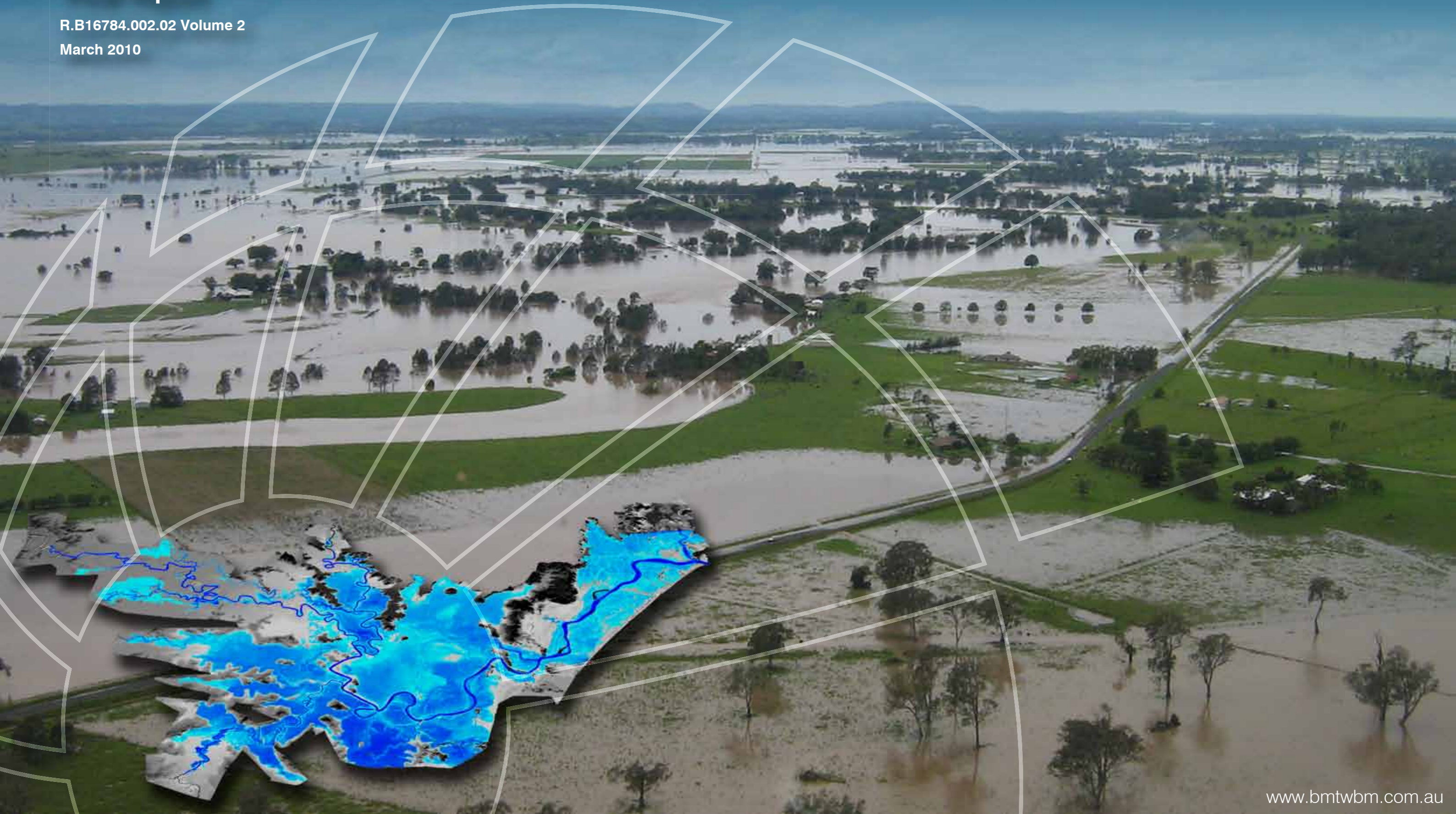


Richmond River Flood Mapping Study

Final Report

R.B16784.002.02 Volume 2

March 2010



Richmond River Flood Mapping Study Final Report

Volume 2 - Mapping

Prepared For: Richmond River County Council

Prepared By: BMT WBM Pty Ltd

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	Client : Richmond River County Council Client Contact: Michael Wood Client Reference

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Author :	Ben Caddis / Carrie Dearnley
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2	18 March 2010	SAW		BMC	16/03/2010

DISTRIBUTION

DESTINATION	REVISION			
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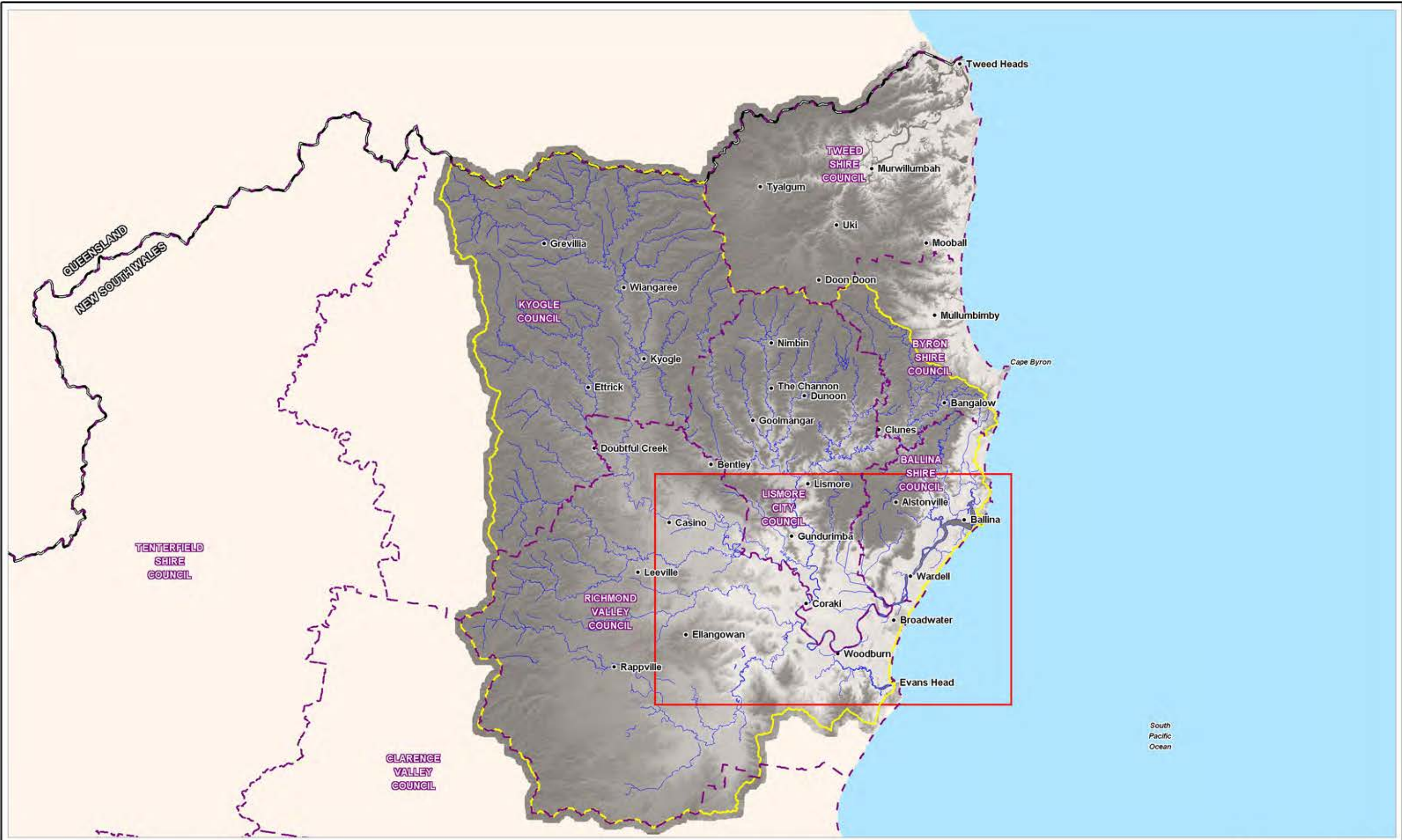
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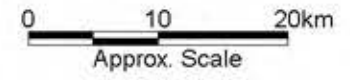


- LEGEND**
- ▬ Richmond River Catchment Boundary
 - ▭ Flood Study Area
 - - - Local Government Boundary
 - ▬ State Border
 - ▬ Waterways

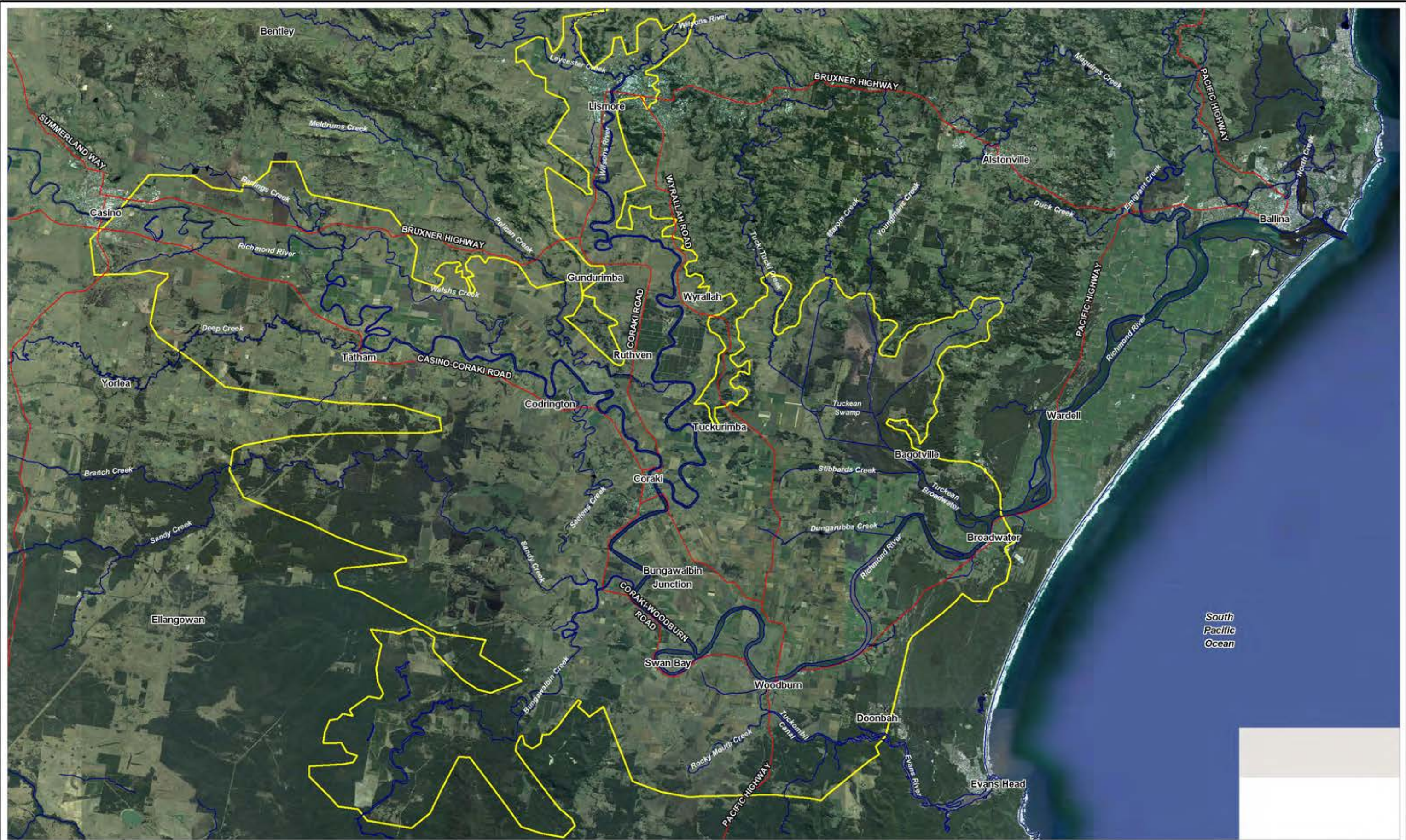
Title:
Richmond Valley Locality Plan

Map:	Rev:
2-1	A




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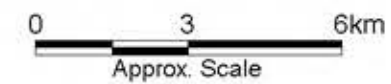


LEGEND

-  Extent of Flood Mapping
-  Roads
-  Waterways

Title:
Study Area

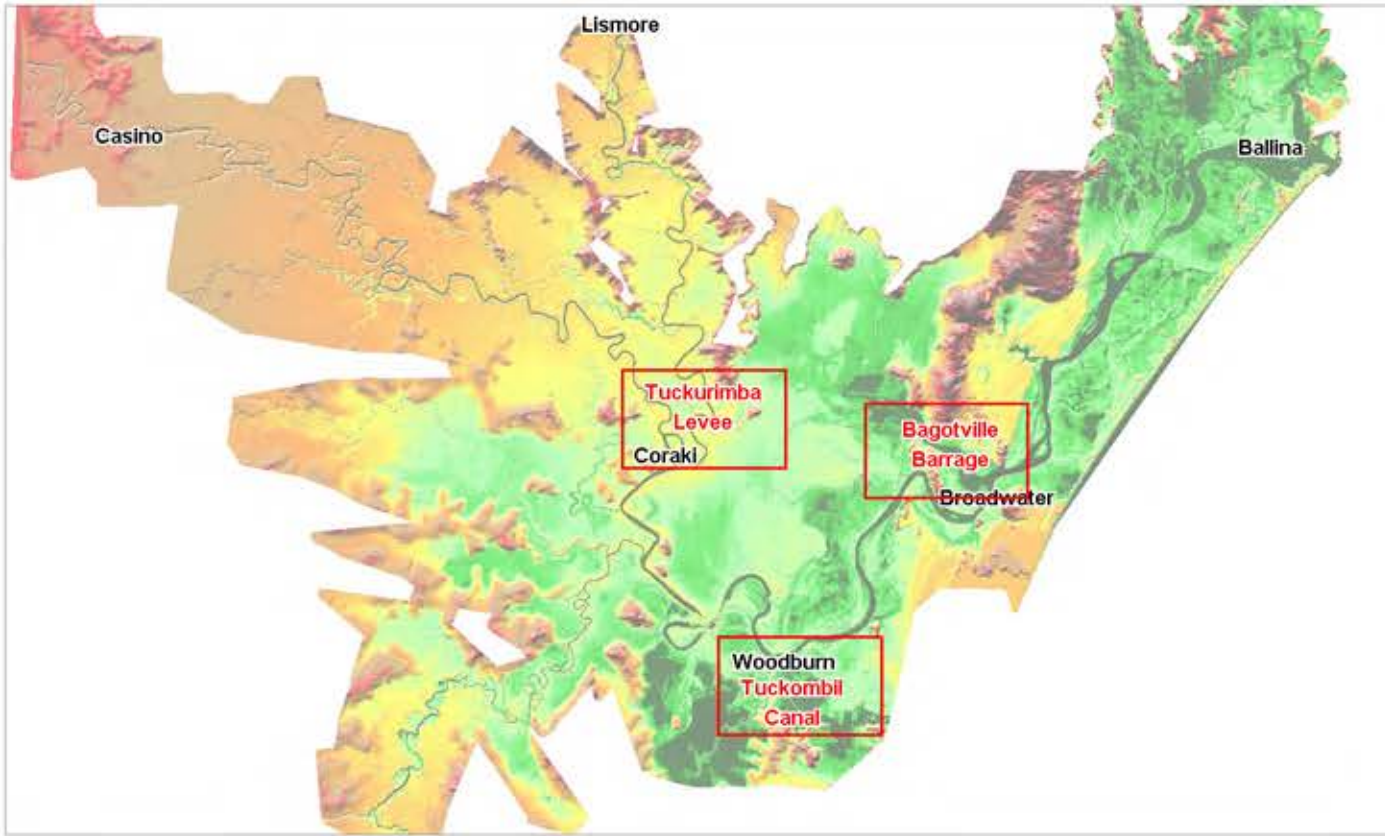
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Map:	Rev:
2-2	B



Locality



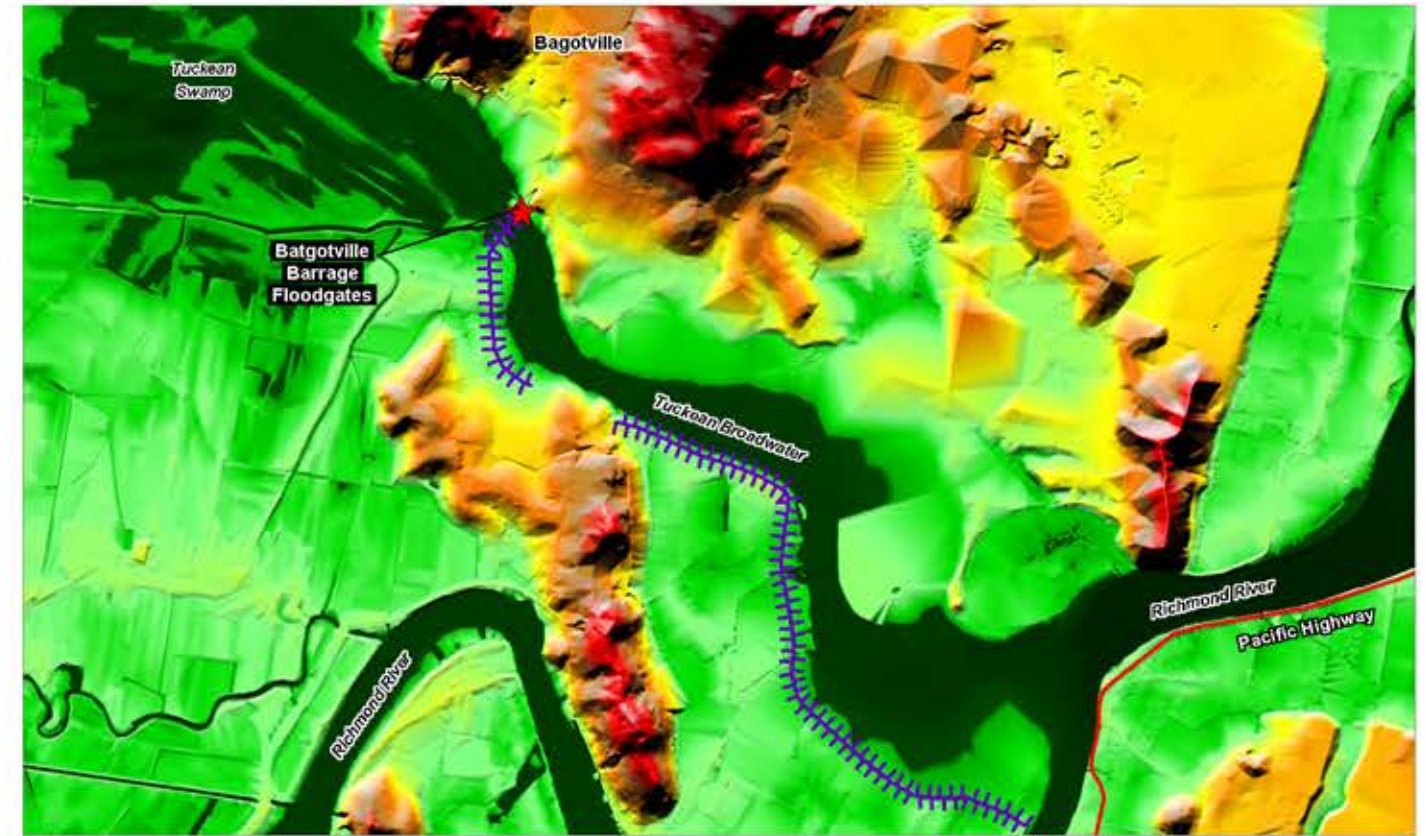
Tuckombil Canal and Rocky Mouth Creek Floodgates



Tuckurimba Levee



Bagotville Barrage



LEGEND

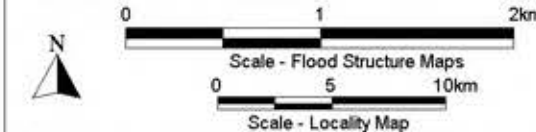
-  Road
-  Levee

Title:
Major Flood Structures

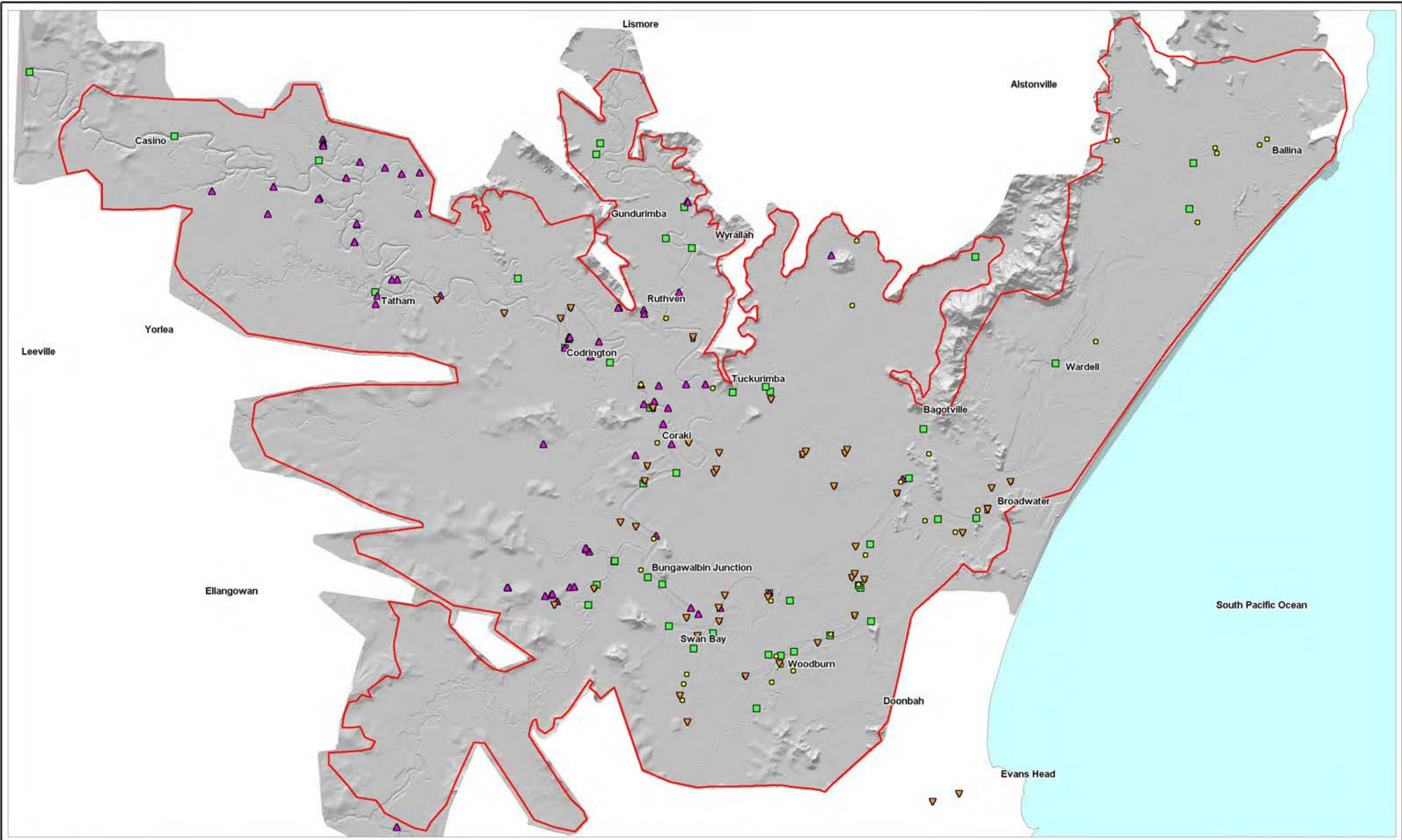
Map:
2-3






Rev:
A

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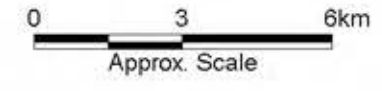
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- LEGEND**
-  2D Modelling Extent
 - Flood Level Survey**
 -  2009
 -  2008
 -  1974
 -  1954

