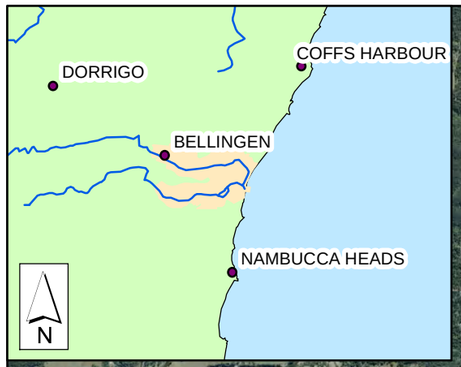
FIGURE 1
STUDY AREA



REPTON
NORTH BELLINGEN
BELLINGEN
Cemetery Creek
Bellinger River
Pacific Highway
RALEIGH
North Coast Railway
Tuckers Island
Pacific Ocean
Boggy Creek
Back Creek
Kalang River
Kalang River North Arm
Kalang River South Arm
URUNGA
NEWRY ISLAND
Uranga Lagoon
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
N
Reporting Locations
Hydraulic Model Extent
0 1 2 4 6
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure01_Study_Area_BK.mxd

FIGURE 2
PEAK FLOOD DEPTHS
1% AEP EVENT

REPTON
NORTH BELLINGEN
BELLINGEN
Cemetery Creek
Bellinger River
Pacific Highway
RALEIGH
North Coast Railway
Tuckers Island
Boggy Creek
Back Creek
Pacific Ocean
Kalang River North Arm
Kalang River
URUNGA
NEWRY ISLAND
Kalang River
Kalang River South Arm
Uranga Lagoon

N

Hydraulic Model Extent
Peak Flood Depth (m)
0 - 0.5
0.5 - 2
2 - 4
4 - 6
6 - 8
>8

0 1 2 4 6
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure02_Design_Flood_Envelope_Peak_Flood_Depths_100y_BK.mxd

FIGURE 3
PEAK FLOOD DEPTHS
1% AEP EVENT
BELLINGEN

Bellinger River
Sunset Ridge Dr
Kenny Cl
Elliot Cl
Wheatley St
Dowle St
Tamarind Dr
Lyon St
Casuarina Ave
Mccristal Dr
Jagera Dr
McNally St
NORTH BELLINGEN
Hammond St
Bellingen Showgrounds
Hydes Creek Rd
Frenchmans Creek
Jordan Rd
N Bank Rd
Hydes Creek
Coronation St
Robert St
William St
Hyde St
Bowra St
Church St
Ford St
Prince St
Watson St
BELLINGEN
Waterfall Way
Cemetery Creek

N

Hydraulic Model Extent
Peak Flood Depth (m)
0 - 0.5
0.5 - 2
2 - 4
4 - 6
6 - 8
>8

0 0.125 0.25 0.5 0.75
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure03_Design_Flood_Envelope_Peak_Flood_Depths_100y_Bellingen_BK.mxd

FIGURE 4
PEAK FLOOD DEPTHS
1% AEP EVENT
URUNGA

Yellow Rock Rd
Kalang River
Bellinger Ri
Newry Island Dr
Kalang River North Arm
Ginagay Way
Bellingen St
Atherton Dr
The Grove
Bowra St
URUNGA
Orara St
Pilot St E
Morgo St
South St E
Pilot St
High St
Ginagay Way
Hillside Dr
Hungry Head Rd
Urunga Lagoon
Kalang River North Arm
Kalang River
NEWRY ISLAND
Kalang River South Arm

N

Hydraulic Model Extent
Peak Flood Depth (m)
0 - 0.5
0.5 - 2
2 - 4
4 - 6
6 - 8
>8

0 0.125 0.25 0.5 0.75
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure04_Design_Flood_Envelope_Peak_Flood_Depths_100y_Urunga_BK.mxd

FIGURE 5
PEAK FLOOD DEPTHS
PMF EVENT

NORTH BELLINGEN
BELLINGEN
Cemetery Creek
Bellinger River
REPTON
Pacific Highway
RALEIGH
North Coast Railway
Tuckers Island
Boggy Creek
Back Creek
Pacific Ocean
Kalang River North Arm
Kalang River
URUNGA
Kalang River South Arm
NEWRY ISLAND
Kalang River
Urunga Lagoon

N

Hydraulic Model Extent
Peak Flood Depth (m)
0 - 0.5
0.5 - 2
2 - 4
4 - 6
6 - 8
>8

0 1 2 4 6
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure05_Design_Flood_Envelope_Peak_Flood_Depths_PMF_BK.mxd

