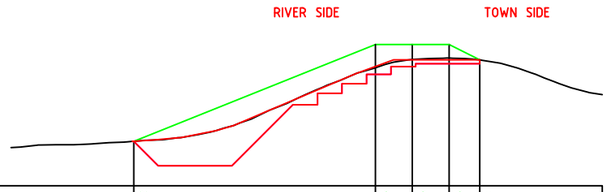
Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250

DATUM R.L.188

DESIGN LEVEL		190.45	193.8	193.8	193.8	193.32
DESIGN HEIGHT ABOVE EXISTING		0.00	0.69	0.44	0.42	0.00
EXISTING LEVEL		190.45	193.1	193.36	193.38	193.32
DESIGN OFFSET		-9.86	-1.50	0.00	1.50	2.45

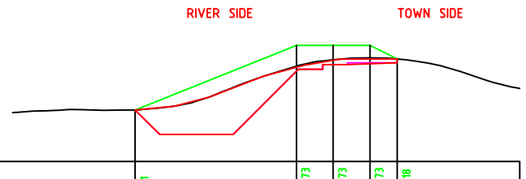
CHAINAGE 4200



DATUM R.L.188

DESIGN LEVEL		189.82	193.76	193.76	193.76	193.13
DESIGN HEIGHT ABOVE EXISTING		0.00	0.95	0.61	0.55	0.00
EXISTING LEVEL		189.82	192.81	193.15	193.21	193.13
DESIGN OFFSET		-11.36	-1.50	0.00	1.50	2.75

CHAINAGE 4300



DATUM R.L.189

DESIGN LEVEL		191.1	193.73	193.73	193.73	193.18
DESIGN HEIGHT ABOVE EXISTING		0.00	0.84	0.58	0.51	0.00
EXISTING LEVEL		191.1	192.89	193.15	193.22	193.18
DESIGN OFFSET		-8.07	-1.50	0.00	1.50	2.61

CHAINAGE 4400

DATUM R.L.191

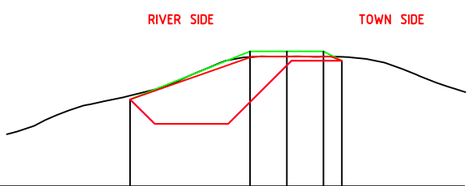
DESIGN LEVEL		193.26	193.62	193.62	193.62	193.26
DESIGN HEIGHT ABOVE EXISTING		0.00	0.35	0.32	0.34	0.00
EXISTING LEVEL		193.26	193.27	193.3	193.28	193.26
DESIGN OFFSET		-2.41	-1.50	0.00	1.50	2.22

CHAINAGE 4500

DATUM R.L.189

DESIGN LEVEL		190.76	193.56	193.56	193.56	193.26
DESIGN HEIGHT ABOVE EXISTING		0.00	0.38	0.22	0.27	0.00
EXISTING LEVEL		190.76	193.18	193.34	193.29	193.26
DESIGN OFFSET		-8.50	-1.50	0.00	1.50	2.10

CHAINAGE 4600



DATUM R.L.188

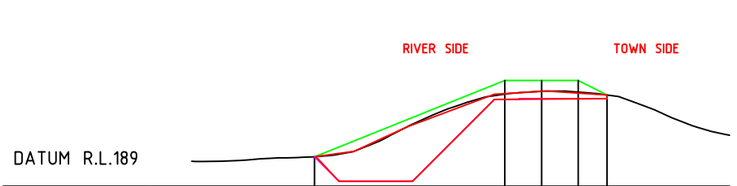
DESIGN LEVEL		191.54	193.49	193.49	193.49	193.12
DESIGN HEIGHT ABOVE EXISTING		0.00	0.38	0.36	0.36	0.00
EXISTING LEVEL		191.54	193.11	193.13	193.13	193.12
DESIGN OFFSET		-6.38	-1.50	0.00	1.50	2.25

CHAINAGE 4700

DATUM R.L.188

DESIGN LEVEL		190.01	193.4	193.4	193.4	193.01
DESIGN HEIGHT ABOVE EXISTING		0.00	0.47	0.36	0.35	0.00
EXISTING LEVEL		190.01	192.93	193.04	193.05	193.01
DESIGN OFFSET		-9.97	-1.50	0.00	1.50	2.27

CHAINAGE 4800



DATUM R.L.189

DESIGN LEVEL		190.2	193.3	193.3	193.3	192.712
DESIGN HEIGHT ABOVE EXISTING		0.00	0.55	0.43	0.47	0.00
EXISTING LEVEL		190.2	192.75	192.87	192.83	192.72
DESIGN OFFSET		-9.26	-1.50	0.00	1.50	2.67