Title:
Flood Level Survey

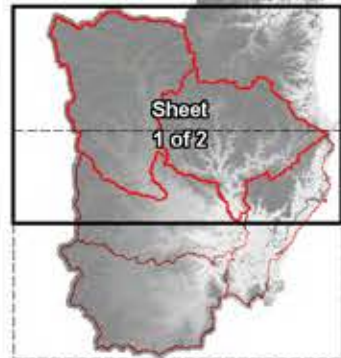
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Map:	Rev:
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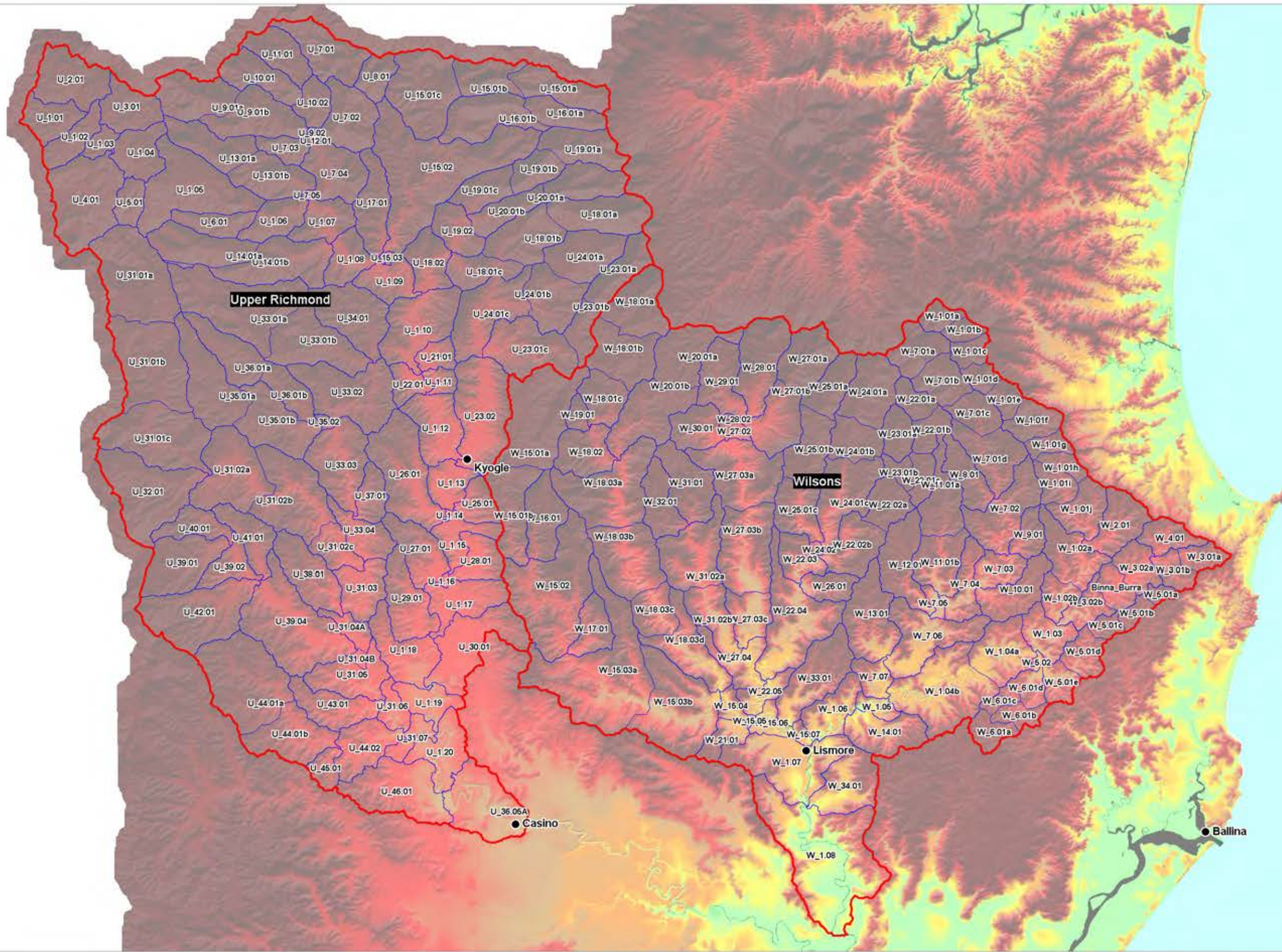


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Sheet
1 of 2

Key



LEGEND

- Hydrological Model Subcatchment Boundaries
- Subcatchment Number
- Sub-Model Boundary

Title:
**Sub-Catchment Plan - Sheet 1 of 2
(Upper Richmond and Wilsons Sub-Models)**

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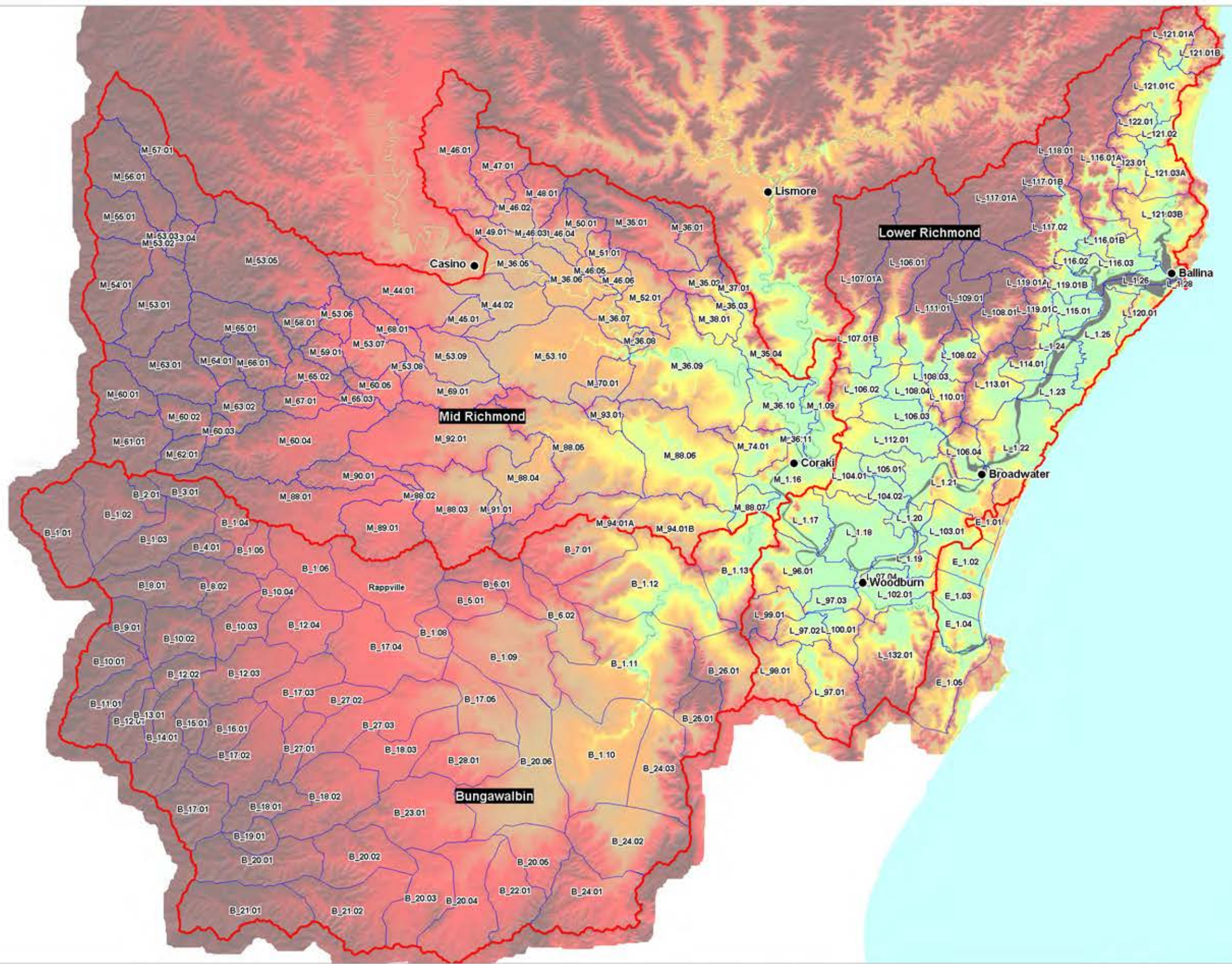
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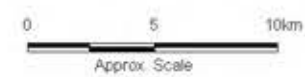


LEGEND

-  Hydrological Model Subcatchment Boundaries
- w_15.02** Subcatchment Number
-  Sub-Model Boundary

Title:
Sub-Catchment Plan - Sheet 2 of 2
(Mid Richmond, Bungawalbin and Lower Richmond Sub-Models)

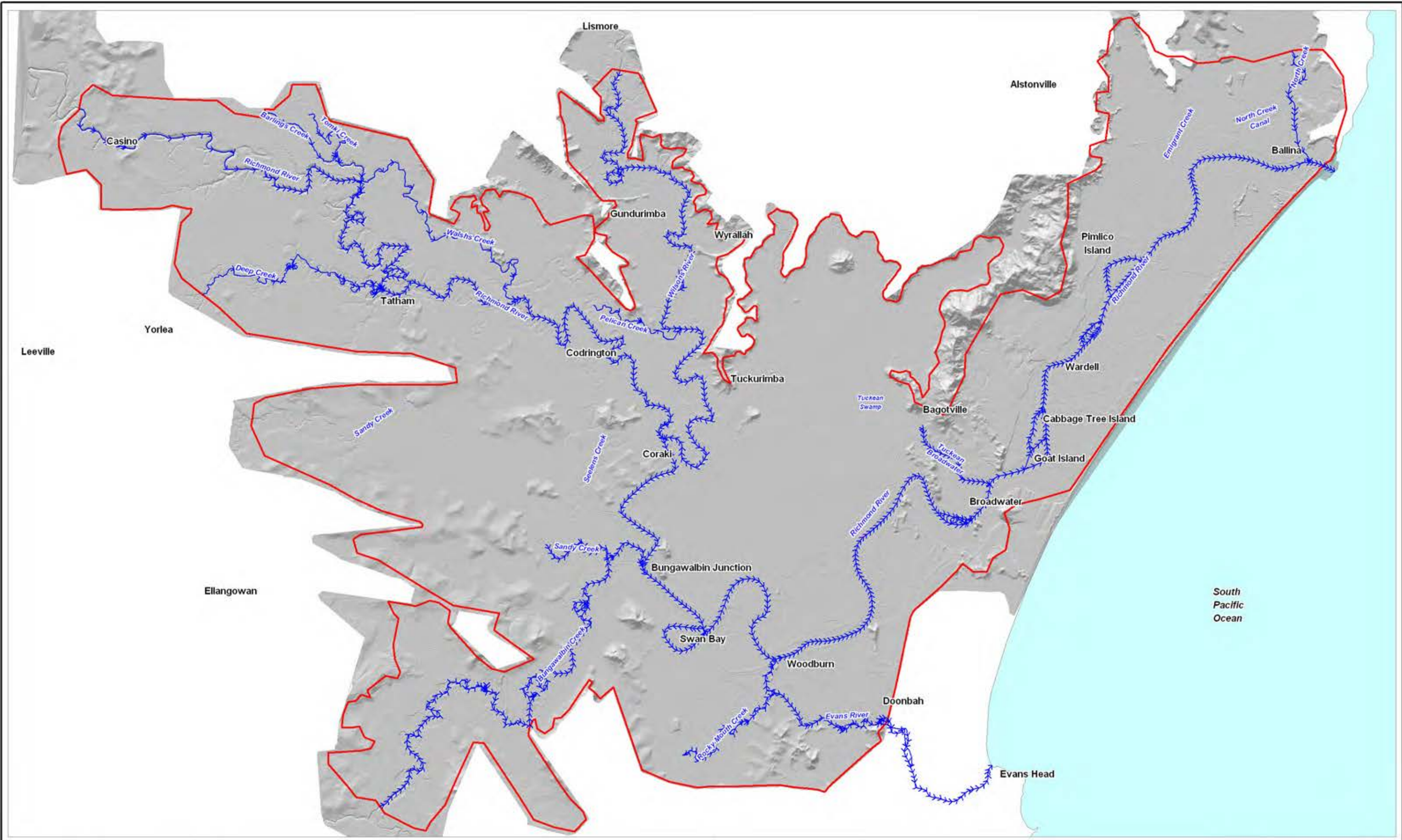
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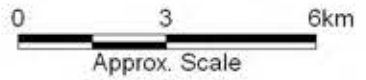
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- LEGEND**
-  2D Modelling Extent
 -  1D Network

Title:
1D/2D Model Extents

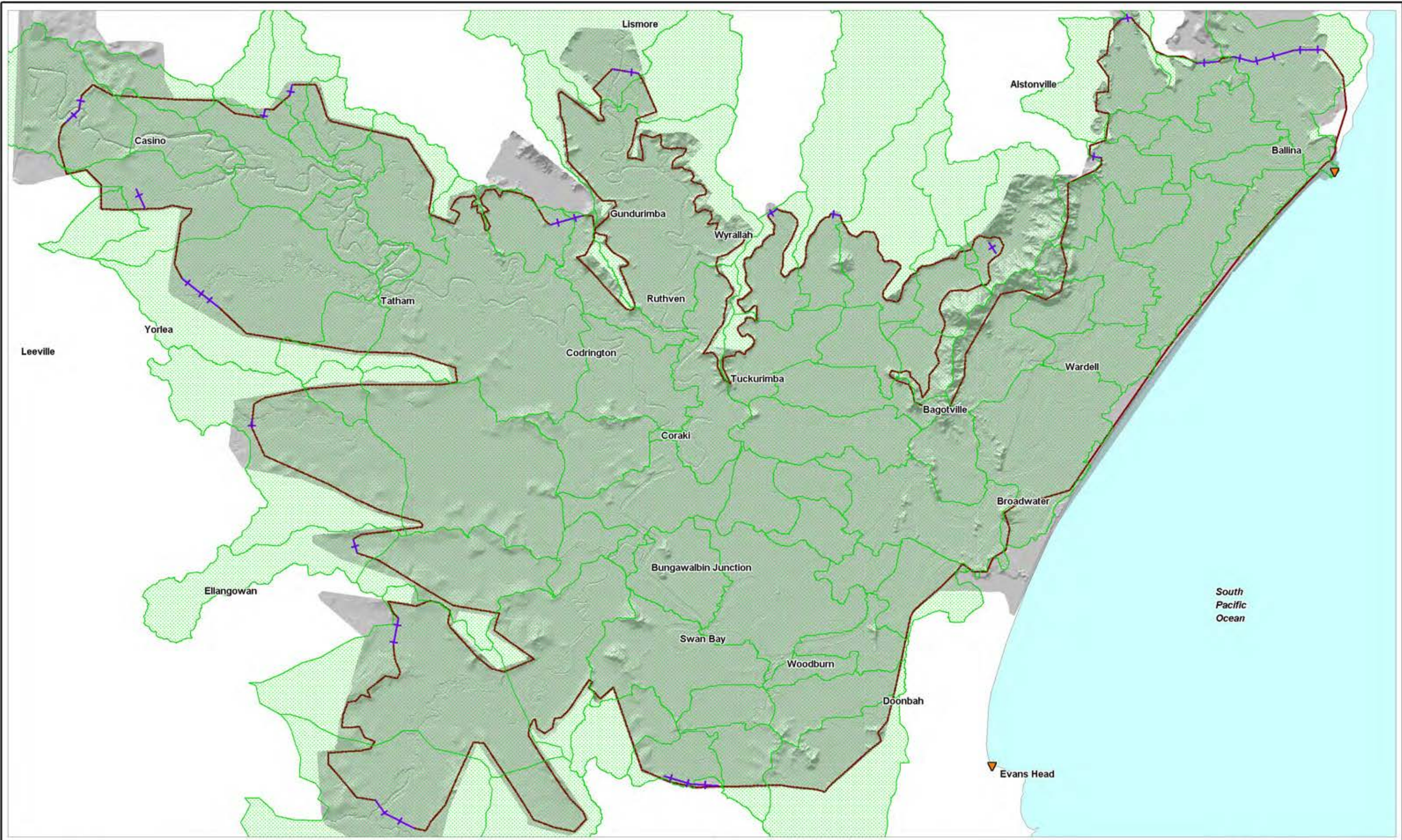
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Map:	Rev:
4-3	B



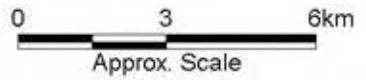
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- LEGEND**
-  2D Modelling Extent
 -  Rainfall Applied Directly to 2D Grid
 -  Inflow Boundary
 -  Ocean Boundary Conditions

Title:
Model Boundary Conditions

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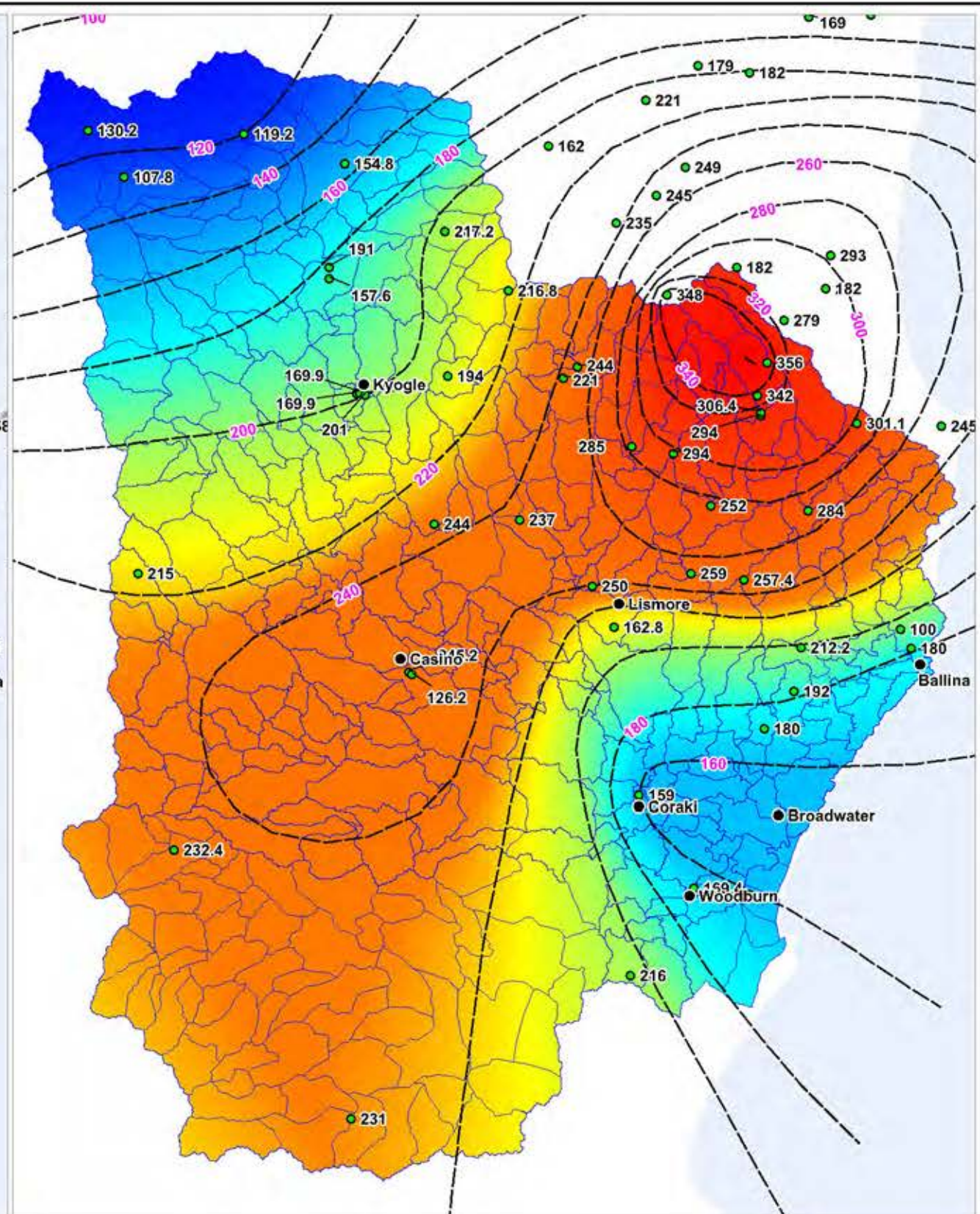
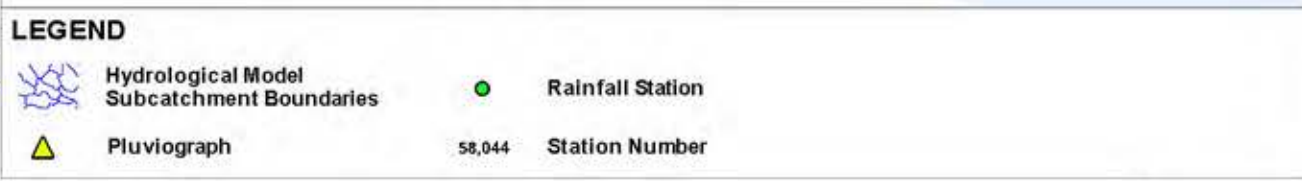
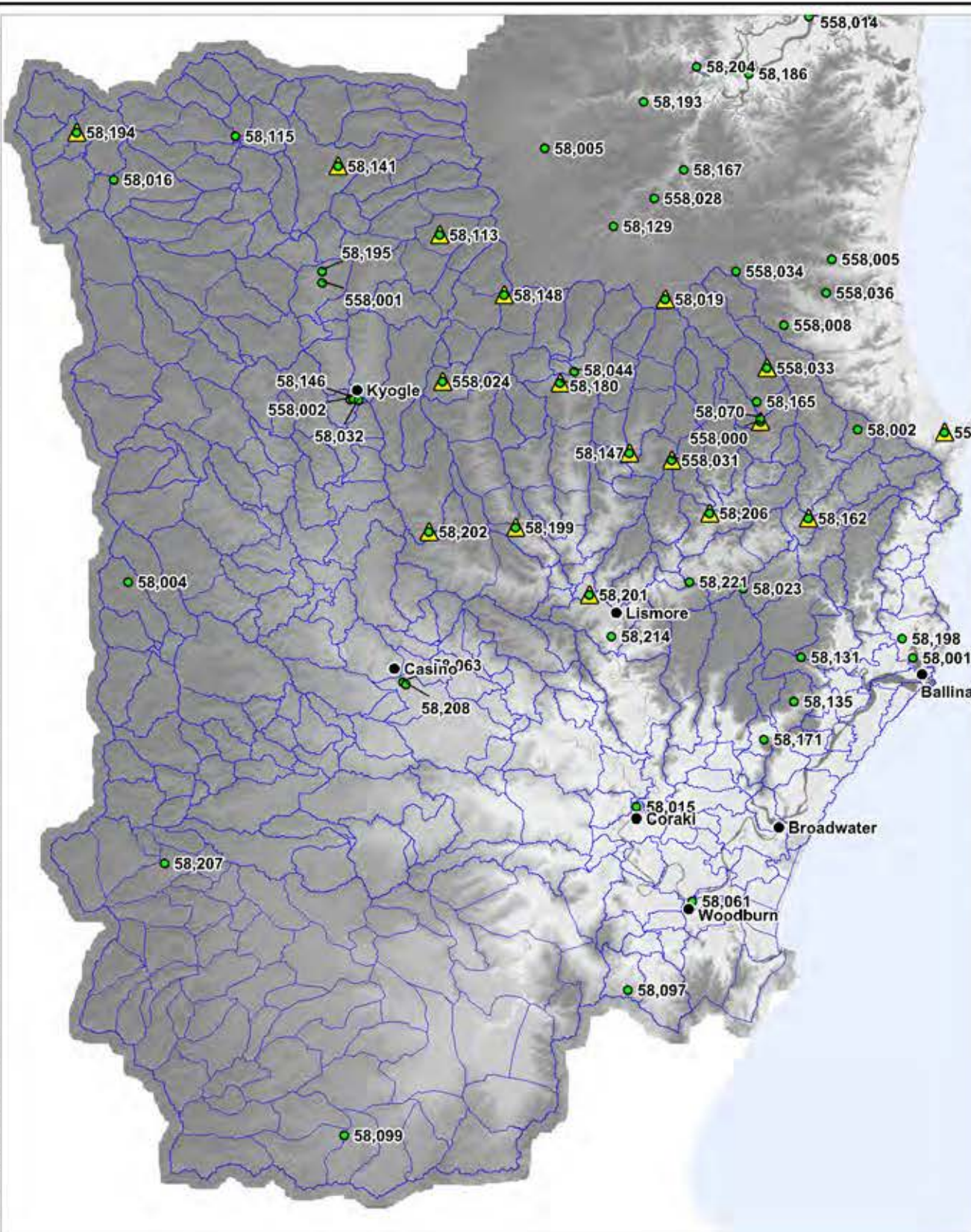