FIGURE 6
PEAK FLOOD DEPTHS
PMF EVENT
BELLINGEN

Bellinger River
Sunset Ridge Dr
Kenny Cl
Elliot Cl
Wheatley St
Dowle St
Tamarind Dr
Lyon St
Casuarina Ave
Mccristal Dr
Jagera Dr
McNally St
NORTH BELLINGEN
Hammond St
Bellingen Showgrounds
Hydes Creek Rd
Fleetchmans Creek
Jordan Rd
N Bank Rd
Hydes Creek
Coronation St
Robert St
William St
Hyde St
Bowra St
Church St
Ford St
Prince St
Waterfall Way
Cemetery Creek
Watson St
BELLINGEN

N

Hydraulic Model Extent
Peak Flood Depth (m)
0 - 0.5
0.5 - 2
2 - 4
4 - 6
6 - 8
>8

0 0.125 0.25 0.5 0.75
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure06_Design_Flood_Envelope_Peak_Flood_Depths_PMF_Bellingen_BK.mxd

FIGURE 7
PEAK FLOOD DEPTHS
PMF EVENT
URUNGA

Yellow Rock Rd
Kalang River
Bellinger River
Newry Island Dr
Ginagay Way
Bellingen St
Atherton Dr
The Grove
URUNGA
Bowra St
Orara St
Pilot St E
Morgo St
South St E
Pilot St
High St
Ginagay Way
Hillside Dr
Hungry Head Rd
Urunga Lagoon
Kalang River North Arm
NEWRY ISLAND
Kalang River South Arm

N

Hydraulic Model Extent
Peak Flood Depth (m)
0 - 0.5
0.5 - 2
2 - 4
4 - 6
6 - 8
>8

0 0.125 0.25 0.5 0.75 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure07_Design_Flood_Envelope_Peak_Flood_Depths_PMF_Urunga_BK.mxd

FIGURE 8
HYDRAULIC HAZARD
1% AEP EVENT

NORTH BELLINGEN
BELLINGEN
Cemetery Creek
Bellinger River
REPTON
Pacific Highway
RALEIGH
North Coast Railway
Boggy Creek
Back Creek
Pacific Ocean
Kalang River North Arm
Kalang River
URUNGA
Kalang River South Arm
NEWRY ISLAND
Kalang River
Uranga Lagoon

N

Hydraulic Model Extent

Hazard

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

0 1 2 4 6 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure08_Design_Flood_Envelope_Hydraulic_Hazard_100y_BK.mxd

FIGURE 9
HYDRAULIC HAZARD
1% AEP EVENT
BELLINGEN

Bellinger River
Sunset Ridge Dr
Kenny Cl
Elliot Cl
Wheatley St
Dowle St
Tamarind Dr
Lyon St
Casuarina Ave
Mccristal Dr
Jagera Dr
McNally St
NORTH BELLINGEN
Hammond St
Bellingen Showgrounds
Hydes Creek Rd
Frenchmans Creek
Jordan Rd
N Bank Rd
Hydes Creek
Coronation St
Robert St
William St
Hyde St
Bowra St
Church St
Ford St
Prince St
Waterfall Way
Cemetery Creek
Watson St
BELLINGEN
N

Hydraulic Model

Hazard

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

0 0.125 0.25 0.5 0.75 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure09_Design_Flood_Envelope_Hydraulic_Hazard_100y_Bellingen_BK.mxd

FIGURE 10
HYDRAULIC HAZARD
1% AEP EVENT
URUNGA

Yellow Rock Rd
Kalang River
Bellinger River
Newry Island Dr
The Grove
Ginagay Way
Bellingen St
Atherton Dr
Bowra St
Orara St
URUNGA
Pilot St E
Morgo St
South St
Pilot St
High St
Ginagay Way
Hillside Dr
Hungry Head Rd
Urunga Lagoon
Kalang River North Arm
NEWRY ISLAND
Kalang River South Arm

N

Hydraulic Model Extent

Hazard

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

0 0.125 0.25 0.5 0.75 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure10_Design_Flood_Envelope_Hydraulic_Hazard_100y_Urunga_BK.mxd

FIGURE 11
HYDRAULIC HAZARD
PMF EVENT

NORTH BELLINGEN
BELLINGEN
REPTON
RALEIGH
Tuckers Island
Pacific Ocean
URUNGA
NEWRY ISLAND
Cemetery Creek
Bellinger River
Pacific Highway
North Coast Railway
Boggy Creek
Back Creek
Kalang River North Arm
Kalang River
Kalang River South Arm
Kalang River
Uranga Lagoon

N

Hydraulic Model Extent

Hazard

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

0 1 2 4 6 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure11_Design_Flood_Envelope_Hydraulic_Hazard_PMF_BK.mxd

FIGURE 12
HYDRAULIC HAZARD
PMF EVENT
BELLINGEN

Bellinger River
Sunset Ridge Dr
Kenny Cl
Elliot Cl
Wheatley St
Dowle St
Tamarind Dr
Lyon St
Casuarina Ave
Mccristal Dr
Jagera Dr
McNally St
NORTH BELLINGEN
Hammond St
Bellingen Showgrounds
Hydes Creek Rd
Frenchmans Creek
N Bank Rd
Jordan Rd
Hydes Creek
Coronation St
Robert St
William St
Hyde St
Bowra St
Church St
Ford St
Prince St
Watson St
BELLINGEN
Waterfall Way
Cemetery Creek