CHAINAGE 4900

Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 6 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

DATUM R.L.189

DESIGN LEVEL		190.36	193.23	193.23	193.23	192.73
DESIGN HEIGHT ABOVE EXISTING		0.00	0.79	0.52	0.46	0.00
EXISTING LEVEL		190.36	192.44	192.71	192.77	192.73
DESIGN OFFSET		-8.68	-1.50	0.00	1.50	2.51

CHAINAGE 5000

DATUM R.L.189

DESIGN LEVEL		190.48	193.16	193.16	193.16	192.55
DESIGN HEIGHT ABOVE EXISTING		0.00	0.58	0.50	0.52	0.00
EXISTING LEVEL		190.48	192.58	192.66	192.64	192.55
DESIGN OFFSET		-8.19	-1.50	0.00	1.50	2.71

CHAINAGE 5100

DATUM R.L.189

DESIGN LEVEL		190.54	193.08	193.08	193.08	192.56
DESIGN HEIGHT ABOVE EXISTING		0.00	0.60	0.47	0.45	0.00
EXISTING LEVEL		190.54	192.48	192.61	192.63	192.56
DESIGN OFFSET		-7.84	-1.50	0.00	1.50	2.53

CHAINAGE 5200

DATUM R.L.189

DESIGN LEVEL		192.44	192.64	192.64	192.64	192.47
DESIGN HEIGHT ABOVE EXISTING		0.00	0.14	0.12	0.16	0.00
EXISTING LEVEL		192.44	192.5	192.52	192.48	192.47
DESIGN OFFSET		-1.99	-1.50	0.00	1.50	1.84

CHAINAGE 5300

DATUM R.L.189

DESIGN LEVEL		190.15	192.88	192.88	192.88	192.41
DESIGN HEIGHT ABOVE EXISTING		0.00	0.74	0.52	0.45	0.00
EXISTING LEVEL		190.15	192.13	192.36	192.42	192.41
DESIGN OFFSET		-8.32	-1.50	0.00	1.50	2.43

CHAINAGE 5400

DATUM R.L.189

DESIGN LEVEL		190.13	192.83	192.83	192.83	192.25
DESIGN HEIGHT ABOVE EXISTING		0.00	0.85	0.61	0.54	0.00
EXISTING LEVEL		190.13	191.98	192.21	192.29	192.25
DESIGN OFFSET		-8.25	-1.50	0.00	1.50	2.65

CHAINAGE 5500

DATUM R.L.191

DESIGN LEVEL		192.46	192.78	192.78	192.78	192.44
DESIGN HEIGHT ABOVE EXISTING		0.00	0.33	0.33	0.33	0.00
EXISTING LEVEL		192.46	192.45	192.44	192.44	192.44
DESIGN OFFSET		-2.29	-1.50	0.00	1.50	2.17

CHAINAGE 5600

DATUM R.L.188

DESIGN LEVEL		189.6	192.72	192.72	192.72	192.13
DESIGN HEIGHT ABOVE EXISTING		0.00	0.64	0.42	0.41	0.00
EXISTING LEVEL		189.6	192.07	192.3	192.3	192.13
DESIGN OFFSET		-9.29	-1.50	0.00	1.50	2.67

CHAINAGE 5700

DATUM R.L.188

DESIGN LEVEL		189.39	192.67	192.67	192.67	192.16
DESIGN HEIGHT ABOVE EXISTING		0.00	0.96	0.57	0.47	0.00
EXISTING LEVEL		189.39	191.71	192.1	192.2	192.16
DESIGN OFFSET		-9.70	-1.50	0.00	1.50	2.52

CHAINAGE 5800

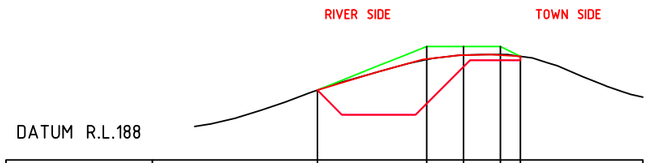
Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 7 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS



DATUM R.L.188

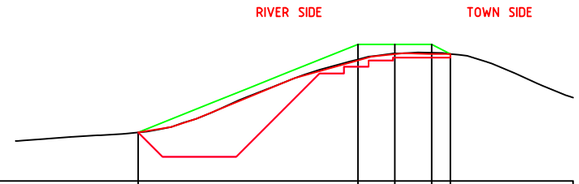
DESIGN LEVEL		190.85	192.63	192.63	192.63	192.22
DESIGN HEIGHT ABOVE EXISTING		0.00	0.54	0.35	0.33	0.00
EXISTING LEVEL		190.85	192.09	192.28	192.3	192.22
DESIGN OFFSET		-5.96	-1.50	0.00	1.50	2.32