Map:	Rev:
4-4	A



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_038_091030 Model Boundary Conditions.wor

Station No.	Station Name
57,020	Urbenville Post Office
57,095	Tabulam (Muirie)
58,001	Ballina (Crowley Village)
58,002	Bangalow (Fowlers Lane)
58,004	Mummulgum (Bingebeebra)
58,005	Brays Ck (Misty Mountain)
58,015	Coraki Post Office
58,016	Unungar (Summerland Way)
58,019	Doon Doon (McCabes Rd)
58,023	McLeans Ridges (Lascott Drive)
58,032	Kyogle Post Office
58,044	Nimbin Post Office
58,061	Woodburn Post Office
58,063	Casino Airport
58,068	Lawrence Rd (Pringles Way)
58,070	Repentance Ck
58,097	New Italy
58,099	Whiporie Post Office
58,113	Green Pigeon (Morning View)
58,115	Grevilla (Lindesay View)
58,129	Kunghur (The Junction)
58,131	Aistonville Tropical Fruit Research
58,135	Meerscham Vale (Barden)
58,141	Loadstone (High View)
58,146	Kyogle (Larkin Street)
58,147	The Channon
58,148	Lillian Rock (Williams Rd)
58,162	Nashua (Wilson's River)
58,165	Upper Coopers Ck
58,167	Uki (Tweed River)
58,171	Meerscham Vale (Jenbetdaph)
58,180	Nimbin (Goolmangar Ck)
58,186	Murwillumbah (Tweed River)
58,193	Eungella (Oxley River)
58,194	Dairy Flat
58,195	Wiangaree Post Office
58,198	Ballina Airport AWS
58,199	Rock Valley (Leycester Ck)
58,201	Tuncester (Leycester Ck)
58,202	Bentley (Back Ck)
58,204	Boat Harbour (Rous River)
58,206	Ewing Br Corndale (Coopers Ck)
58,207	Busbys Flat
58,208	Casino Airport AWS
58,214	Lismore Airport AWS
58,221	Lismore (Richmond Hill)
558,000	Repentance (Coopers Ck)
558,001	Wiangaree Br (Richmond River)
558,002	Kyogle (Richmond River)
558,005	Lacks Ck (Middle Pocket)
558,008	Mullumbimby Creek
558,011	Tweed Heads (Duranbah Alert Re)
558,014	Tumbulgum (Tweed River)
558,024	Cawongla (Alert)
558,025	Mullumbimby (Chincogan Repeats)
558,028	Clarrie Hall Dam (Doon Doon Ck)
558,031	Dunoon Alert Repeater
558,033	Goonengerry (Alert)
558,034	Mullumbimby (Upper Main Arm)
558,036	Myocum
558,066	Belongil Ck

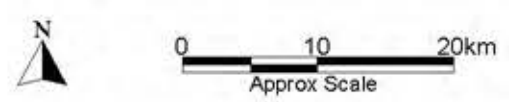


Notes:
 1. Total rainfall is recorded for between 09:00 20 May and 09:00 22 May 2009.

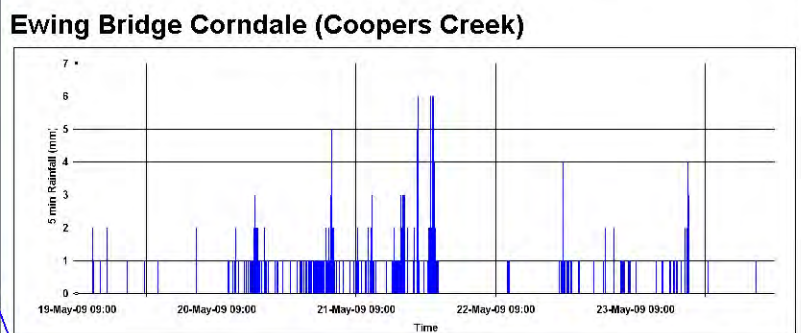
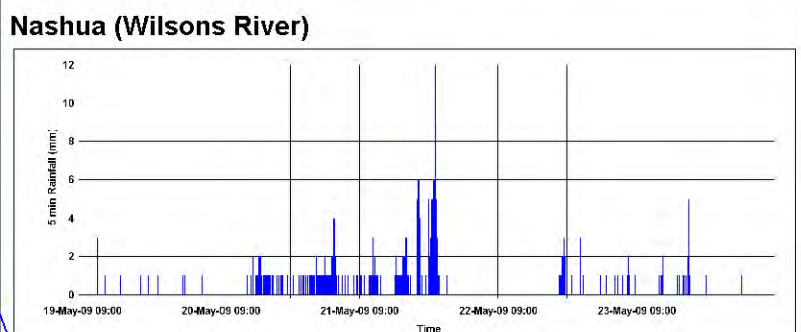
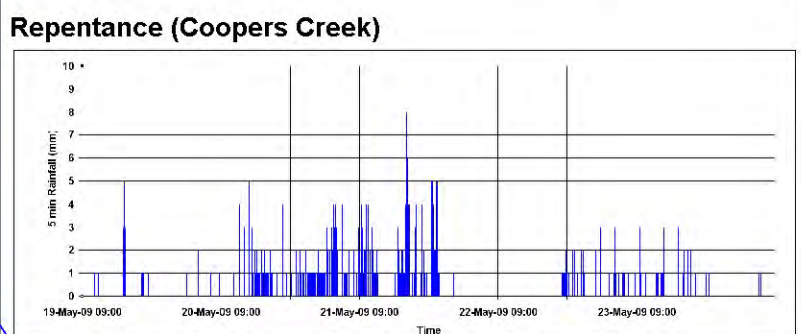
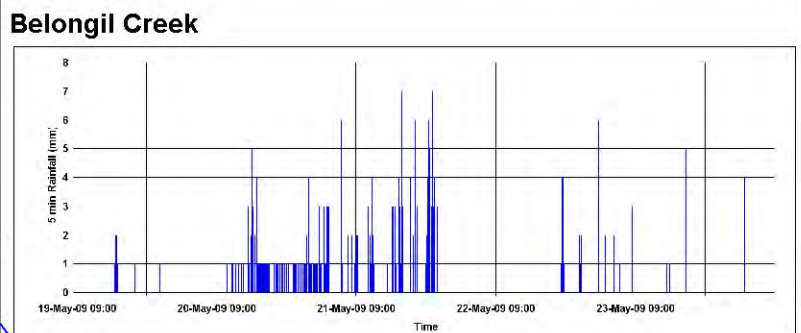
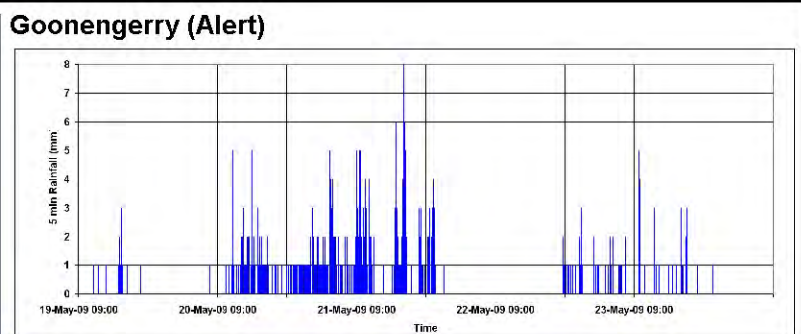
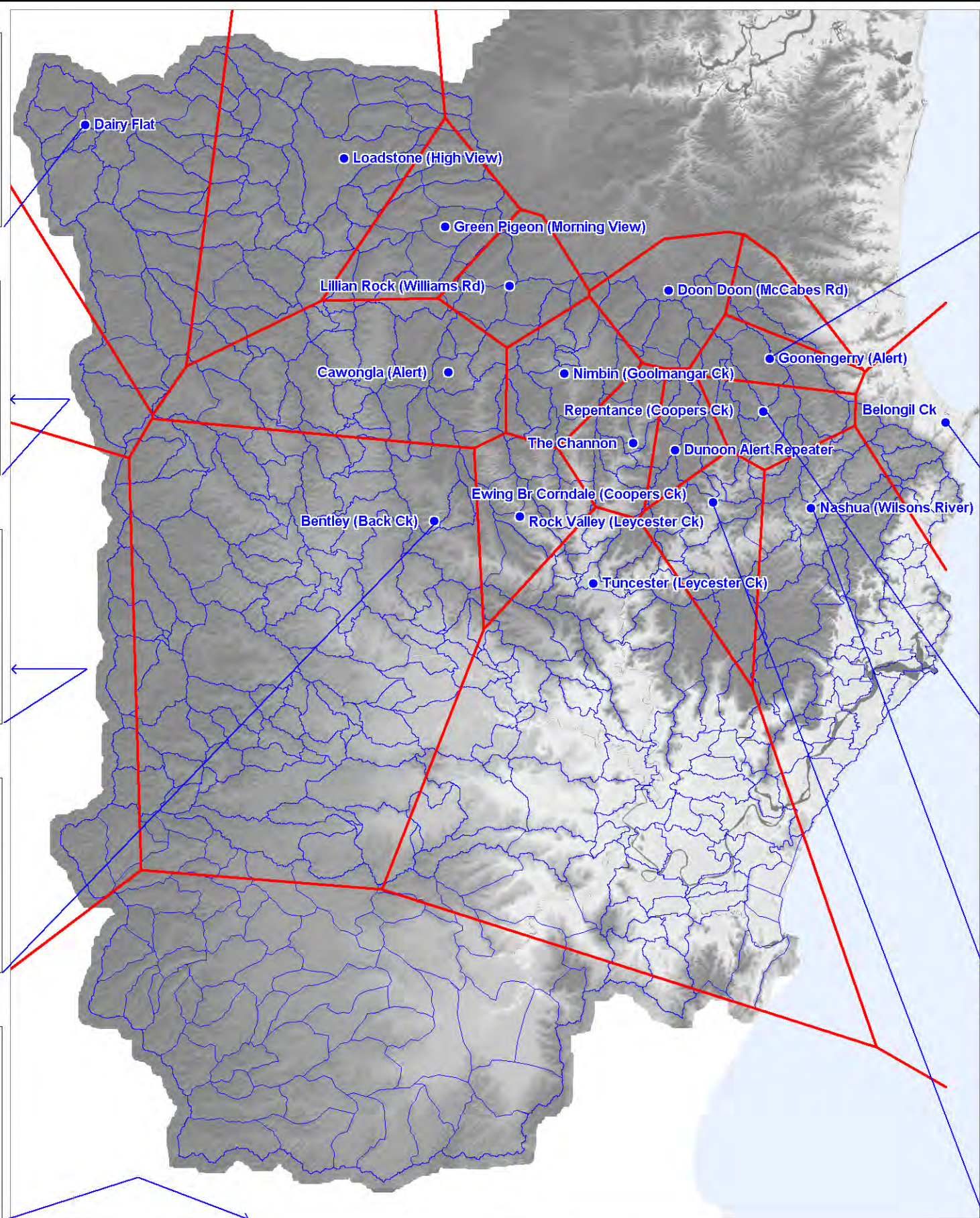
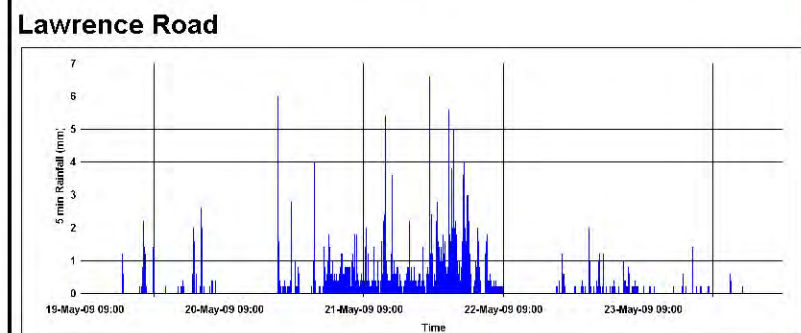
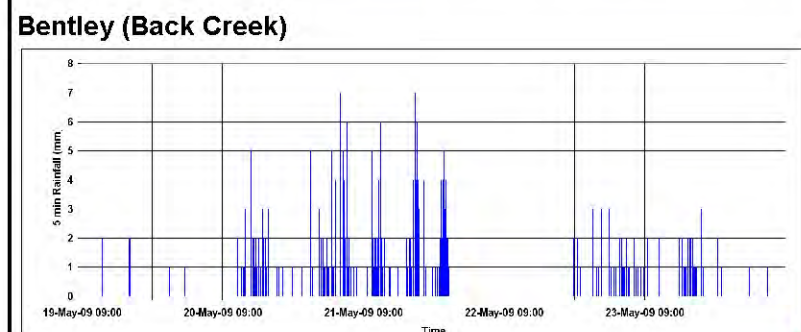
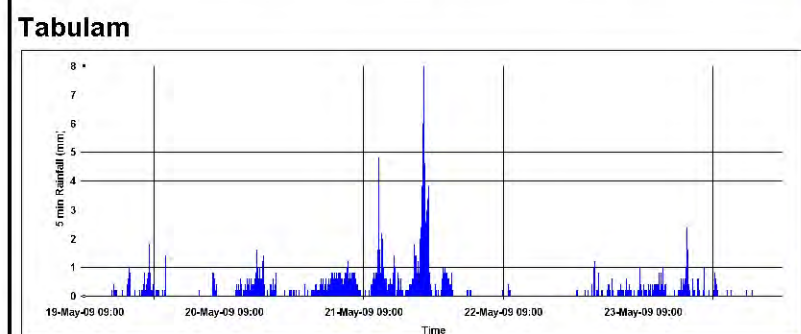
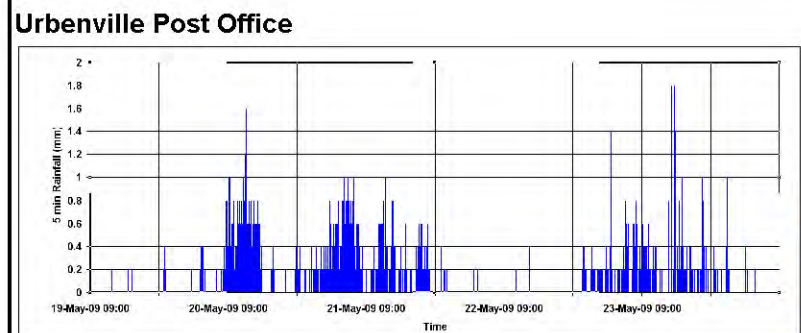
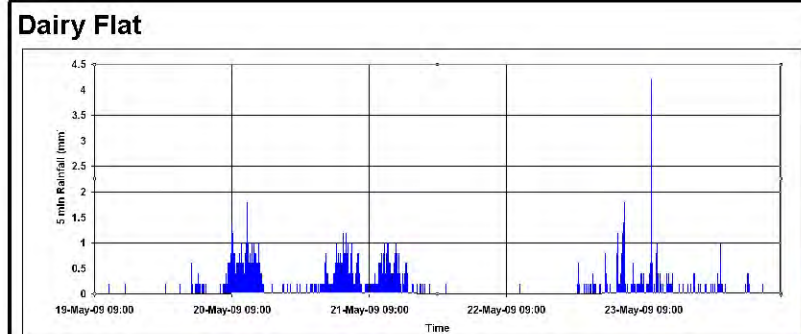
Title: **May 2009 Event Gauge Locations and Areal Rainfall**

Map: **5-1** Rev: **A**

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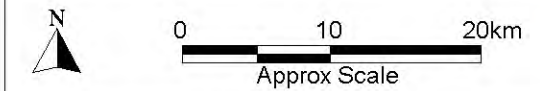
Filepath: I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_031_091027 May 2009 Rainfall Gauges.WOR



- LEGEND**
- Hydrological Model Subcatchment Boundaries
 - Rainfall Station
 - Theissen Rainfall Distribution

Title:
**May 2009 Event
 Pluviograph Distribution - Sheet 1 of 2**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



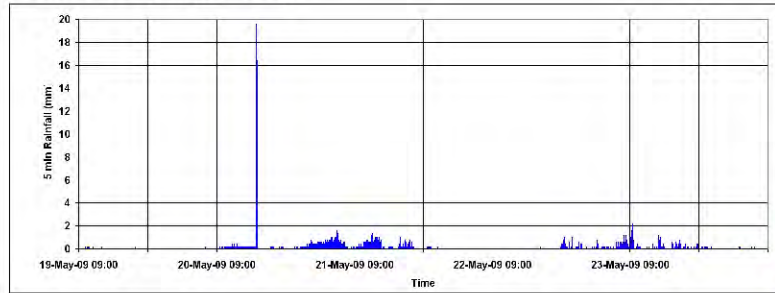
Map:
5-2

Rev:
A

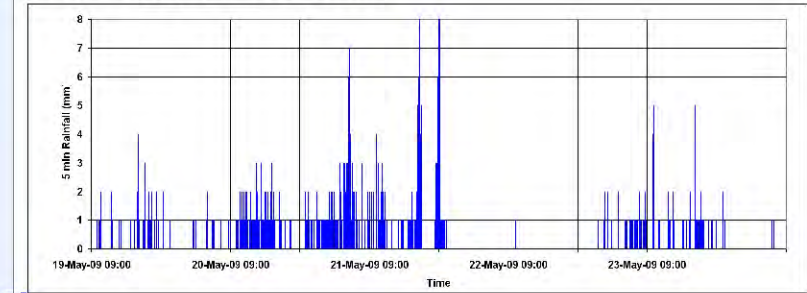


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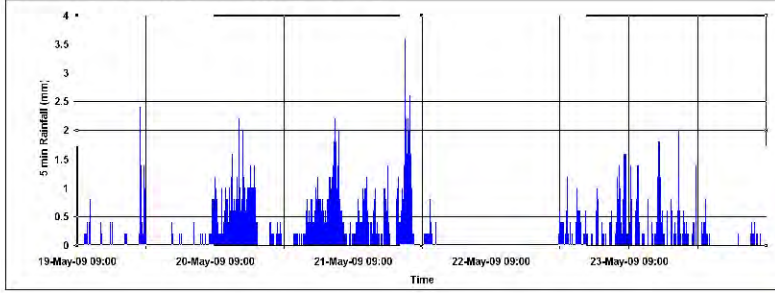
Loadstone (High View)



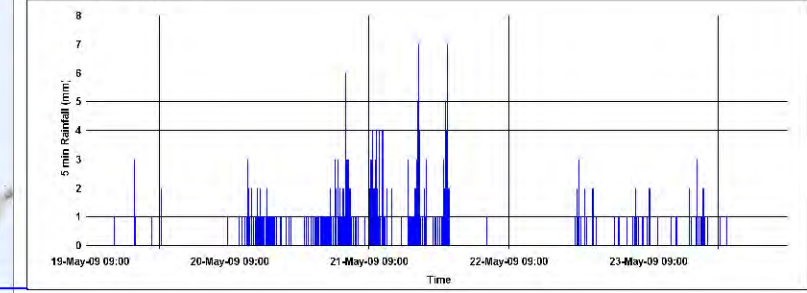
Doon Doon (McCabes Road)