N

Hydraulic Model

Hazard

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

0 0.125 0.25 0.5 0.75 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure12_Design_Flood_Envelope_Hydraulic_Hazard_PMF_Bellingen_BK.mxd

FIGURE 13
HYDRAULIC HAZARD
PMF EVENT
URUNGA

Yellow Rock Rd
Kalang River
Bellinger River
Newry Island Dr
Ginagay Way
Bellingen St
Atherton Dr
The Grove
Bowra St
Orara St
URUNGA
Pilot St E
Morgo St
South St E
Kalang River North Arm
Pilot St
High St
Ginagay Way
Hillside Dr
Hungry Head Rd
Urunga Lagoon
NEWRY ISLAND
Kalang River South Arm

N

Hydraulic Model Extent

Hazard

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

0 0.125 0.25 0.5 0.75 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure13_Design_Flood_Envelope_Hydraulic_Hazard_PMF_Urunga_BK.mxd

FIGURE 14
FLOOD PLANNING LEVEL
1% AEP EVENT + 0.5M

NORTH BELLINGEN
BELLINGEN
Cemetery Creek
Bellinger River
REPTON
Pacific Highway
RALEIGH
North Coast Railway
Tuckers Island
Boggy Creek
Back Creek
Pacific Ocean
Kalang River North Arm
Kalang River
URUNGA
NEWRY ISLAND
Kalang River South Arm
Kalang River
Urunga Lagoon

N

Hydraulic Model Extent
Flood Planning Level (m AHD)
High : 15
Low : 2

0 1 2 4 6
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure14_FPL_100y_plus_05m_BK.mxd

FIGURE 15
FLOOD PLANNING LEVEL
1% AEP EVENT + 0.5M
BELLINGEN

Bellinger River
Sunset Ridge Dr
Kenny Cl
Elliot Cl
Wheatley St
Dowle St
Tamarind Dr
Lyon St
Casuarina Ave
Mccristal Dr
Jagera Dr
McNally St
NORTH BELLINGEN
Hammond St
Bellingen Showgrounds
Hydes Creek Rd
Frenchmans Creek
Jordan Rd
N Bank Rd
Hydes Creek
Coronation St
Robert St
William St
Hyde St
Bowra St
Church St
Ford St
Prince St
Waterfall Way
Cemetery Creek
Watson St
BELLINGEN
N
Hydraulic Model Extent
Flood Planning Level (m AHD)
High : 20
Low : 10
0 0.125 0.25 0.5 0.75
km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure15_FPL_100y_plus_05m_Bellingen_BK.mxd

FIGURE 16
FLOOD PLANNING LEVEL
1% AEP EVENT + 0.5M
URUNGA

Yellow Rock Rd
Kalang River
Newry Island Dr
Ginagay Way
Bellingen St
Atherton Dr
The Grove
Bowra St
Orara St
URUNGA
Pilot St E
Morgo St
South St E
Kalang River North Arm
Pilot St
High St
Ginagay Way
Hillside Dr
Hungry Head Rd
Urunga Lagoon
NEWRY ISLAND
Kalang River South Arm

N

Hydraulic Model Extent
Flood Planning Level (m AHD)
High : 10
Low : 2

0 0.125 0.25 0.5 0.75 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure16_FPL_100y_plus_05m_Urunga_BK.mxd

FIGURE 17
MITIGATION OPTION PM1
RAISE LAVENDERS BRIDGE TO 2Y ARI LEVEL

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure17_Option_PM1_Raise_Lavenders_Bridge_to_2Y_ARI_Level.mxd

FIGURE 18
MITIGATION OPTION PM2
RAISE LAVENDERS BRIDGE TO 5Y ARI LEVEL

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure18_Option_PM2_Raise_Lavenders_Bridge_to_5Y_ARI_Level.mxd

FIGURE 19

MITIGATION OPTION PM3

RAISE NORTH BANK ROAD AT FRENCHMANS CREEK BY 0.5M

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure19_Option_PM3_Raise_North_Bank_Road_at_Frenchmans_Creek_by_0.5m.mxd

FIGURE 20
MITIGATION OPTION PM5
RAISE WATERFALL WAY LOWER OF 5Y ARI LEVEL

1
2
3
4
5
6
7
Cemetery Creek
Bellinger River

N

Waterfall Way
Cadastre
Hydraulic Model Extent

0 0.5 1 2 3 km

J:\Jobs\111036\ArcGIS\ArcMap\BK_FRMS\04_FRMP_MainReport\Figure20_Option_PM5_Raise_Waterfall_Way_lower_of_5Y_ARI_Level_or_500mm_Overlay.mxd