CHAINAGE 5900

DATUM R.L.187

DESIGN LEVEL		189.1	192.61	192.61	192.61	192.23
DESIGN HEIGHT ABOVE EXISTING		0.00	0.40	0.23	0.28	0.00
EXISTING LEVEL		189.1	192.21	192.37	192.33	192.23
DESIGN OFFSET		-10.28	-1.50	0.00	1.50	2.25

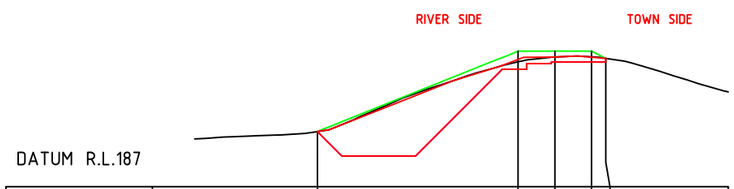
CHAINAGE 6000



DATUM R.L.187

DESIGN LEVEL		188.98	192.57	192.57	192.57	192.18
DESIGN HEIGHT ABOVE EXISTING		0.00	0.61	0.36	0.34	0.00
EXISTING LEVEL		188.98	191.96	192.2	192.23	192.18
DESIGN OFFSET		-10.46	-1.50	0.00	1.50	2.27

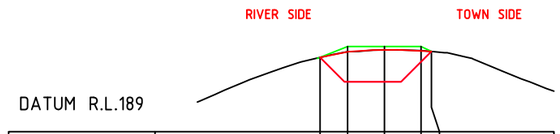
CHAINAGE 6100



DATUM R.L.187

DESIGN LEVEL		189.25	192.52	192.52	192.52	192.23
DESIGN HEIGHT ABOVE EXISTING		0.00	0.43	0.23	0.23	0.00
EXISTING LEVEL		189.25	192.09	192.29	192.29	192.23
DESIGN OFFSET		-9.68	-1.50	0.00	1.50	2.07

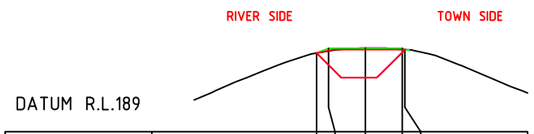
CHAINAGE 6200



DATUM R.L.189

DESIGN LEVEL		192.03	192.48	192.48	192.48	192.27
DESIGN HEIGHT ABOVE EXISTING		0.00	0.22	0.15	0.17	0.00
EXISTING LEVEL		192.03	192.26	192.33	192.3	192.27
DESIGN OFFSET		-2.62	-1.50	0.00	1.50	1.92

CHAINAGE 6300



DATUM R.L.189

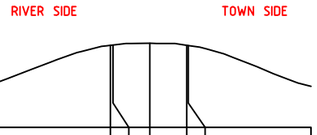
DESIGN LEVEL		192.21	192.4	192.4	192.4	192.35
DESIGN HEIGHT ABOVE EXISTING		0.00	0.11	-0.01	0.05	0.00
EXISTING LEVEL		192.21	192.29	192.41	192.35	192.35
DESIGN OFFSET		-1.99	-1.50	0.00	1.50	1.61

CHAINAGE 6400

DATUM R.L.189

DESIGN LEVEL		192.18	192.3	192.3	192.3	192.21
DESIGN HEIGHT ABOVE EXISTING		0.00	0.08	0.01	0.09	0.00
EXISTING LEVEL		192.18	192.22	192.29	192.22	192.21
DESIGN OFFSET		-1.81	-1.50	0.00	1.50	1.69

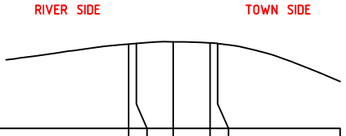
CHAINAGE 6500



DATUM R.L.189

DESIGN LEVEL						
DESIGN HEIGHT ABOVE EXISTING						
EXISTING LEVEL		192.35	192.36	192.43	192.35	192.34
DESIGN OFFSET		-1.61	-1.50	0.00	1.50	1.57

CHAINAGE 6600



DATUM R.L.189

DESIGN LEVEL						
DESIGN HEIGHT ABOVE EXISTING						
EXISTING LEVEL		192.43	192.46	192.53	192.48	192.46
DESIGN OFFSET		-1.82	-1.50	0.00	1.50	1.81

CHAINAGE 6700

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 8 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250

DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.39	192.47	192.32	192.28
DESIGN OFFSET		-1.50	0.00	1.50	1.72

CHAINAGE 6800

DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.43	192.43	192.53	192.38 192.35
DESIGN OFFSET		-1.50	-1.50	0.00	1.50 1.66

CHAINAGE 6900

DESIGN LEVEL		190.82	192.44	192.44	192.44	190.95
DESIGN HEIGHT ABOVE EXISTING		0.00	1.02	0.44	0.45	0.00
EXISTING LEVEL		190.82	191.42	192	191.99	190.95
DESIGN OFFSET		-5.55	-1.50	0.00	1.50	4.48

CHAINAGE 7000

DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.47	192.48	192.58	192.47 192.46
DESIGN OFFSET		-1.61	-1.50	0.00	1.50 1.61

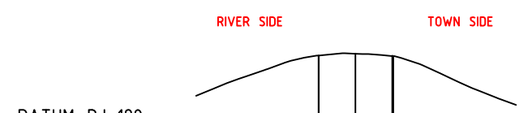
CHAINAGE 7100

DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.71	192.73	192.73	192.65 192.64
DESIGN OFFSET		-1.94	-1.50	0.00	1.50 1.71

CHAINAGE 7200

DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.6	192.6	192.73	192.67 192.65
DESIGN OFFSET		-1.51	-1.50	0.00	1.50 1.62

CHAINAGE 7300

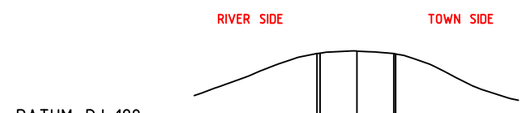


DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.62	192.62	192.69	192.6 192.6
DESIGN OFFSET		-1.51	-1.50	0.00	1.50 1.54

CHAINAGE 7400

DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.44	192.54	192.68	192.62 192.62
DESIGN OFFSET		-1.97	-1.50	0.00	1.50 1.52

CHAINAGE 7500



DESIGN LEVEL					
DESIGN HEIGHT ABOVE EXISTING					
EXISTING LEVEL		192.7	192.72	192.8	192.7 192.69
DESIGN OFFSET		-1.63	-1.50	0.00	1.50 1.58

CHAINAGE 7600

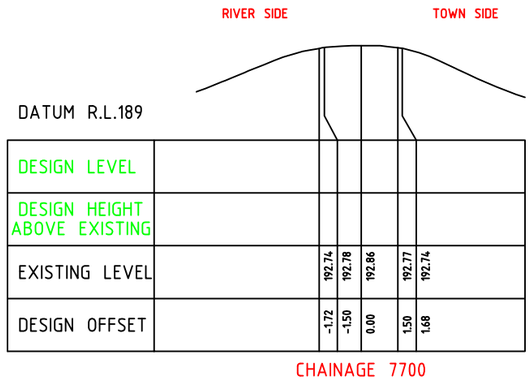
WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 9 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250



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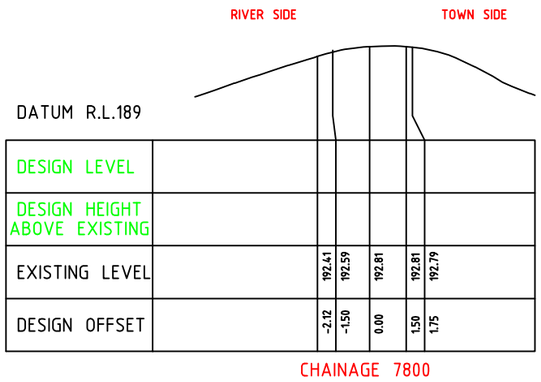

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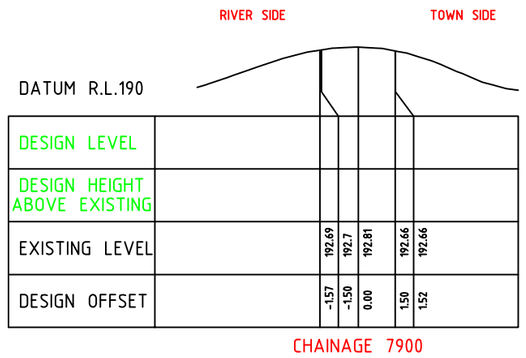