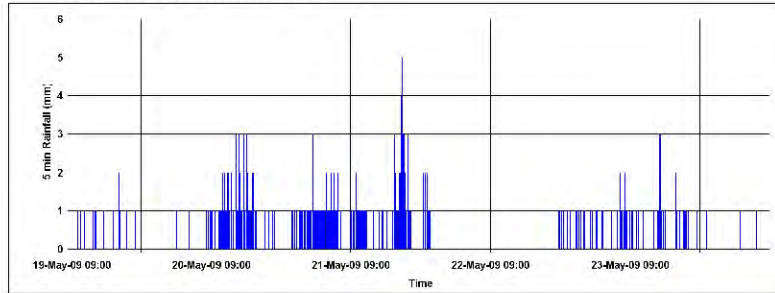
Green Pigeon (Morning View)



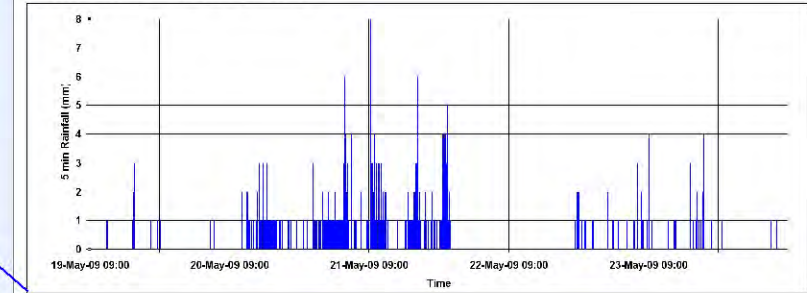
The Channon



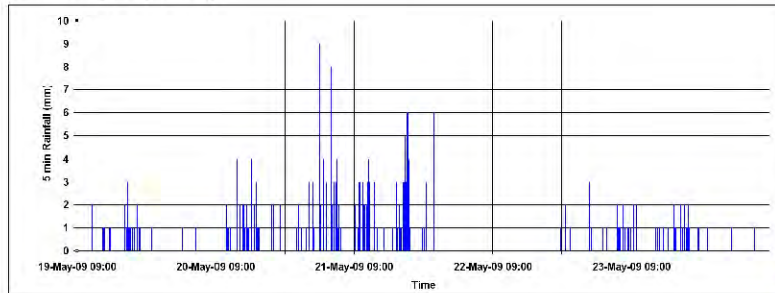
Lillian Rock (Williams Road)



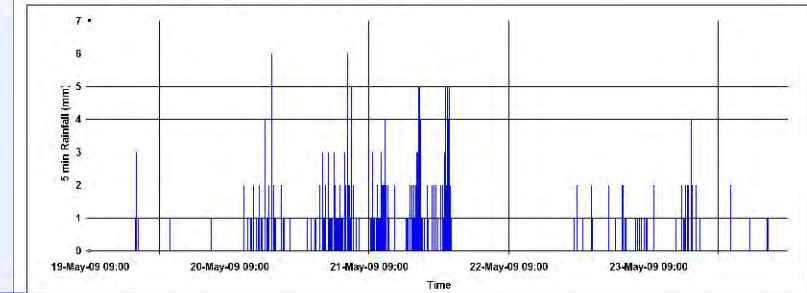
Dunoon Alert Repeater



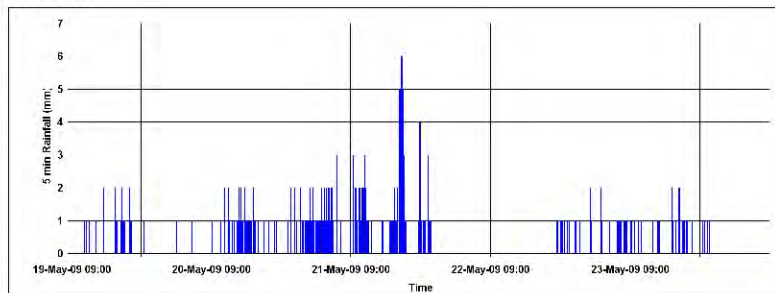
Cawongla (Alert)



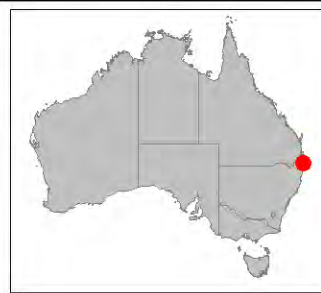
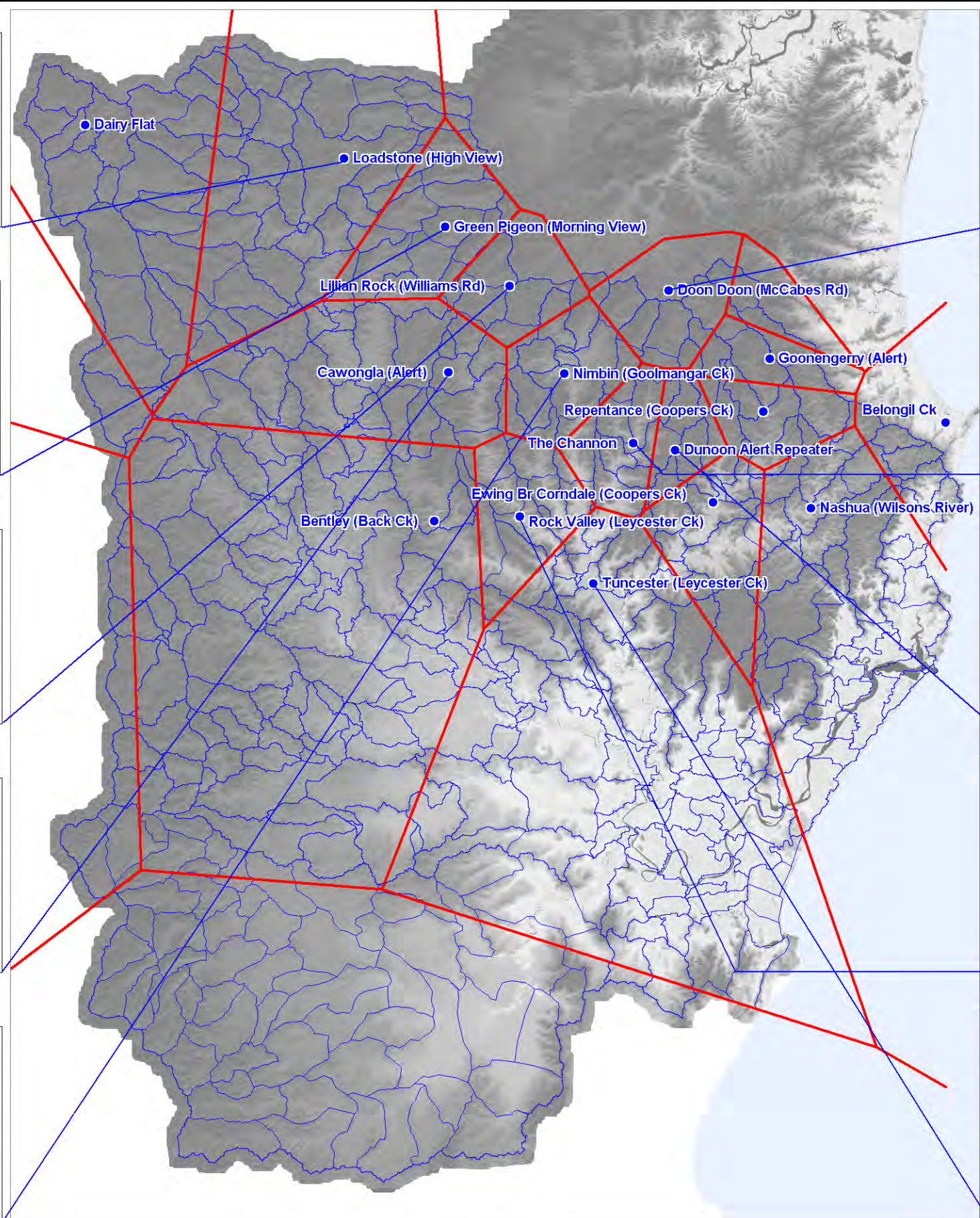
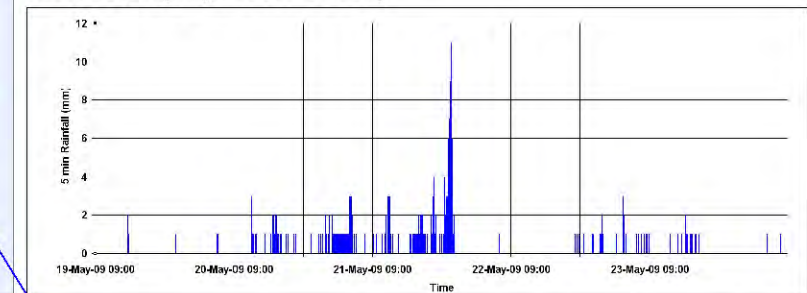
Rock Valley (Leycester Creek)






Nimbin



Tuncester (Leycester Creek)

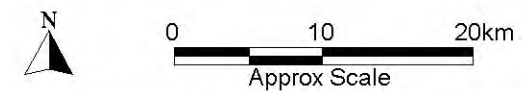


LEGEND

-  Hydrological Model Subcatchment Boundaries
-  Rainfall Station
-  Theissen Rainfall Distribution

Title:
**May 2009 Event
 Pluviograph Distribution - Sheet 2 of 2**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

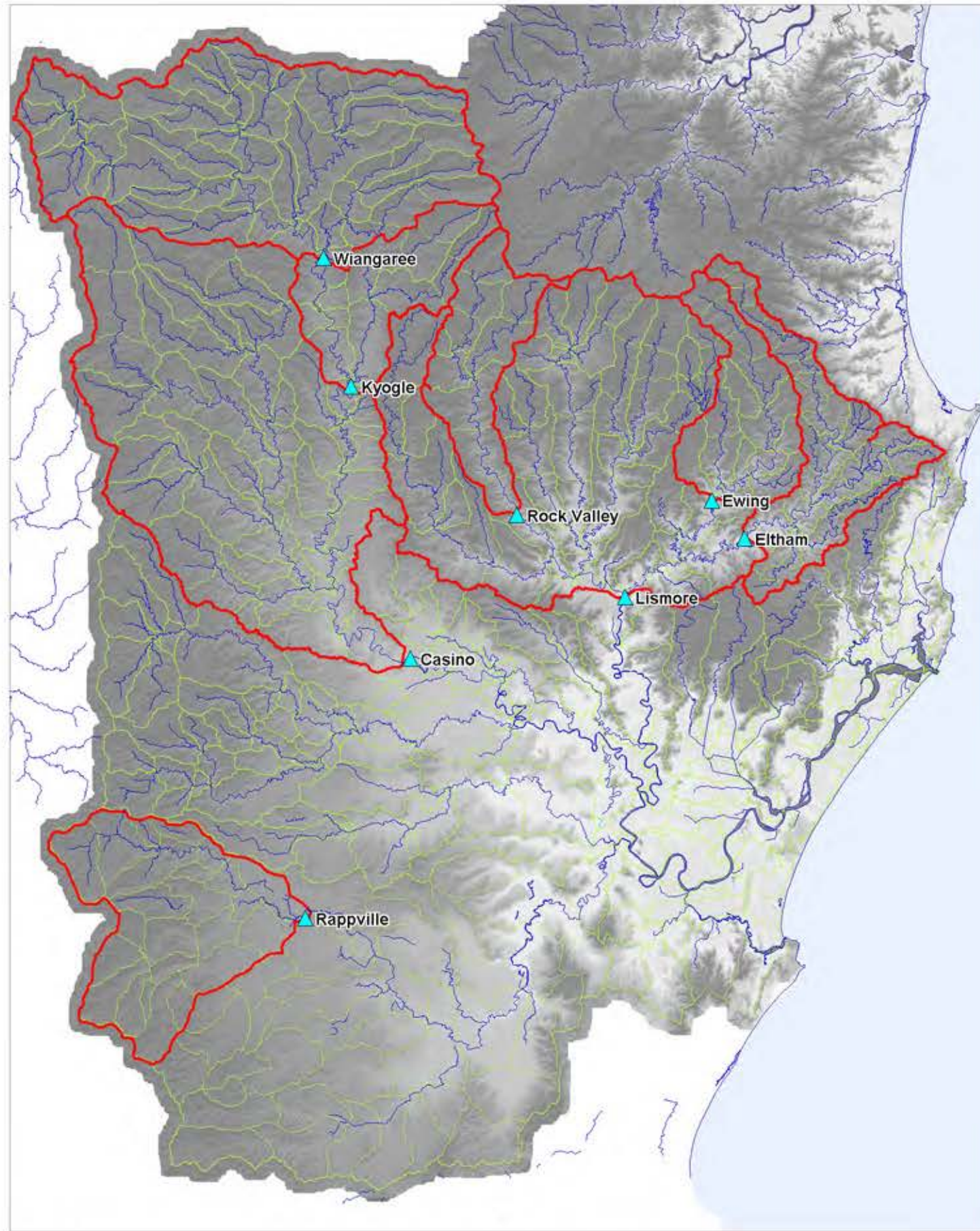


Map:
5-3

Rev:
A



Station_No	Station_Name
203,004	Casino
203,014	Eltham
203,900	Kyogle
203,904	Lismore
203,005	Wiangaree
203,905	Rappville
203,024	Ewing
203,010	Rock Valley



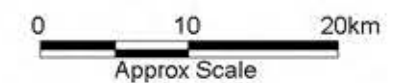
LEGEND

- Sub-catchment Boundaries
- Gauge Catchment Boundaries
- ▲ Stream Flow Gauge Station

Title:

**May 2009 Event
Stream Gauge Locations - Hydrology**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



Map:
5-4

Rev:
A



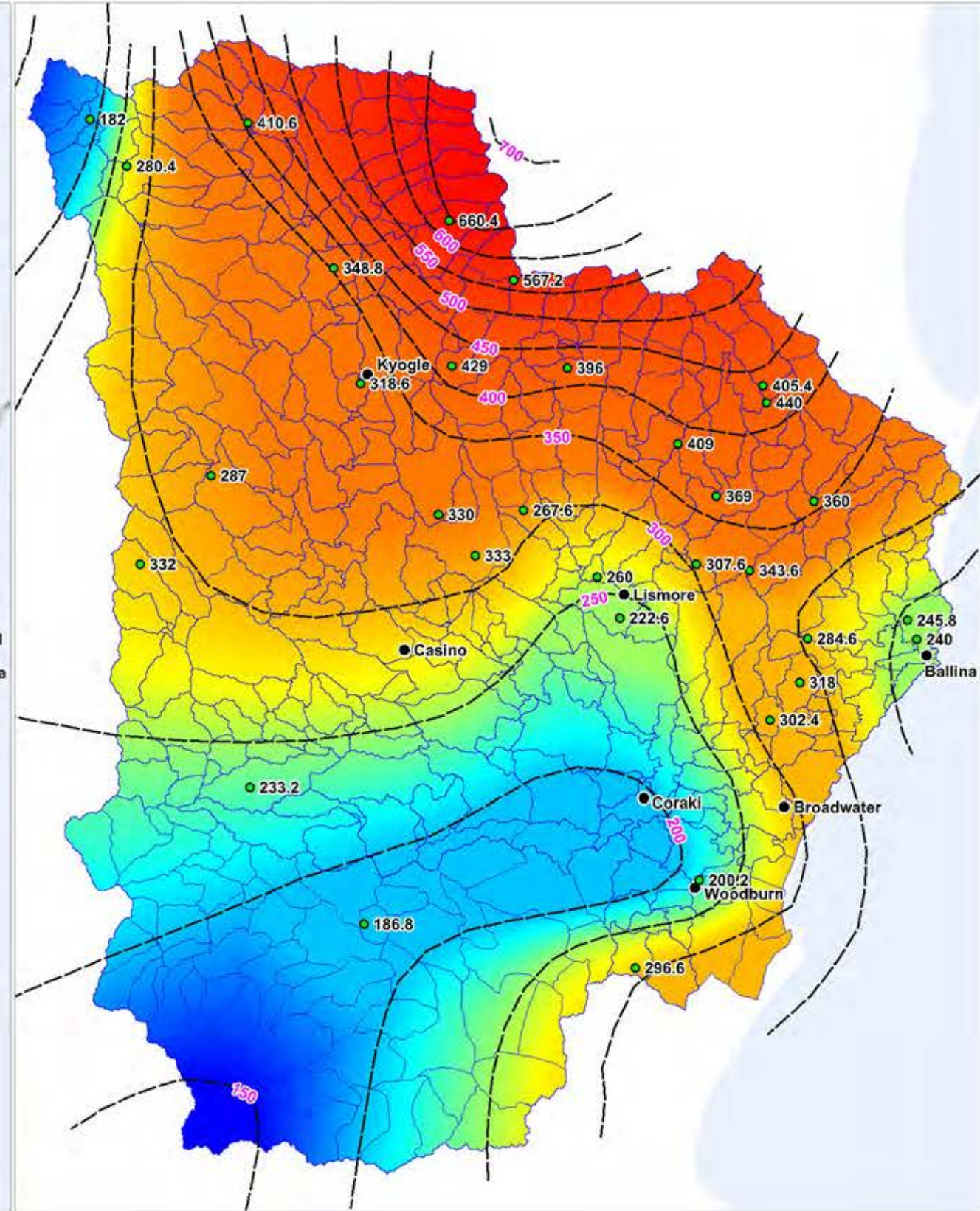
Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_053_091110_Gauges_2009.WOR

Station No.	Station Name
58,001	Ballina (Crowley Village)
58,004	Mummulgum (Bingeebebra)
58,016	Unungar (Summerland Way)
58,023	McLeans Ridges (Lascott Drive)
58,061	Woodburn Post Office
58,070	Repentance Ck
58,078	Bentley
58,097	New Italy
58,113	Green Pigeon (Morning View)
58,115	Grevilla (Lindsey View)
58,131	Alstonville Tropical Fruit Research
58,135	Meerschaum Vale (Barden)
58,148	Lillian Rock (Williams Rd)
58,162	Nashua (Wilson's River)
58,185	Upper Coopers Ck
58,171	Meerschaum Vale (Jenbetdaph)
58,180	Nimbin (Goolmangar Ck)
58,192	Upper Mongogarie (Marangaroo)
58,194	Dairy Flat
58,198	Ballina Airport AWS
58,199	Rock Valley (Leicester Ck)
58,201	Tuncester (Leicester Ck)
58,202	Bentley (Back Ck)
58,206	Ewing Br Comdale (Coopers Ck)
58,214	Lismore Airport AWS
58,220	Woolners Arm
58,221	Lismore (Richmond Hill)
203,030	Myrtle Ck @Rappville
204,002	Clarence R @Tabulam
204,007	Clarence R @Lilydale (Newbold C)
204,900	Clarence R @Baryulgil
558,001	Wiangaree Br (Richmond River)
558,002	Kyogle (Richmond River)
558,024	Cawongla (Alert)
558,031	Dunoon Alert Repeater



LEGEND

- Hydrological Model Subcatchment Boundaries
- Rainfall Station
- Pluviograph
- 58,044 Station Number



LEGEND

- Hydrological Model Subcatchment Boundaries
- Rainfall Station
- Isohyets
- 232.4 Total Rainfall (mm)



Notes:
 1. Total rainfall is recorded for between 09:00 30 December and 09:00 7 January 2008.

Title:
**January 2008 Event
 Gauge Locations and Areal Rainfall**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

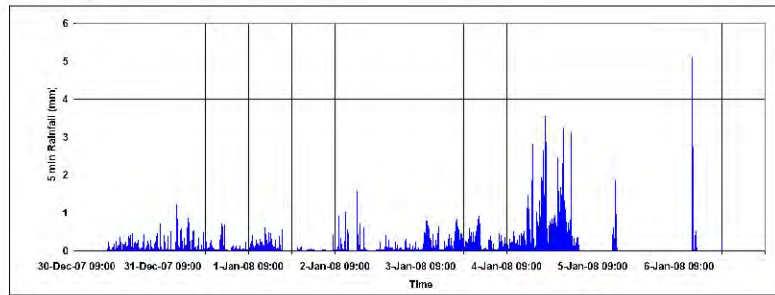


Map:
5-5

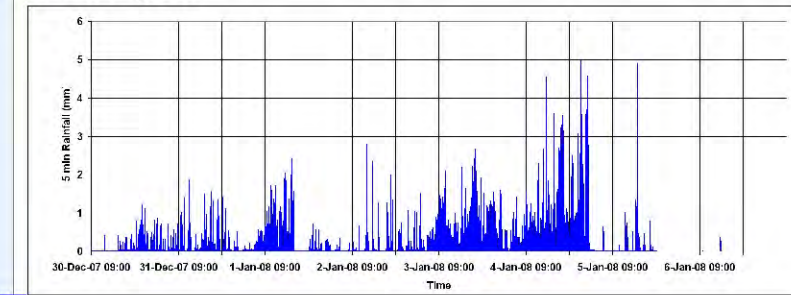
Rev.
A



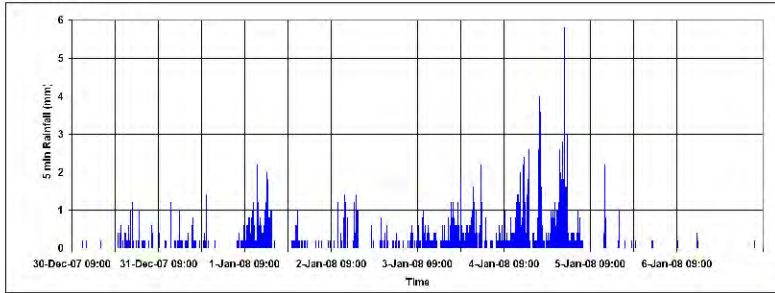
Unumgar



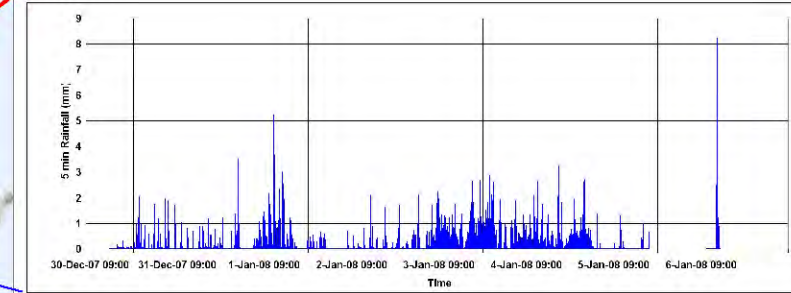
Green Pigeon



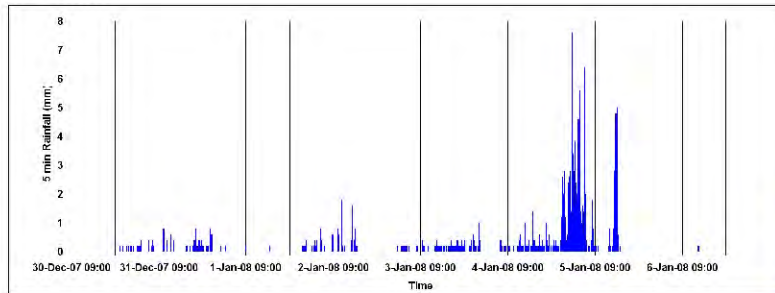
Wiangaree



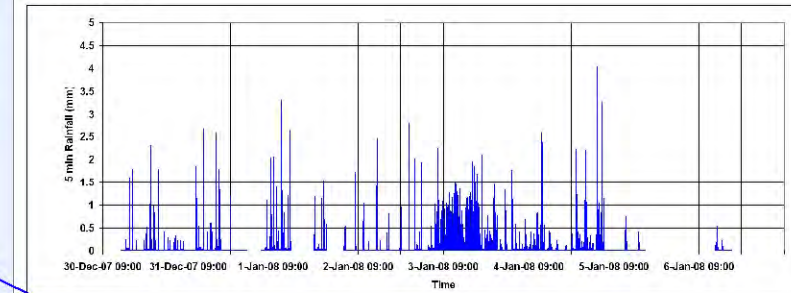
Nimbin



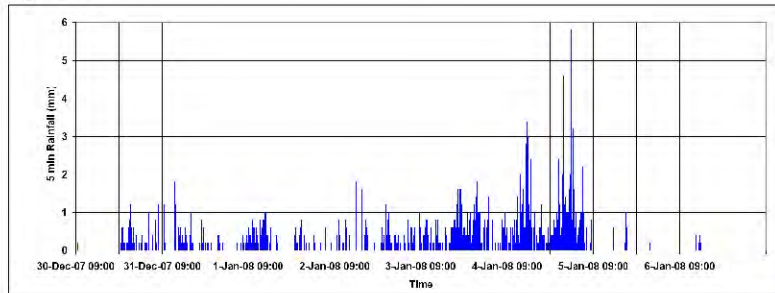
Tabulam



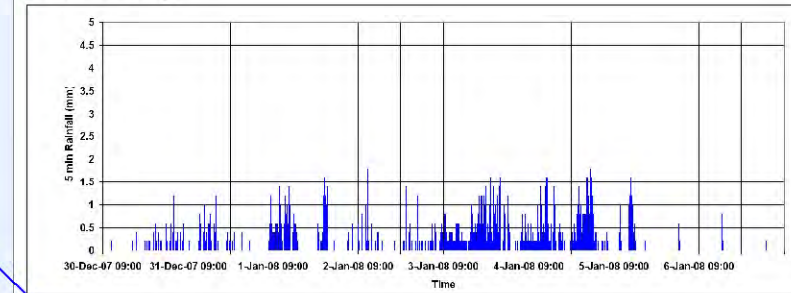
Alstonville



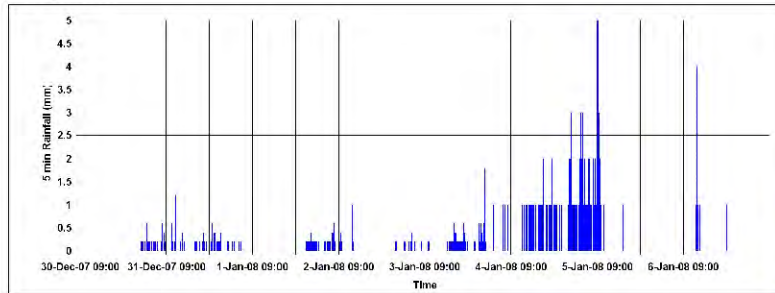
Kyogle



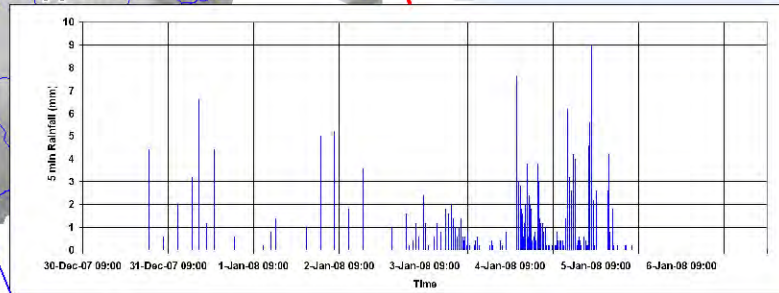
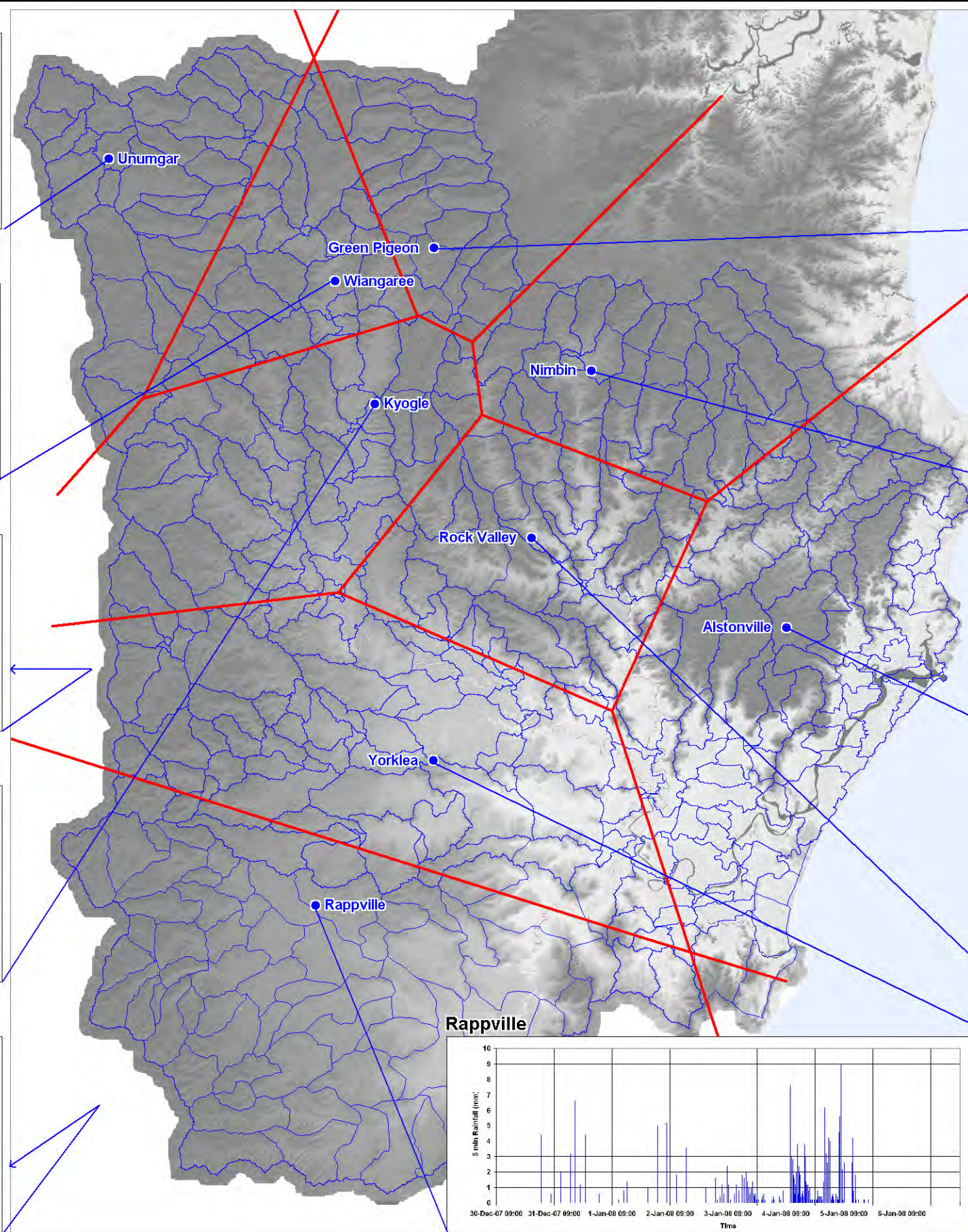
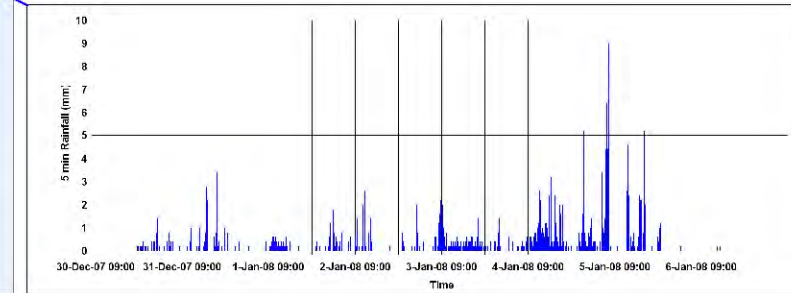
Rock Valley






Baryulgil



Yorklea

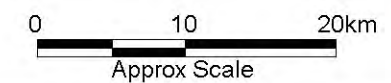


LEGEND

-  Hydrological Model Subcatchment Boundaries
-  Rainfall Station
-  Thiessen Rainfall Distribution

Title:
**January 2008 Event
Pluviograph Distribution**

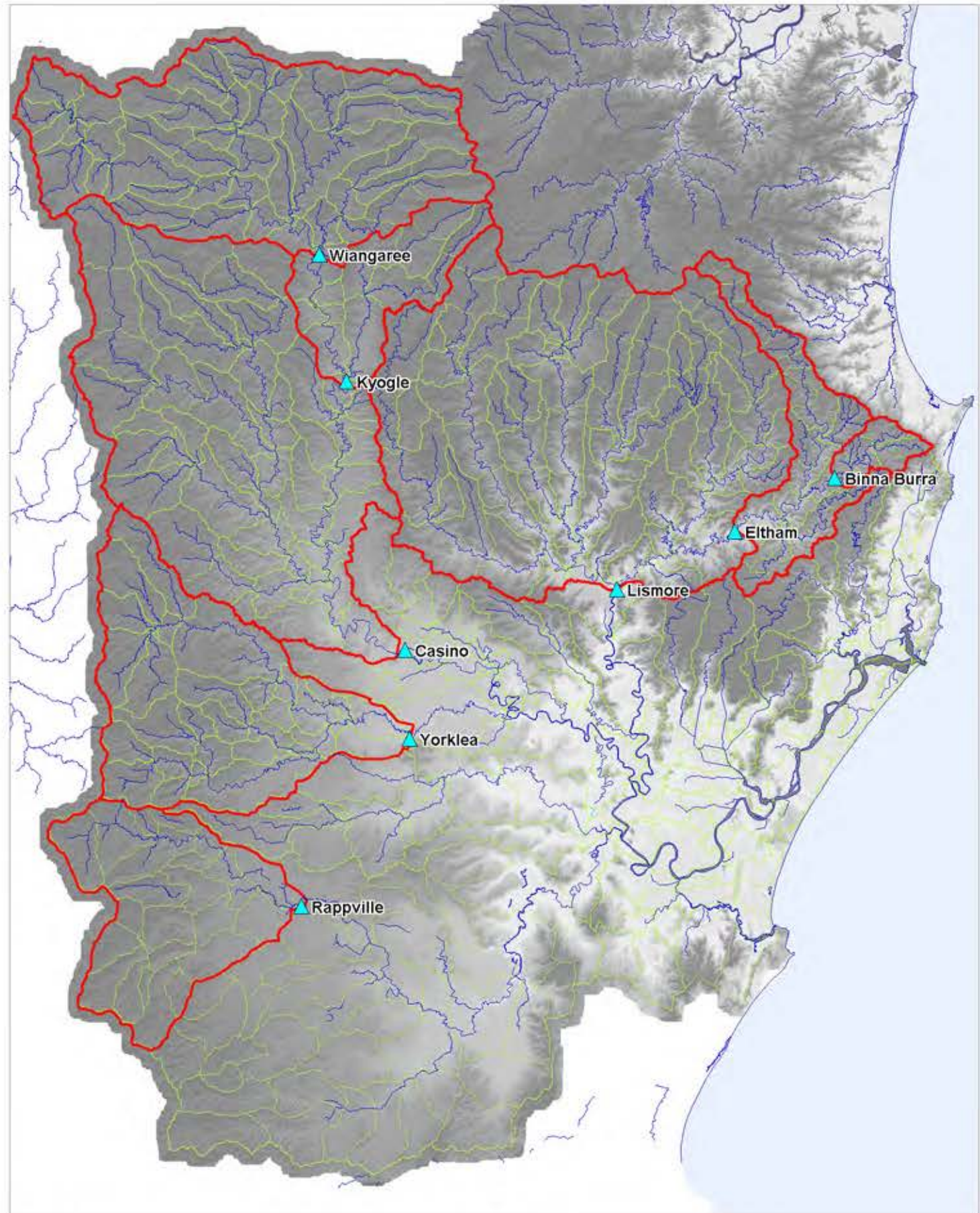
BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



Map: **5-6** Rev: **A**



Station_No	Station_Name
203,004	Casino
203,014	Eltham
203,900	Kyogle
203,904	Lismore
203,005	Wiangaree
203,041	Yorklea
203,012	Binna Burra
203,905	Rappville

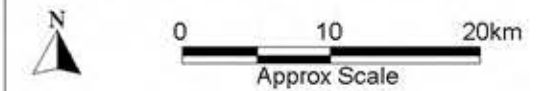


LEGEND

- Sub-catchment Boundaries
- Gauge Catchment Boundaries
- ▲ Stream Flow Gauge Station

Title:
**January 2008 Event
 Stream Gauge Locations - Hydrology**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

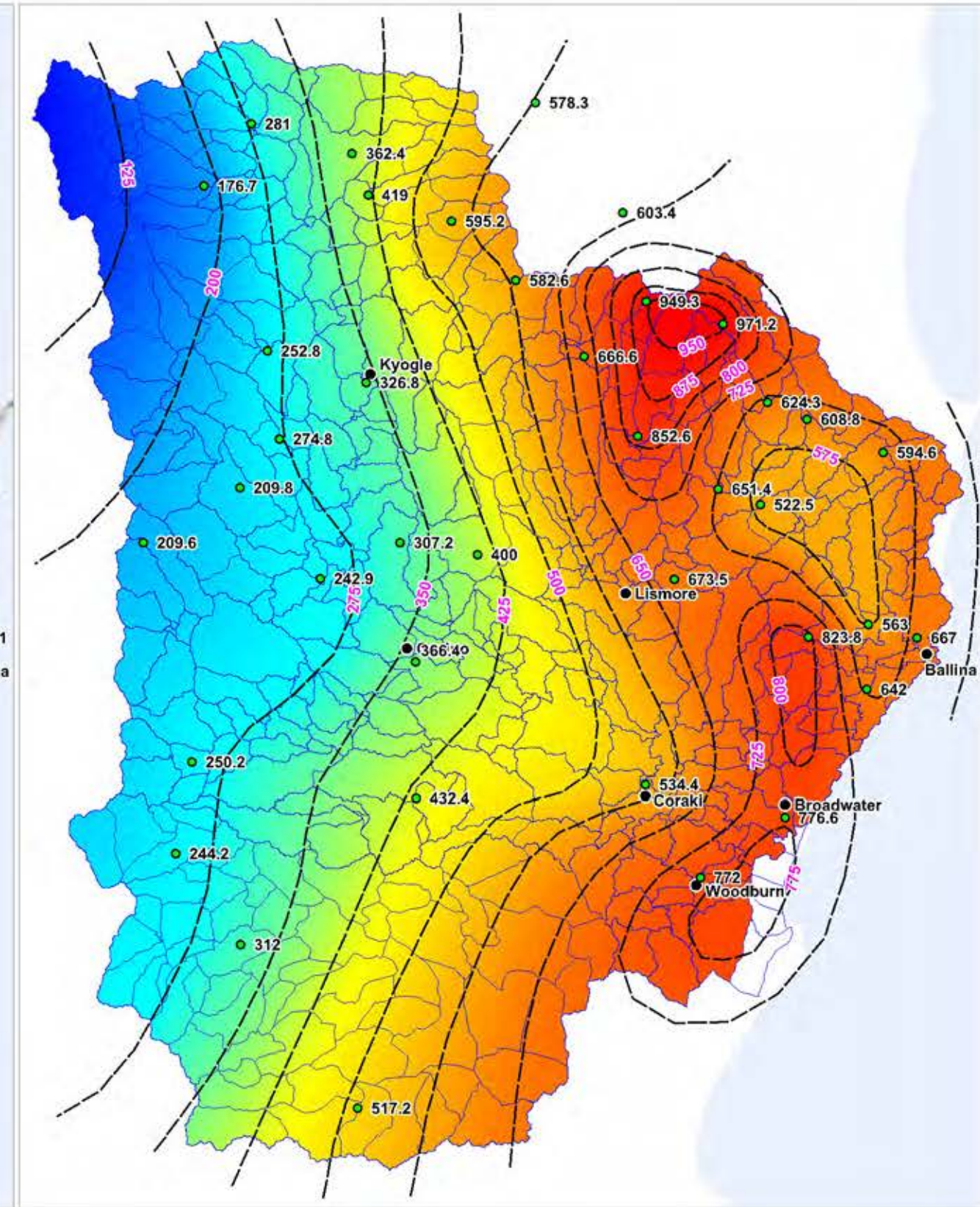
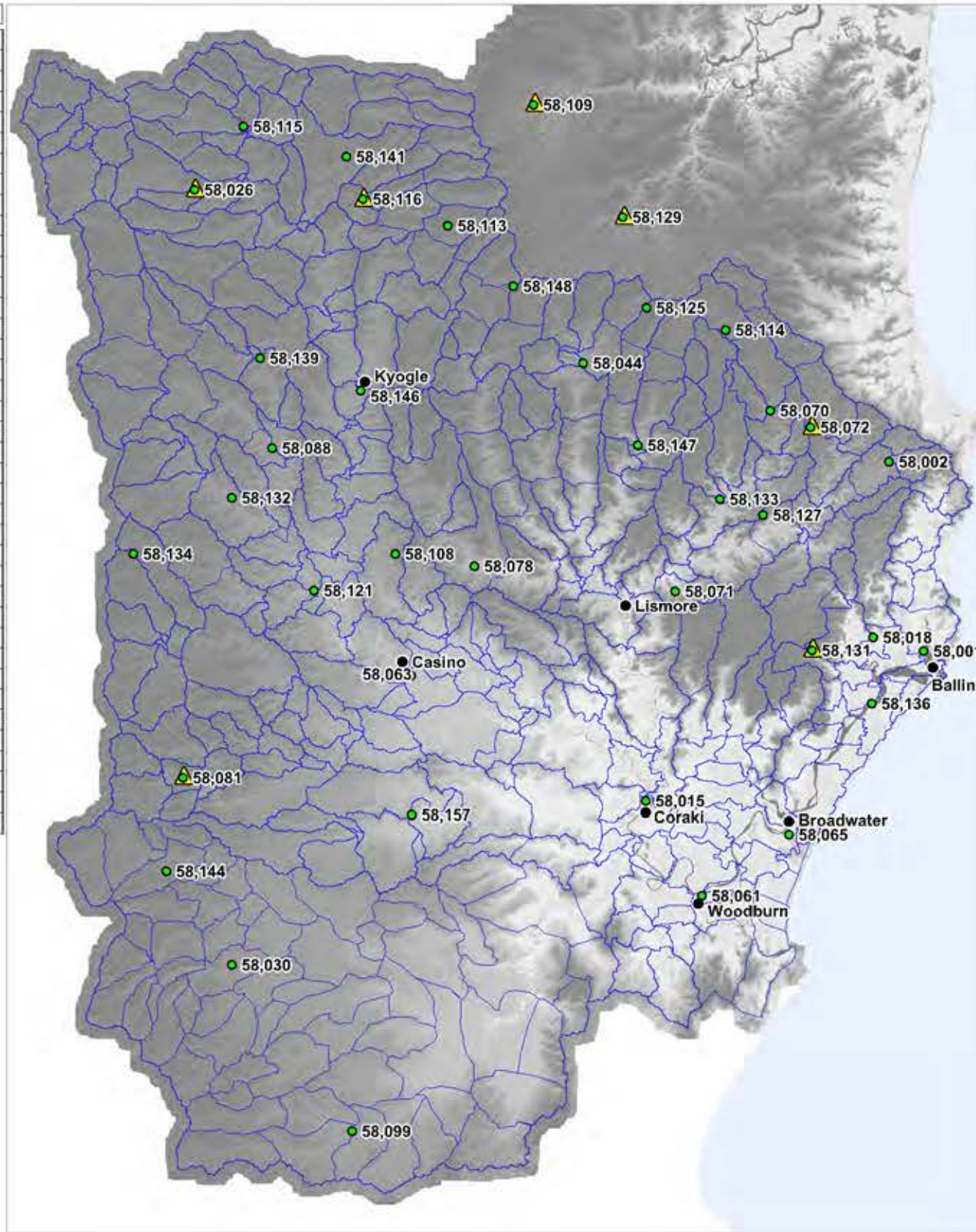


Map:	Rev:
5-7	A



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_055_091110_Gauges_2008.WOR

Station No.	Station Name
58,001	Ballina (Crowley Village)
58,002	Bangalow Motel
58,015	Coraki Post Office
58,018	Fairview
58,026	Grevillia (Summerland Way)
58,030	Kippenduff
58,044	Nimbin Post Office
58,061	Woodburn Post Office
58,063	Casino Airport
58,065	Broadwater Sugar Mill
58,070	Repentance Ck
58,071	Goonellebah
58,072	Federal Post Office
58,078	Bentley
58,081	Kimberley
58,088	Etnock (Carara)
58,099	Whiporie Post Office
58,106	Green Gates
58,109	Tyalgum (Pumpenbil Rd)
58,113	Green Pigeon (Morning View)
58,114	Mullumbimby
58,115	Grevillia (Lindsey View)
58,116	Warrazamble Rd
58,121	Stratheden
58,125	Mount Nardi
58,127	Clunes (Main Rd)
58,129	Kunghur (The Junction)
58,131	Alstonville Tropical Fruit Research
58,132	Dyraaba Central
58,133	Comdale (Willow Vale)
58,134	Roseview
58,136	Amaroo
58,139	Karingal
58,141	Loadstone (High View)
58,144	Busby Flat
58,146	Kyogle (Larkin Street)
58,147	The Channon
58,148	Lillian Rock (Williams Rd)
58,157	Eaglehawk