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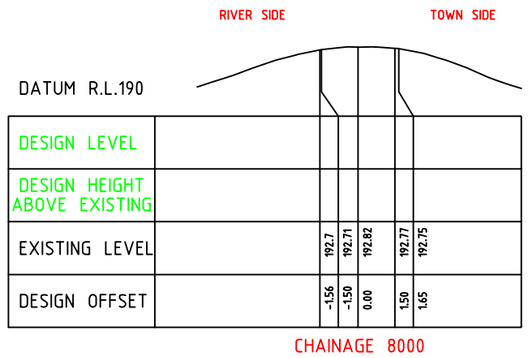
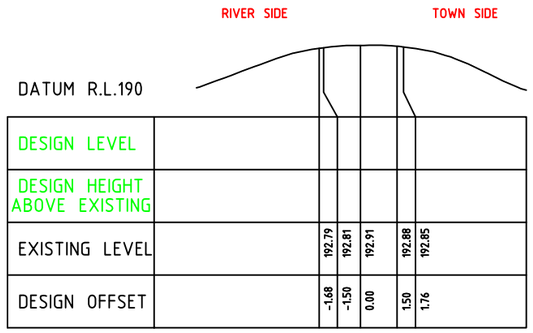
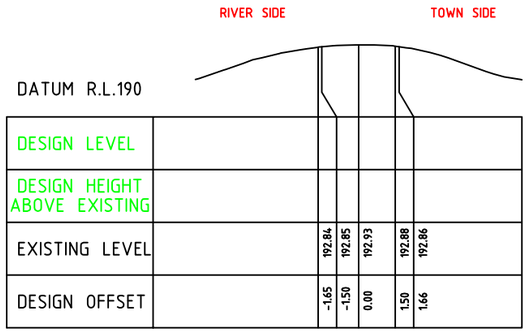


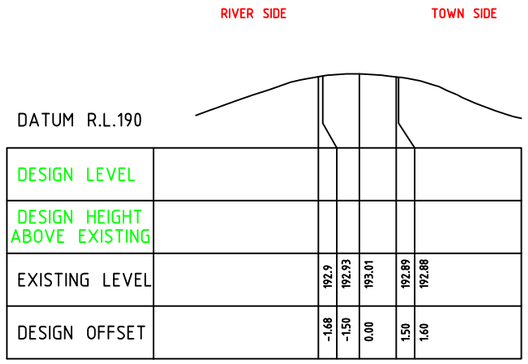
CHAINAGE 8000



CHAINAGE 8100



CHAINAGE 8200



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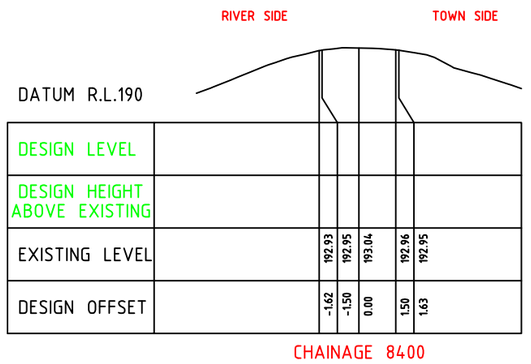
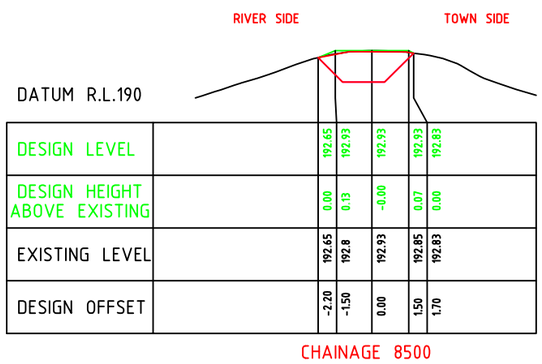


CHAINAGE 8400



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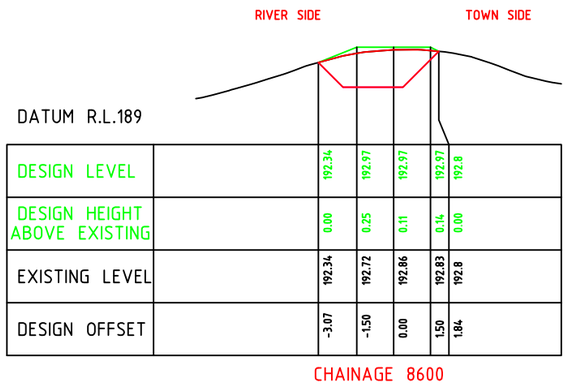

CHAINAGE 8600

WEE WAA LEVEE
RISK MANAGEMENT STUDY AND PLAN

Figure F1.2
(Sheet 10 of 10)

CROSS SECTIONS SHOWING
TOWN LEVEE UPGRADE REQUIREMENTS

Lyall & Associates

Scale
Vertical 1:250
Horizontal 1:250