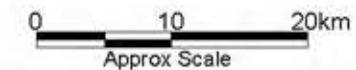
Notes:

1. Total rainfall is recorded for between 09:00 9 March and 09:00 14 March 1974.

Title:

**March 1974 Event
Gauge Locations and Areal Rainfall**

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



Map:

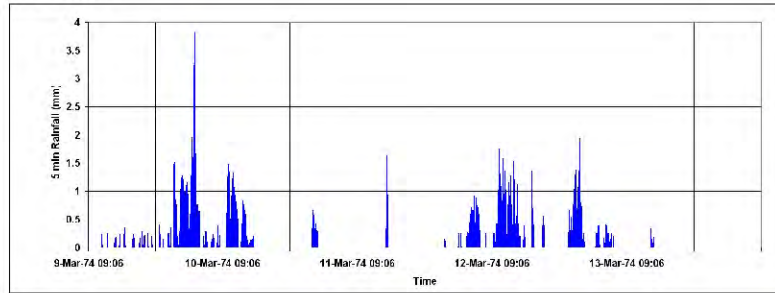
5-8

Rev:

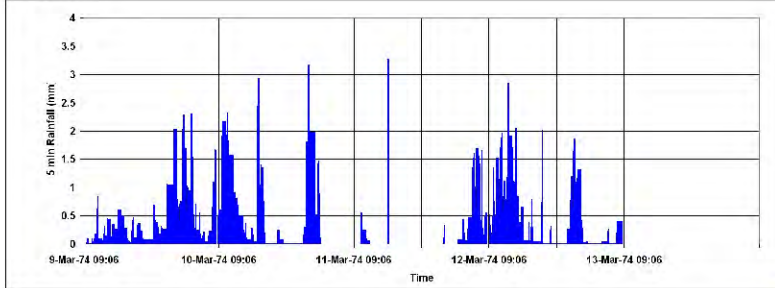
A



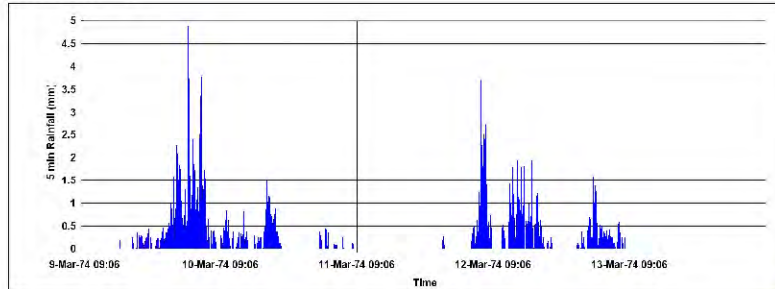
Grevillia



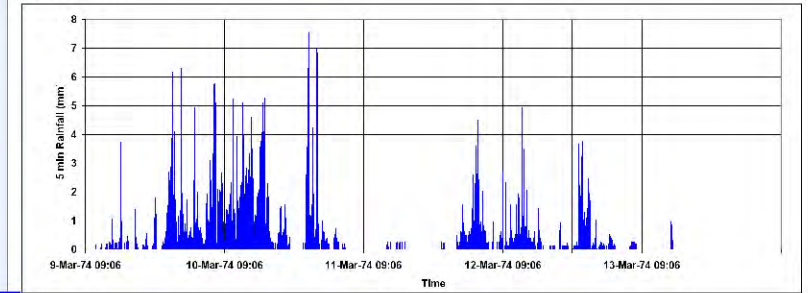
Lynchs



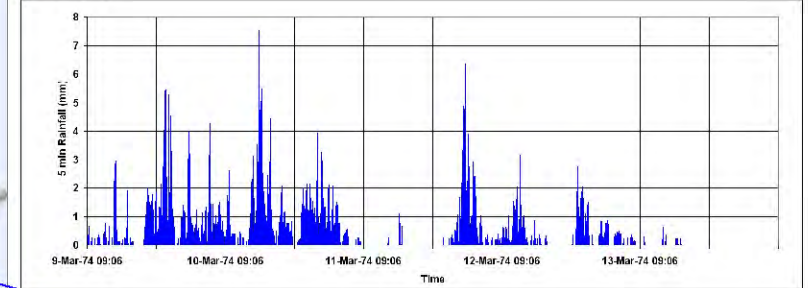
Kimberley



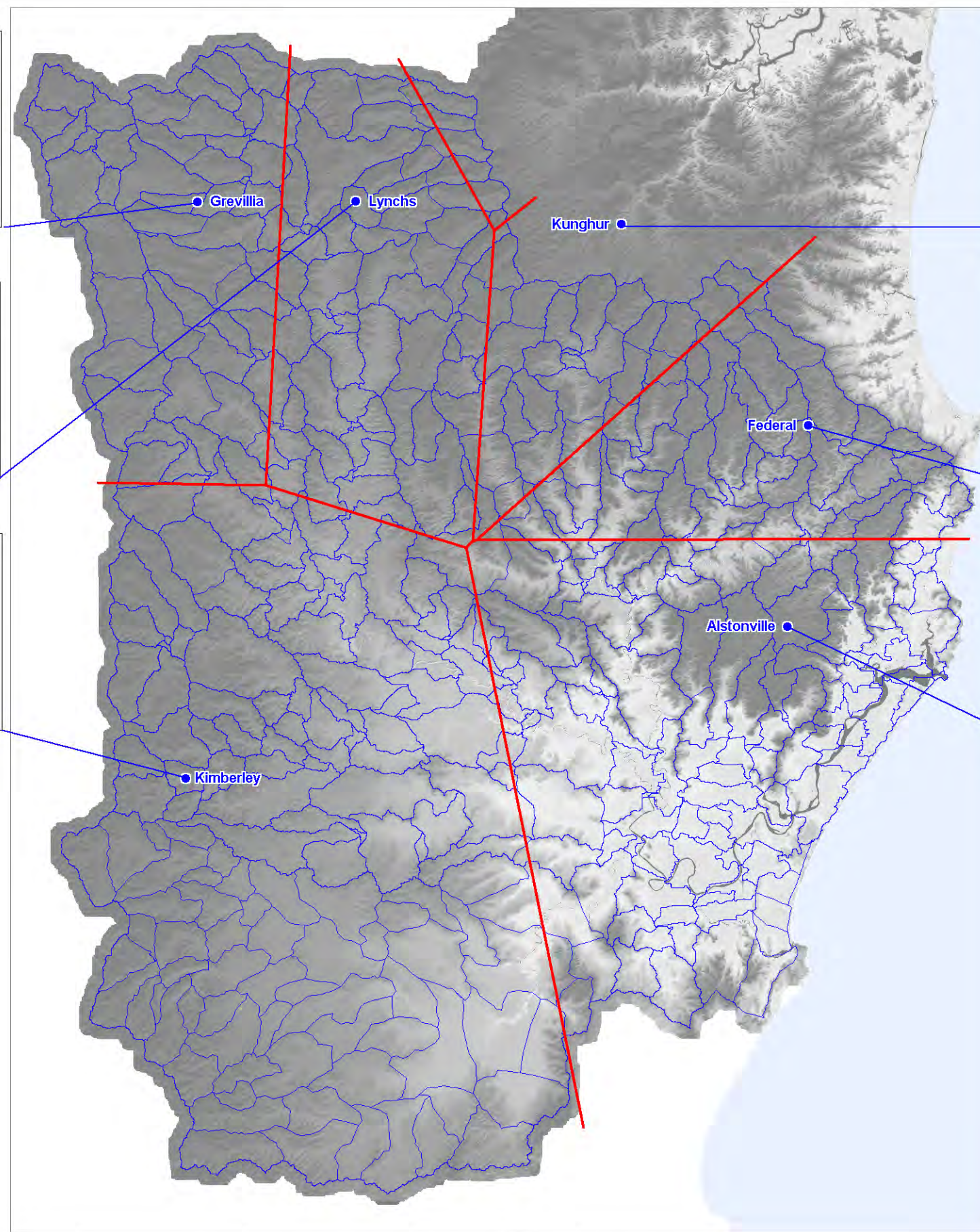
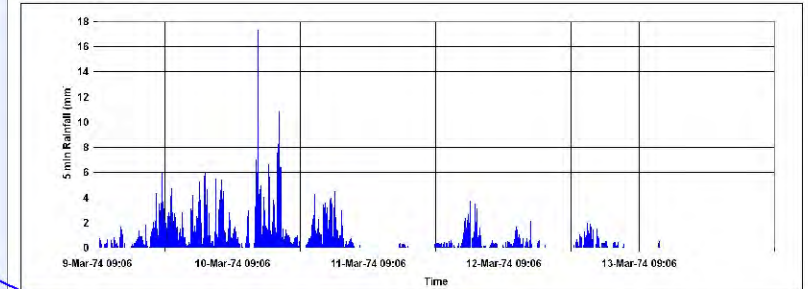
Kunghur






Federal



Alstonville



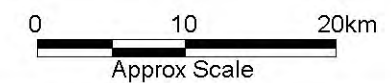
LEGEND

-  Hydrological Model Subcatchment Boundaries
-  Rainfall Station
-  Theissen Rainfall Distribution

Title:

**March 1974 Event
Pluviograph Distribution**

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Map:

5-9

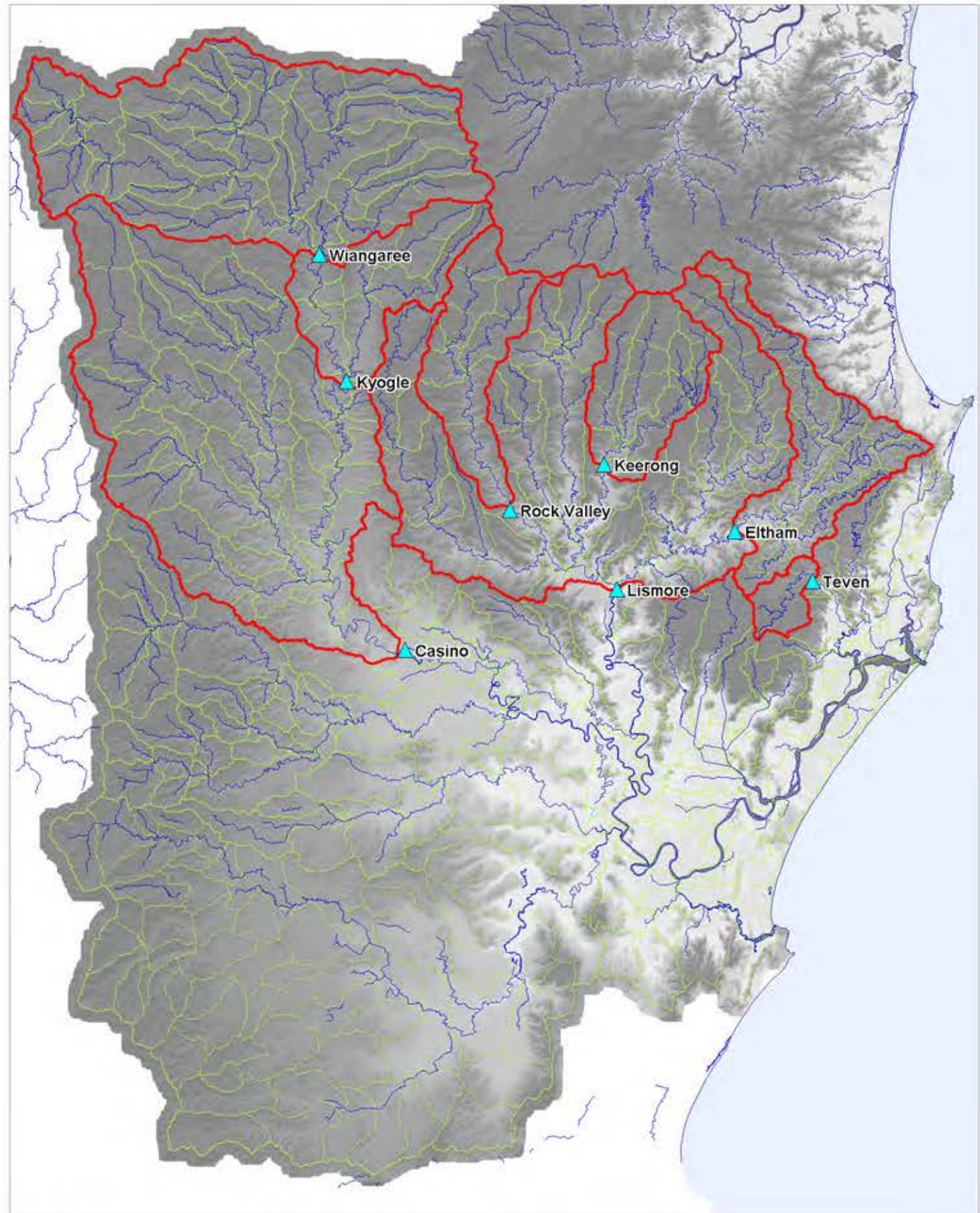
Rev:

A



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_027_091016_Pluviograph March 1974.WOR

Station_No	Station_Name
203,004	Casino
203,014	Eltham
203,022	Keerong
203,900	Kyogle
203,904	Lismore
203,010	Rock Valley
203,039	Teven
203,005	Wiangaree

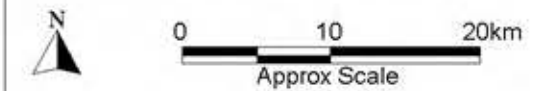


LEGEND

- Sub-catchment Boundaries
- Gauge Catchment Boundaries
- ▲ Stream Flow Gauge Station

Title:
March 1974 Event
Stream Gauge Locations - Hydrology

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

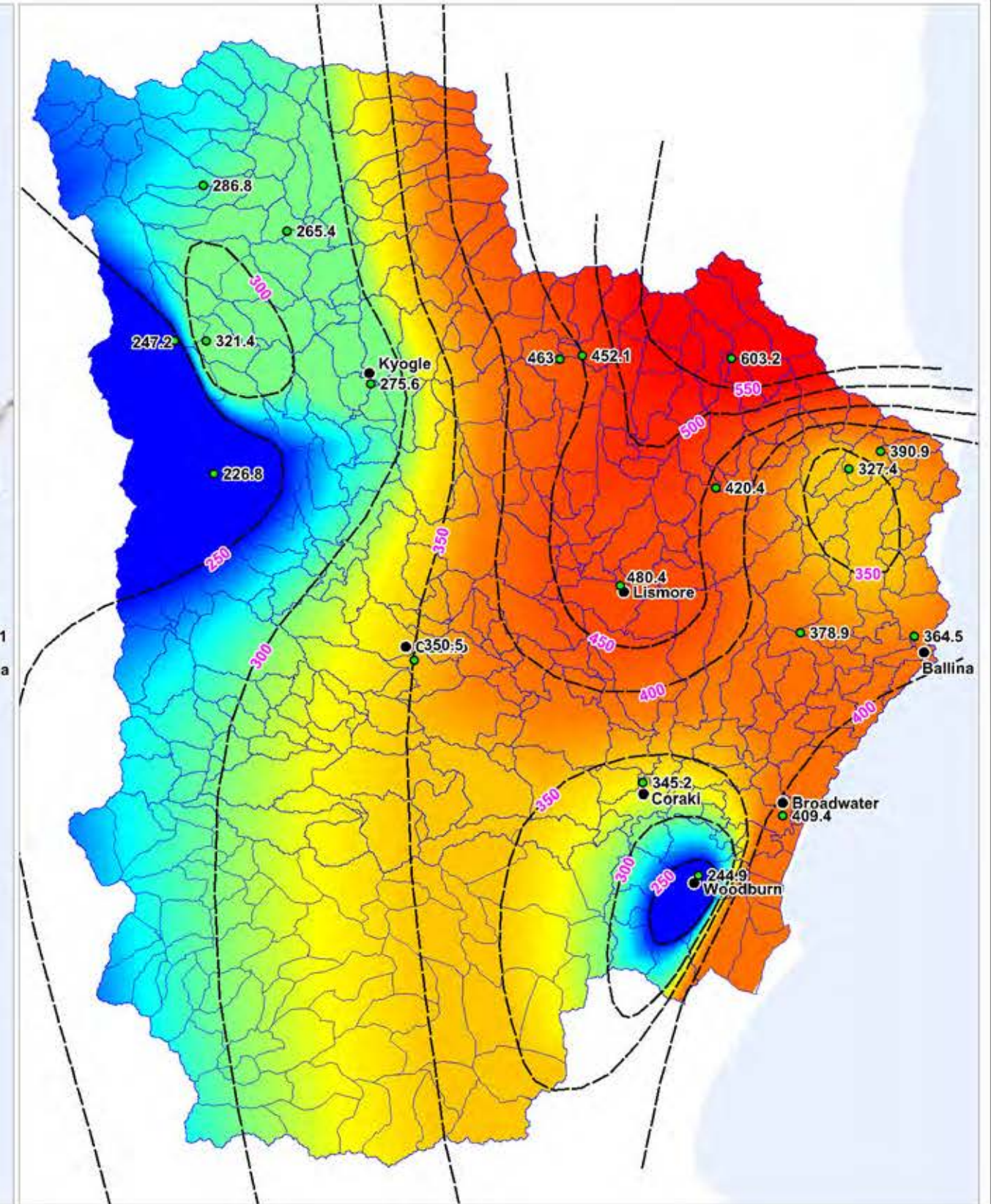
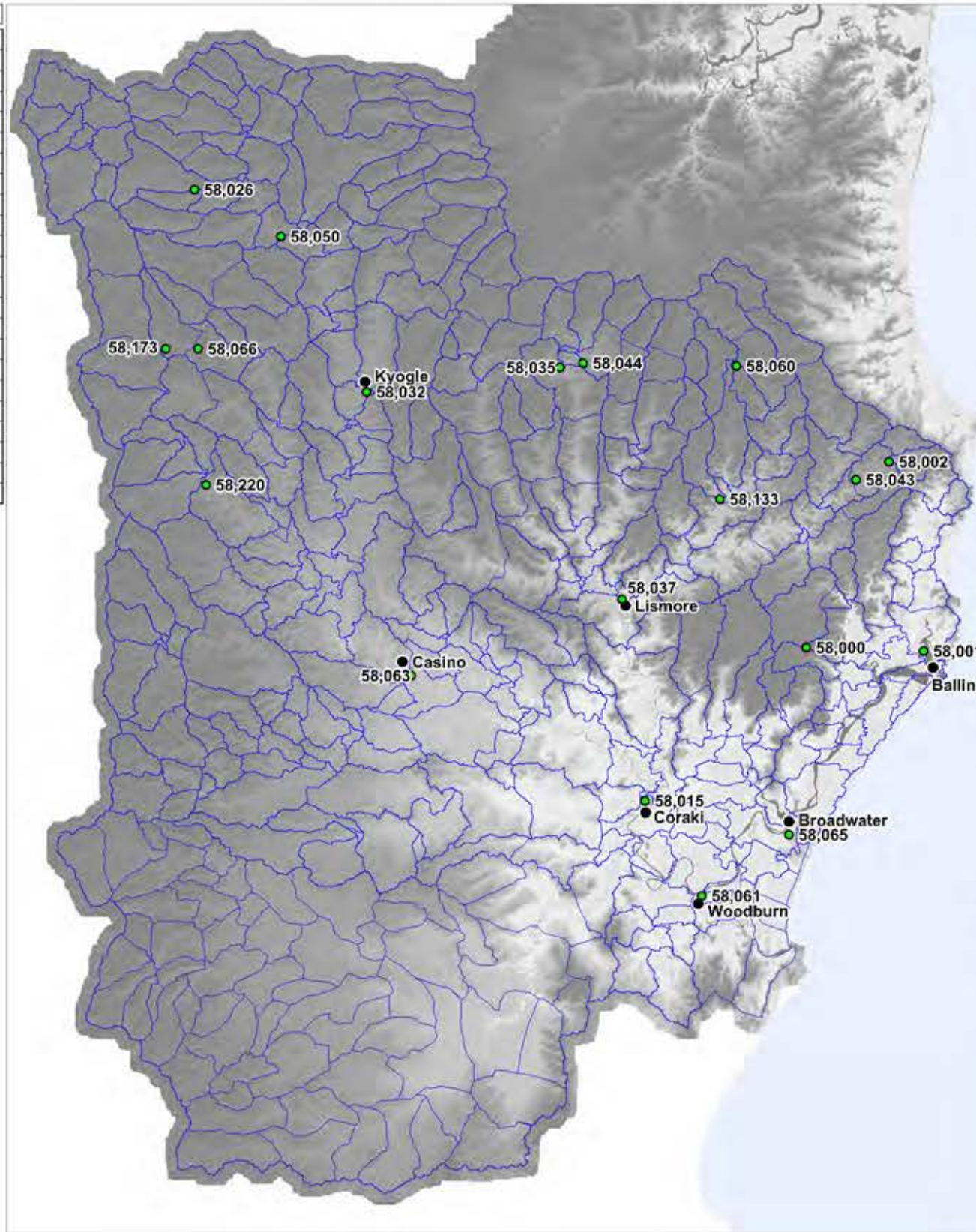


Map:	Rev:
5-10	A



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_056_091110_Gauges_1974.WOR

Station No.	Station Name
57,018	Tabulam Post Office
58,000	Alstonville Post Office
58,001	Ballina (Crowley Village)
58,002	Bangalow Motel
58,006	Brushgrove Post Office
58,014	Copmanhurst Post Office
58,015	Coraki Post Office
58,026	Grevillia (Summerland Way)
58,032	Kyogle Post Office
58,033	Lawrence Post Office
58,035	Lillian Rock
58,037	Lismore (Centre Street)
58,043	Newrybar
58,044	Nimbin Post Office
58,050	Roseberry State Forest Nursery
58,060	Whian Whian (Rummery Park)
58,061	Woodburn Post Office
58,063	Casino Airport
58,065	Broadwater Sugar Mill
58,066	Afterlee Post Office
58,133	Comdale (Willow Vale)
58,173	Toonumbar State Forest
58,220	Woolners Arm



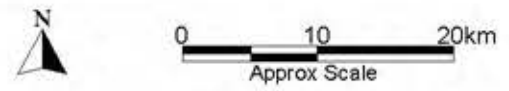
Notes:
 1. Total rainfall is recorded for between 09:00 19 February and 09:00 21 February 1954.

Title:
**February 1954 Event
 Gauge Locations and Rainfall**

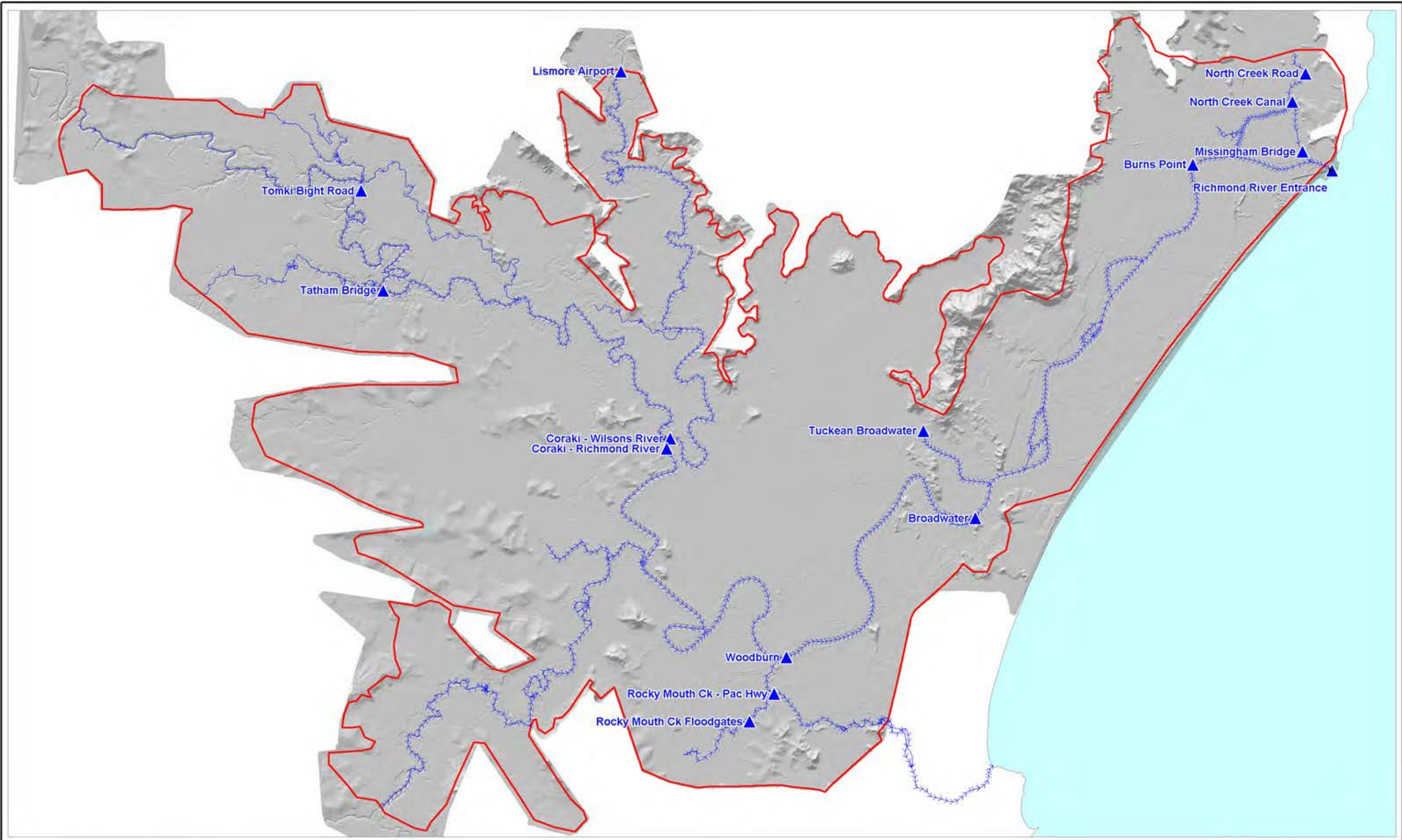
Map:
5-11




Rev.
A

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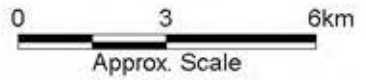
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- LEGEND**
-  2D Modelling Extent
 -  1994 Hydraulic Gauge Locations
 -  1D Channel Network

Title:
1994 Gauge Locations

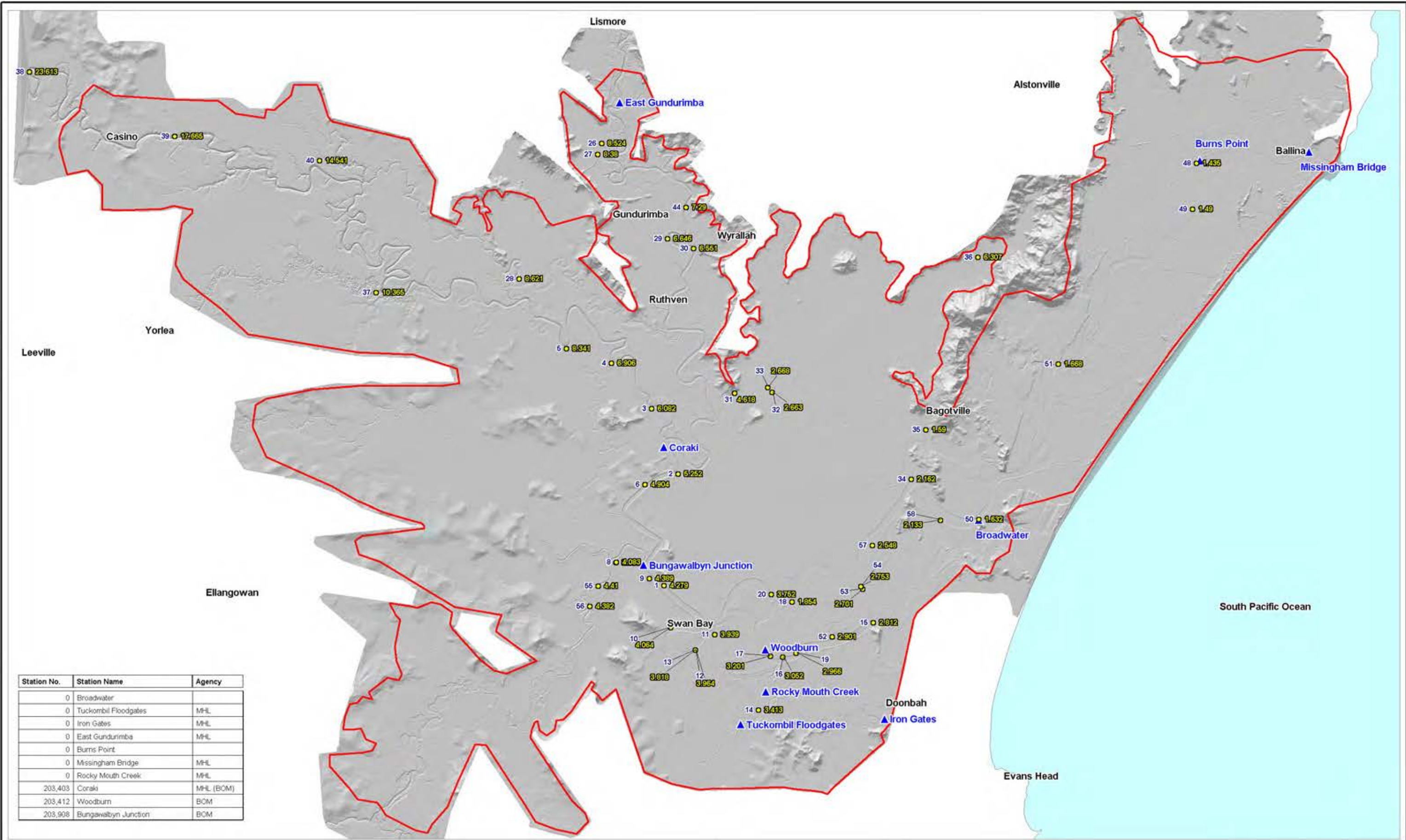
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Map: 5-12	Rev: A
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
Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_054_091110_Gauges_1994.wor



Station No.	Station Name	Agency
0	Broadwater	
0	Tuckombil Floodgates	MHL
0	Iron Gates	MHL
0	East Gundurimba	MHL
0	Burns Point	MHL
0	Missingham Bridge	MHL
0	Rocky Mouth Creek	MHL
203,403	Coraki	MHL (BOM)
203,412	Woodburn	BOM
203,908	Bungawalbyn Junction	BOM



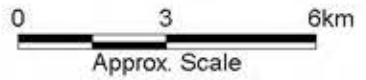
LEGEND

-  2D Modelling Extent
-  2009 Hydraulic Gauge Locations
-  2009 Flood Marks
-  Mark Number
-  Flood Levels

Title:
2009 Calibration Data

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

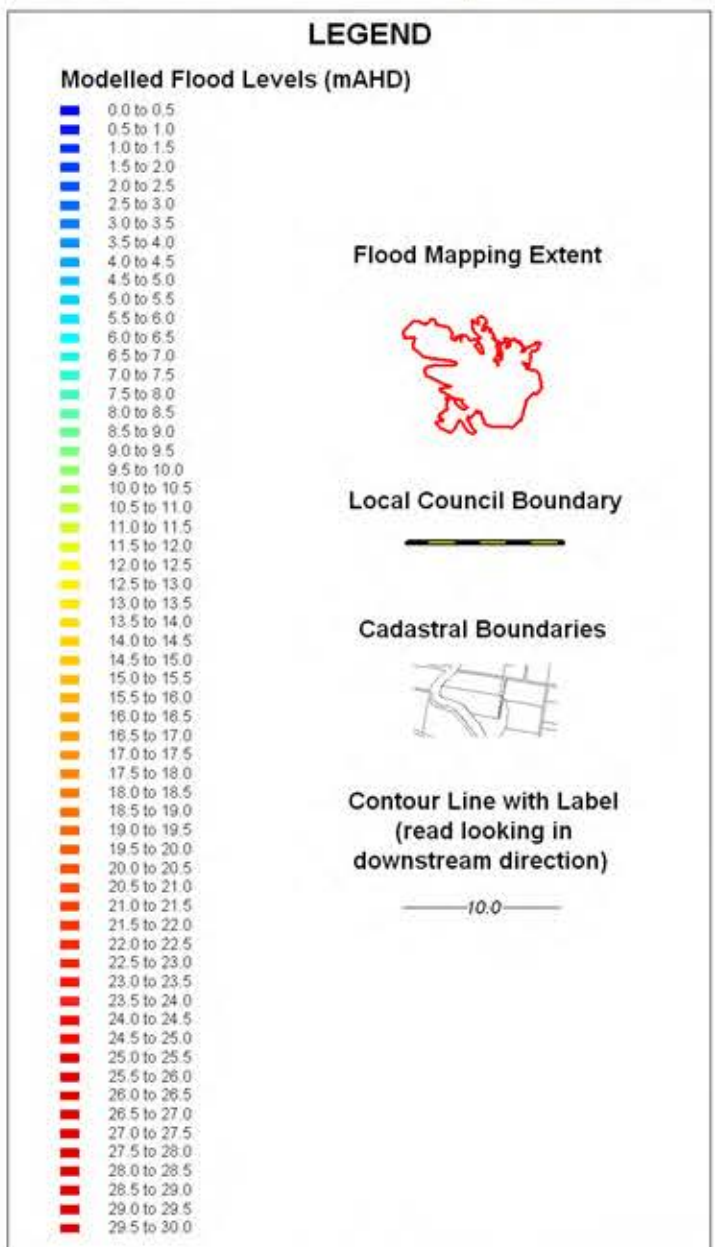
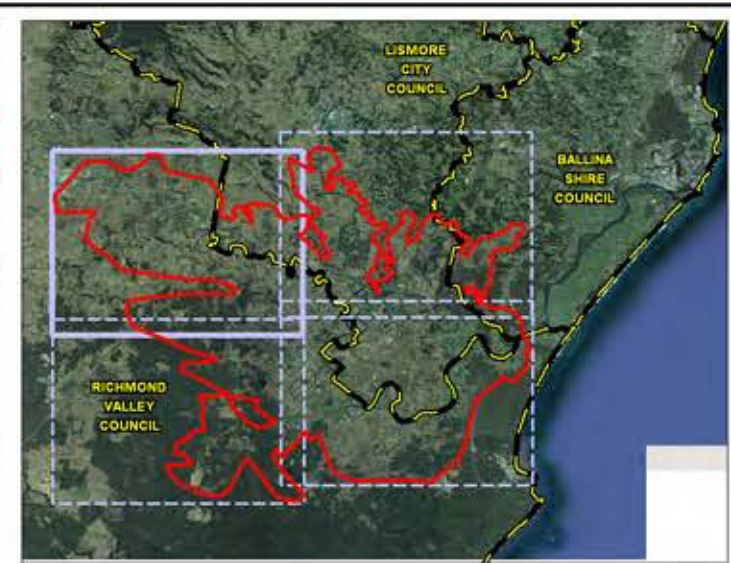
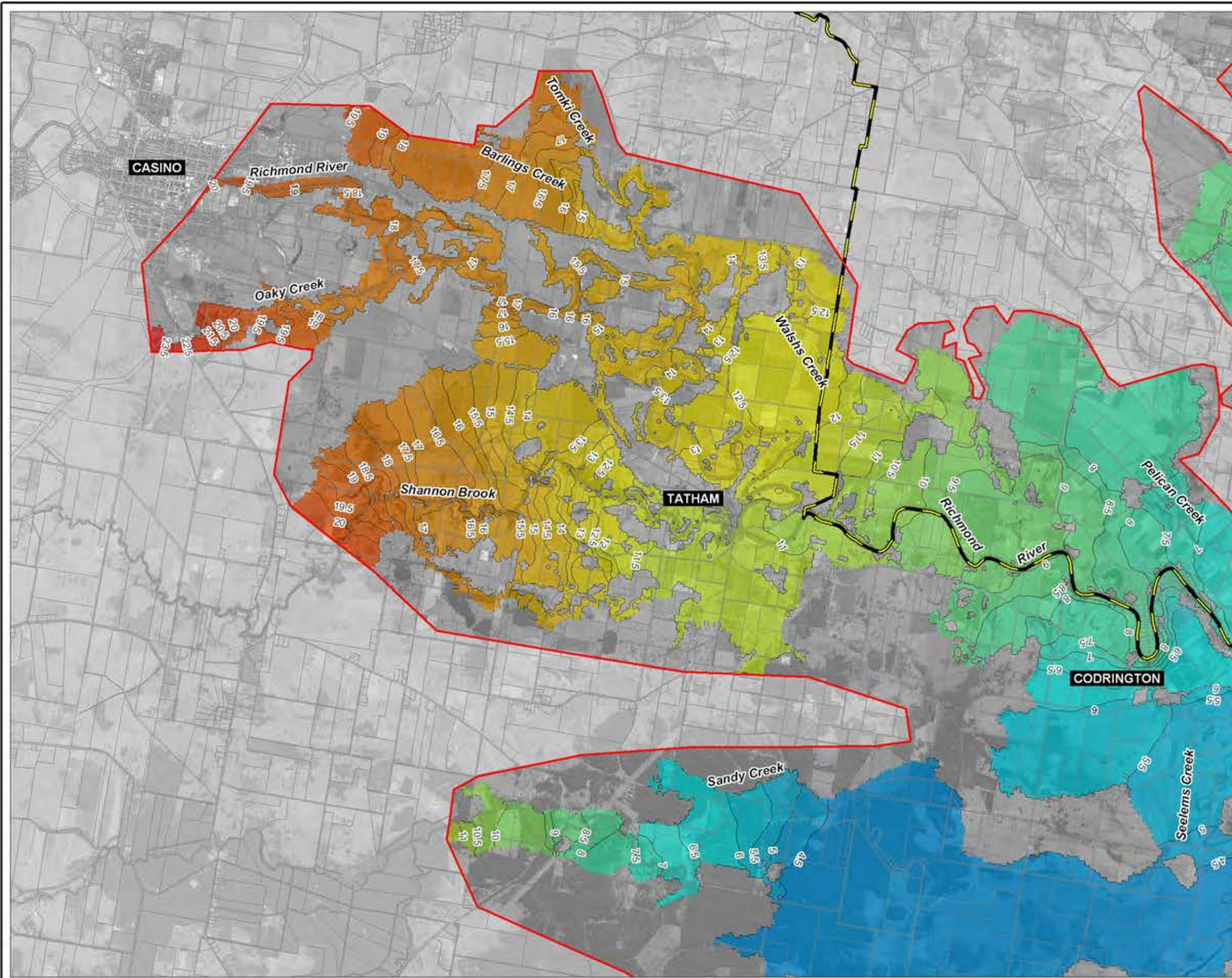
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Map:
5-13

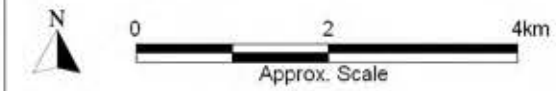
Rev:
A





Title:
2009 Peak Flood Levels - Sheet 1
 Richmond River (Casino to Codrington) and Deep Creek

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

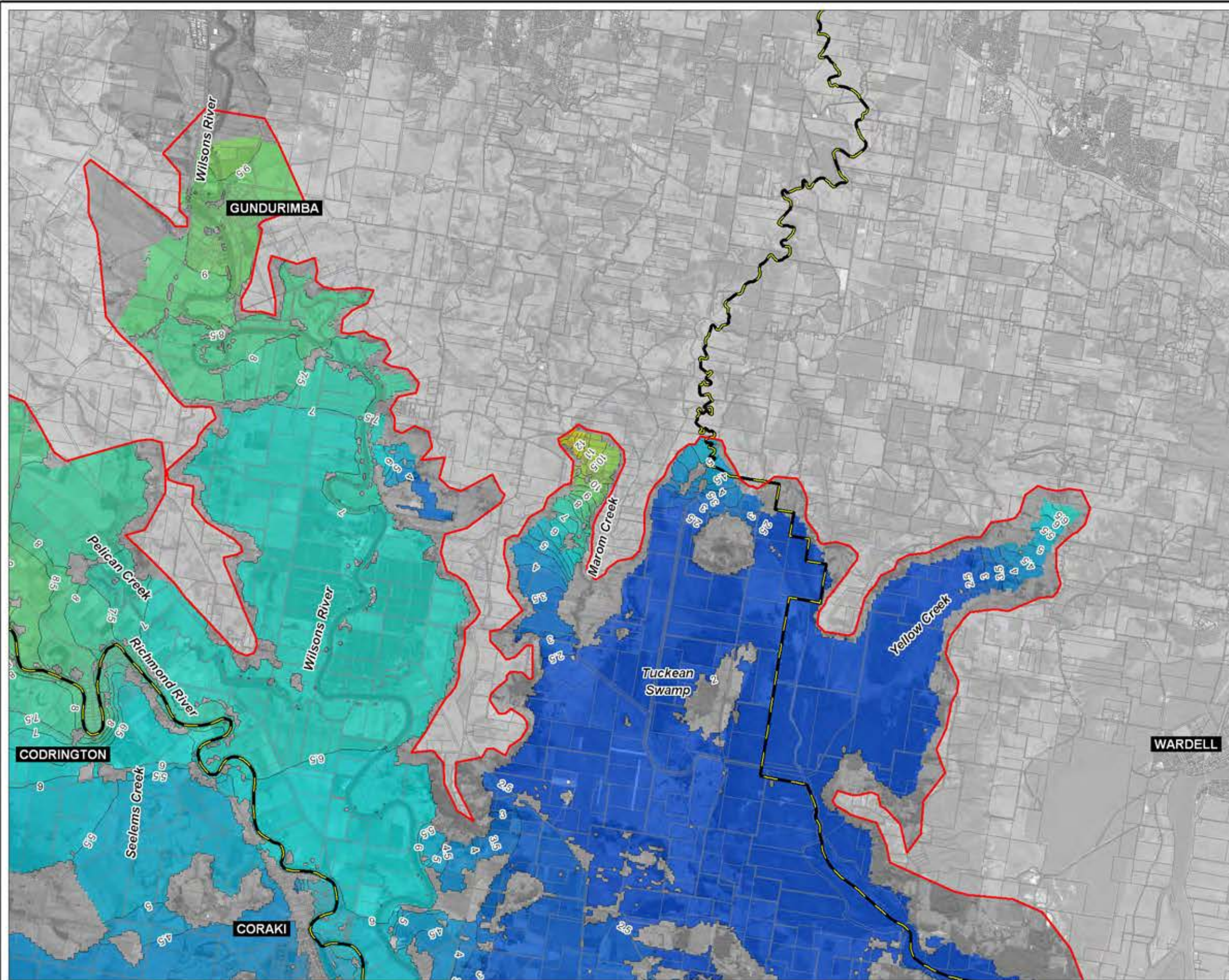


Map:
5-14

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_047_100312_2009_Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

- 0.0 to 0.5
- 0.5 to 1.0
- 1.0 to 1.5
- 1.5 to 2.0
- 2.0 to 2.5
- 2.5 to 3.0
- 3.0 to 3.5
- 3.5 to 4.0
- 4.0 to 4.5
- 4.5 to 5.0
- 5.0 to 5.5
- 5.5 to 6.0
- 6.0 to 6.5
- 6.5 to 7.0
- 7.0 to 7.5
- 7.5 to 8.0
- 8.0 to 8.5
- 8.5 to 9.0
- 9.0 to 9.5
- 9.5 to 10.0
- 10.0 to 10.5
- 10.5 to 11.0
- 11.0 to 11.5
- 11.5 to 12.0
- 12.0 to 12.5
- 12.5 to 13.0
- 13.0 to 13.5
- 13.5 to 14.0
- 14.0 to 14.5
- 14.5 to 15.0
- 15.0 to 15.5
- 15.5 to 16.0
- 16.0 to 16.5
- 16.5 to 17.0
- 17.0 to 17.5
- 17.5 to 18.0
- 18.0 to 18.5
- 18.5 to 19.0
- 19.0 to 19.5
- 19.5 to 20.0
- 20.0 to 20.5
- 20.5 to 21.0
- 21.0 to 21.5
- 21.5 to 22.0
- 22.0 to 22.5
- 22.5 to 23.0
- 23.0 to 23.5
- 23.5 to 24.0
- 24.0 to 24.5
- 24.5 to 25.0
- 25.0 to 25.5
- 25.5 to 26.0
- 26.0 to 26.5
- 26.5 to 27.0
- 27.0 to 27.5
- 27.5 to 28.0
- 28.0 to 28.5
- 28.5 to 29.0
- 29.0 to 29.5
- 29.5 to 30.0

Flood Mapping Extent



Local Council Boundary



Cadastral Boundaries



**Contour Line with Label
(read looking in
downstream direction)**



Title:
2009 Peak Flood Levels - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuclean Swamp

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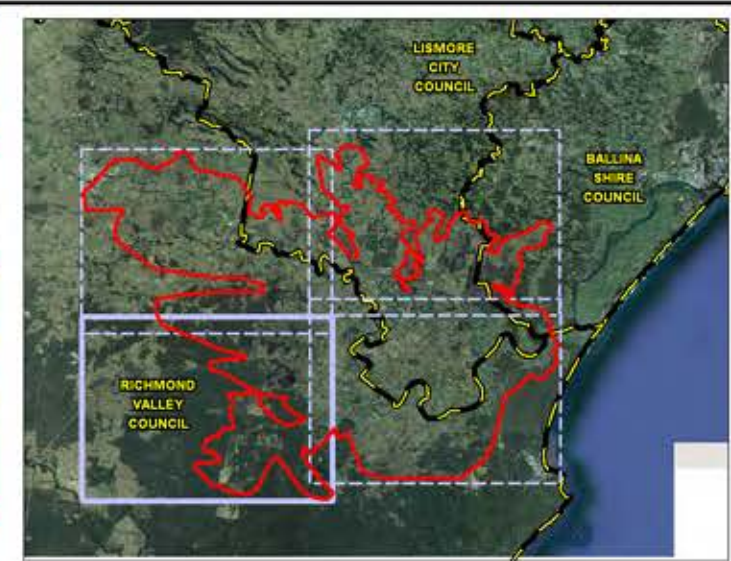


Map:
5-15

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_047_100312_2009_Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
2009 ARI Peak Flood Levels - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

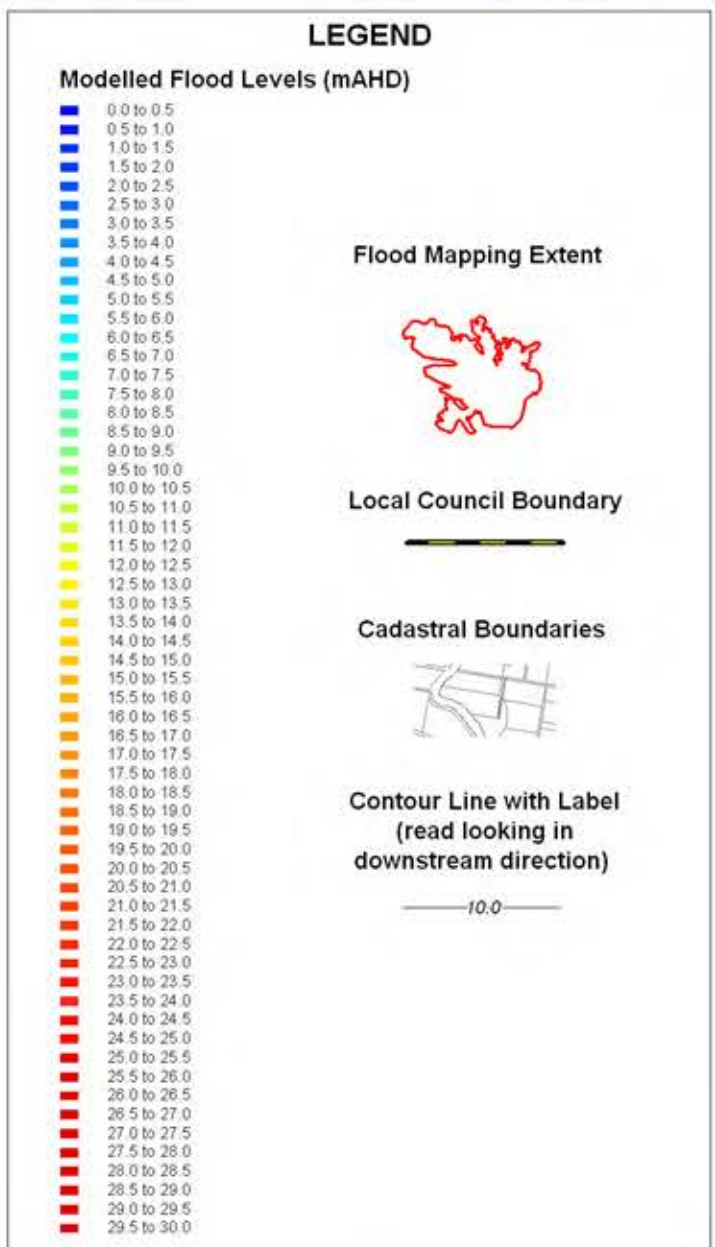
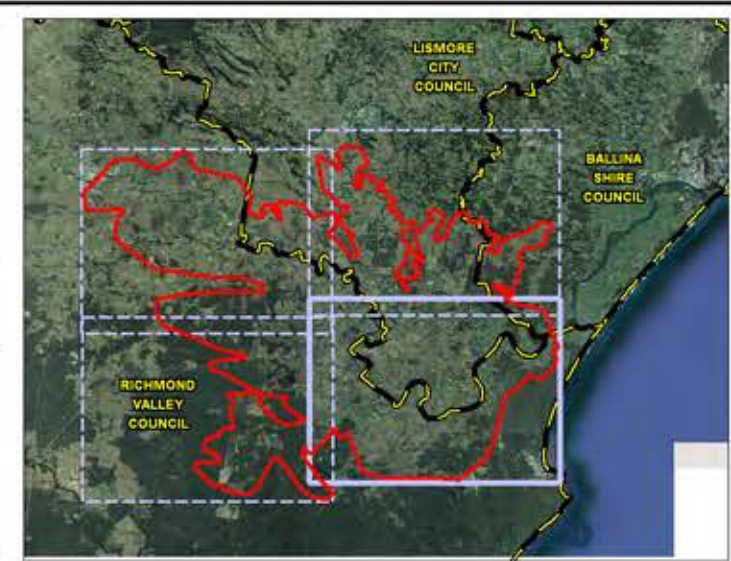
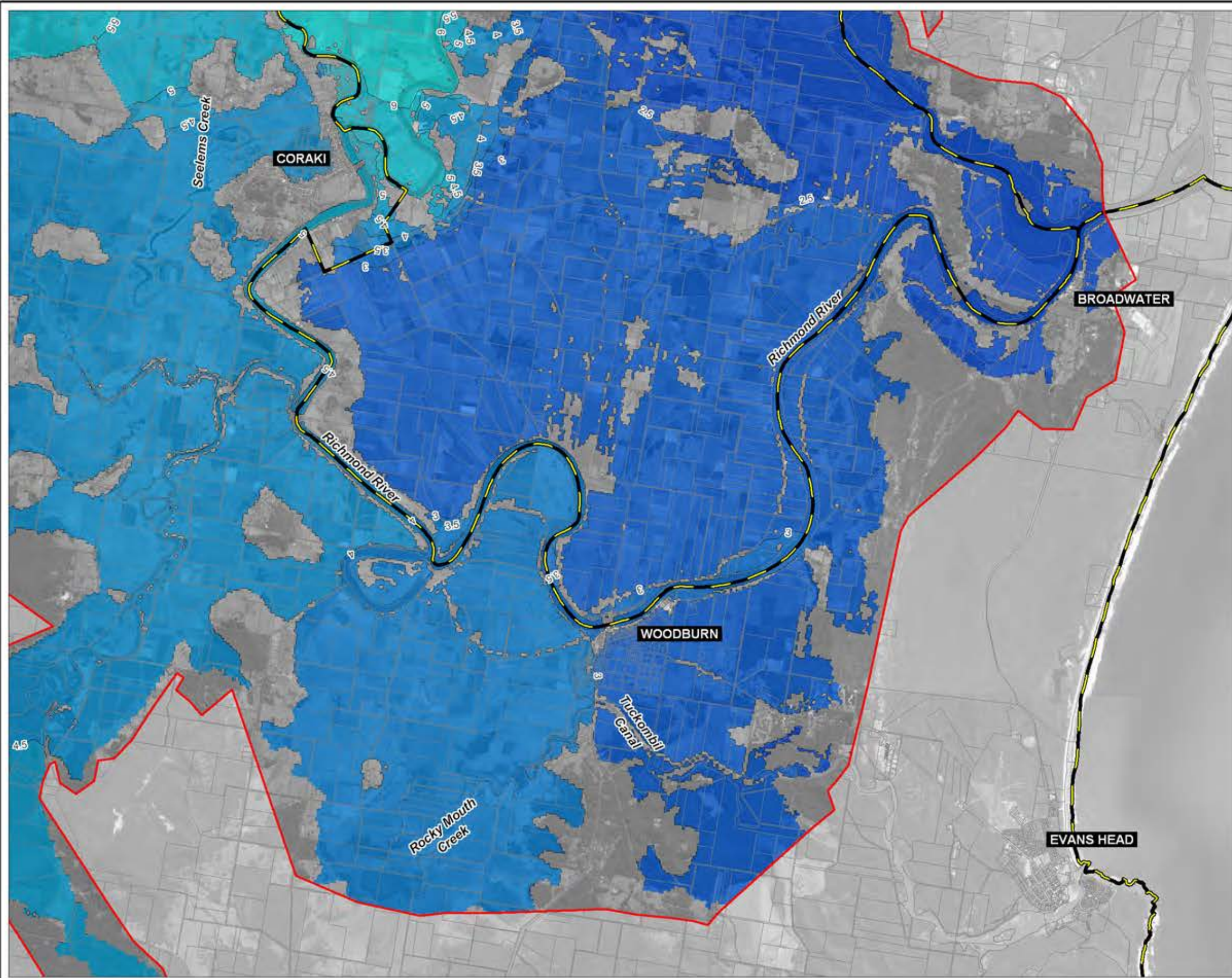


Map:
5-16

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_047_100312_2009_Levels_RevC.wor



Title:
2009 Peak Flood Levels - Sheet 4
 Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

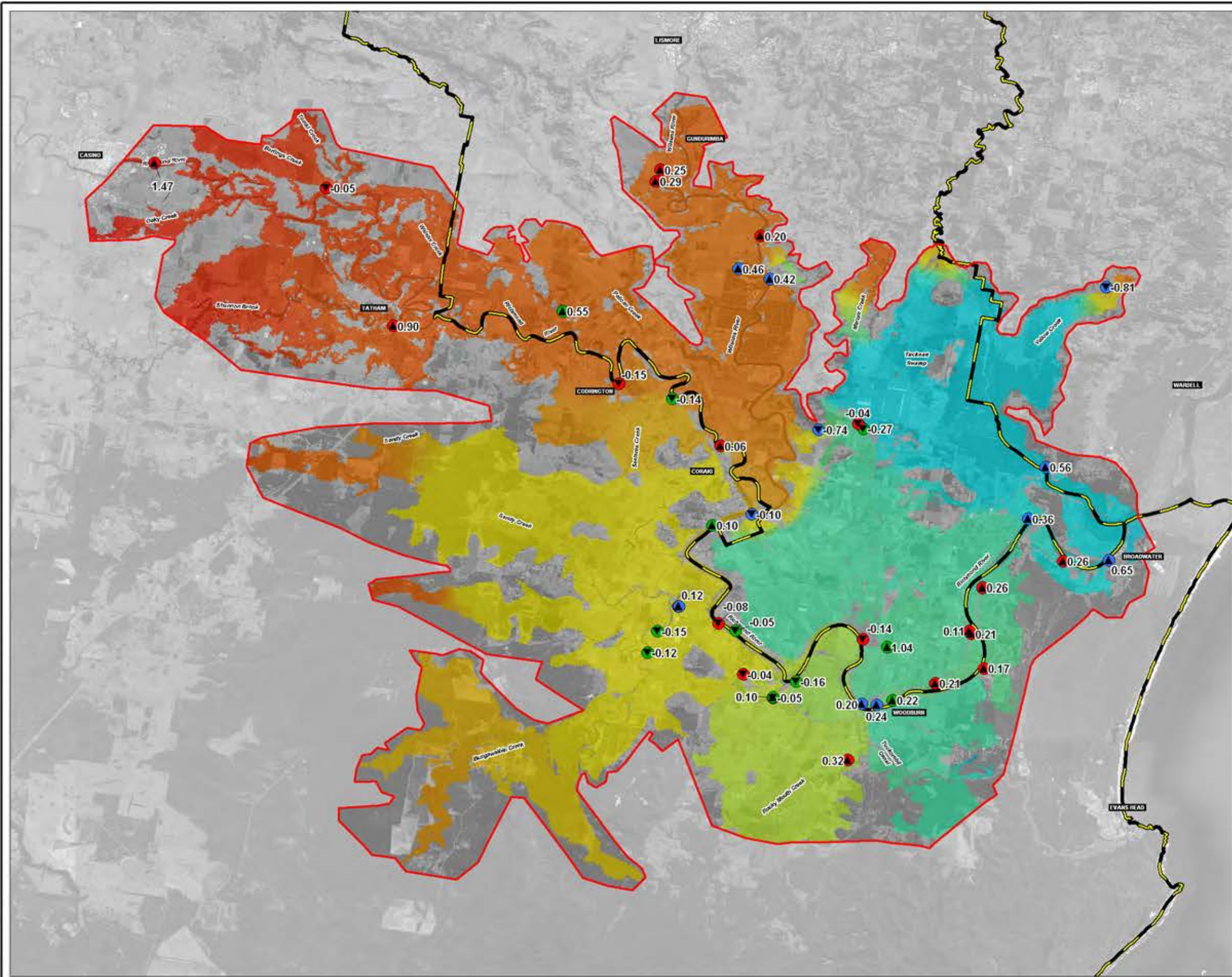
Map:
5-17

Rev:
C

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Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_047_100312_2009_Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

Flood Depth Mapping Extent

Local Council Boundary

Model Above Recorded Level

Model Below Recorded Level

High Reliability

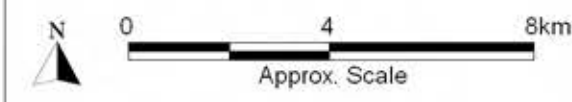
Medium Reliability

Low Reliability



Title:
2009 Calibration Summary

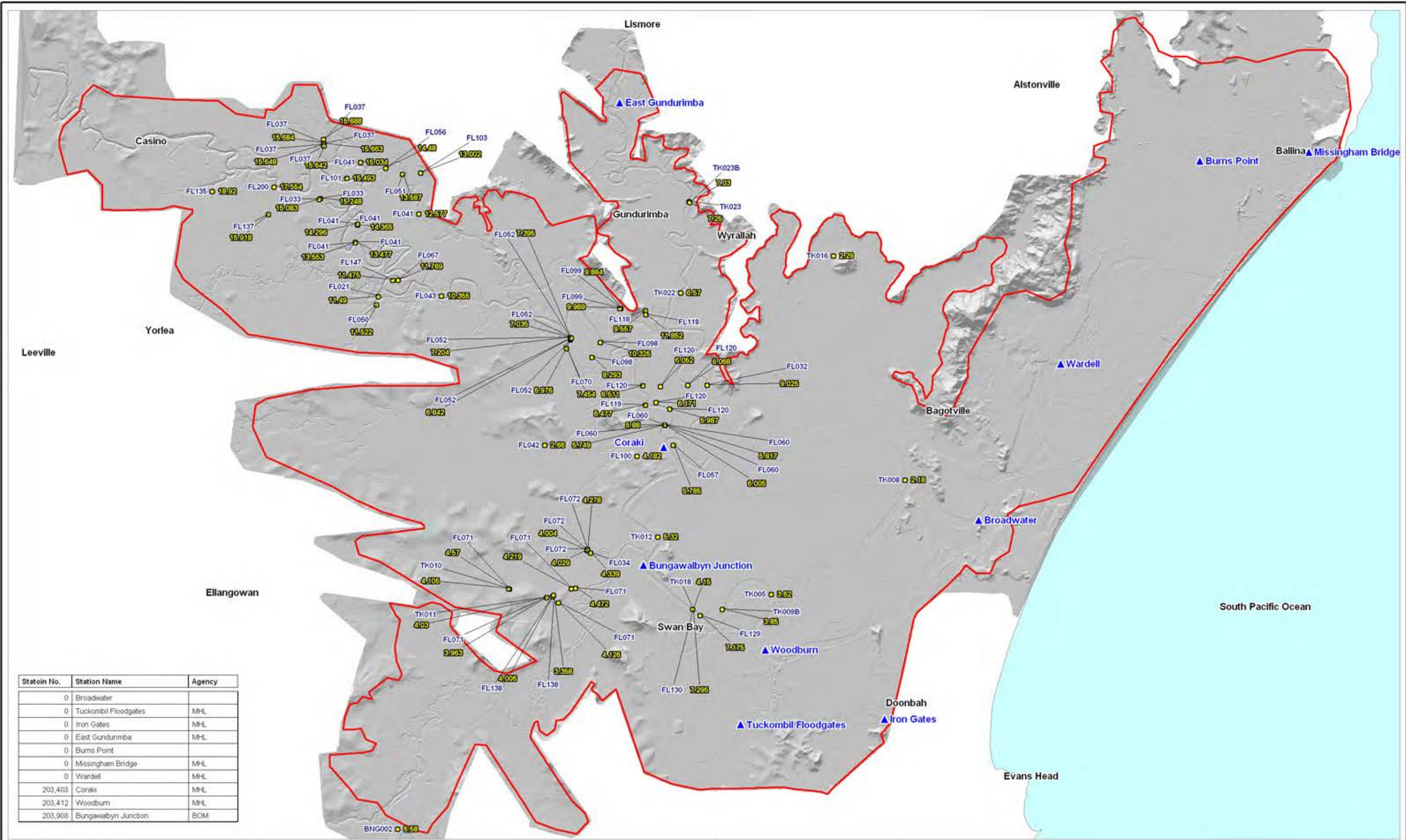
BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



Map:
5-18

Rev:
C





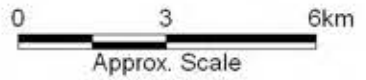
Station No.	Station Name	Agency
0	Broadwater	
0	Tuckombil Floodgates	MHL
0	Iron Gates	MHL
0	East Gundurimba	MHL
0	Burns Point	
0	Missingham Bridge	MHL
0	Wardell	MHL
203,403	Coraki	MHL
203,412	Woodburn	MHL
203,908	Bungawalbyn Junction	BOM



- LEGEND**
- 2D Modelling Extent
 - 2008 Hydraulic Gauge Locations
 - 2008 Flood Marks
 - Mark Number
 - Flood Levels

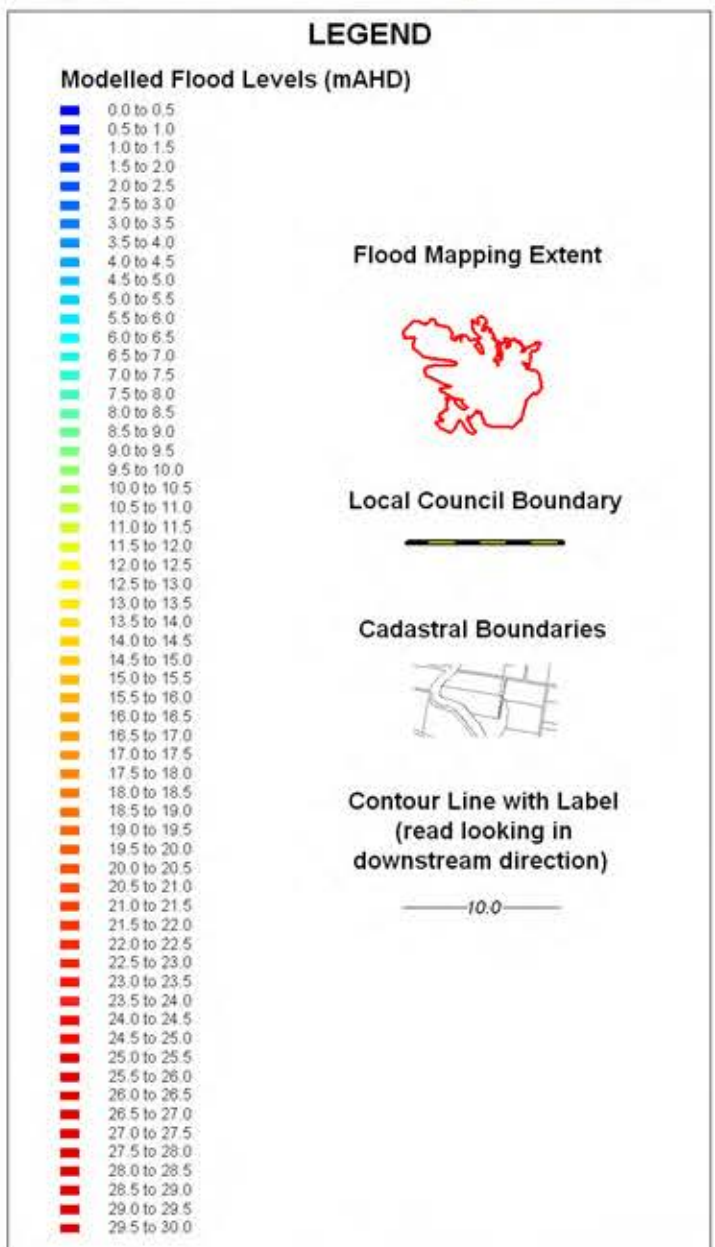
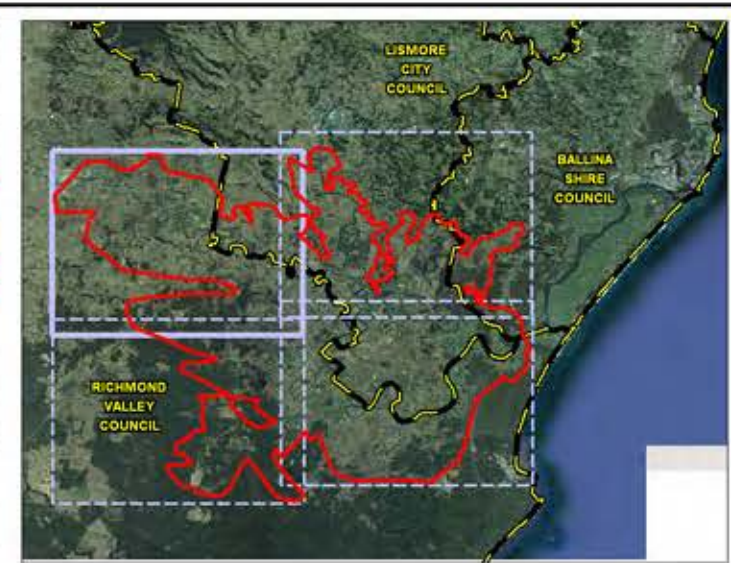
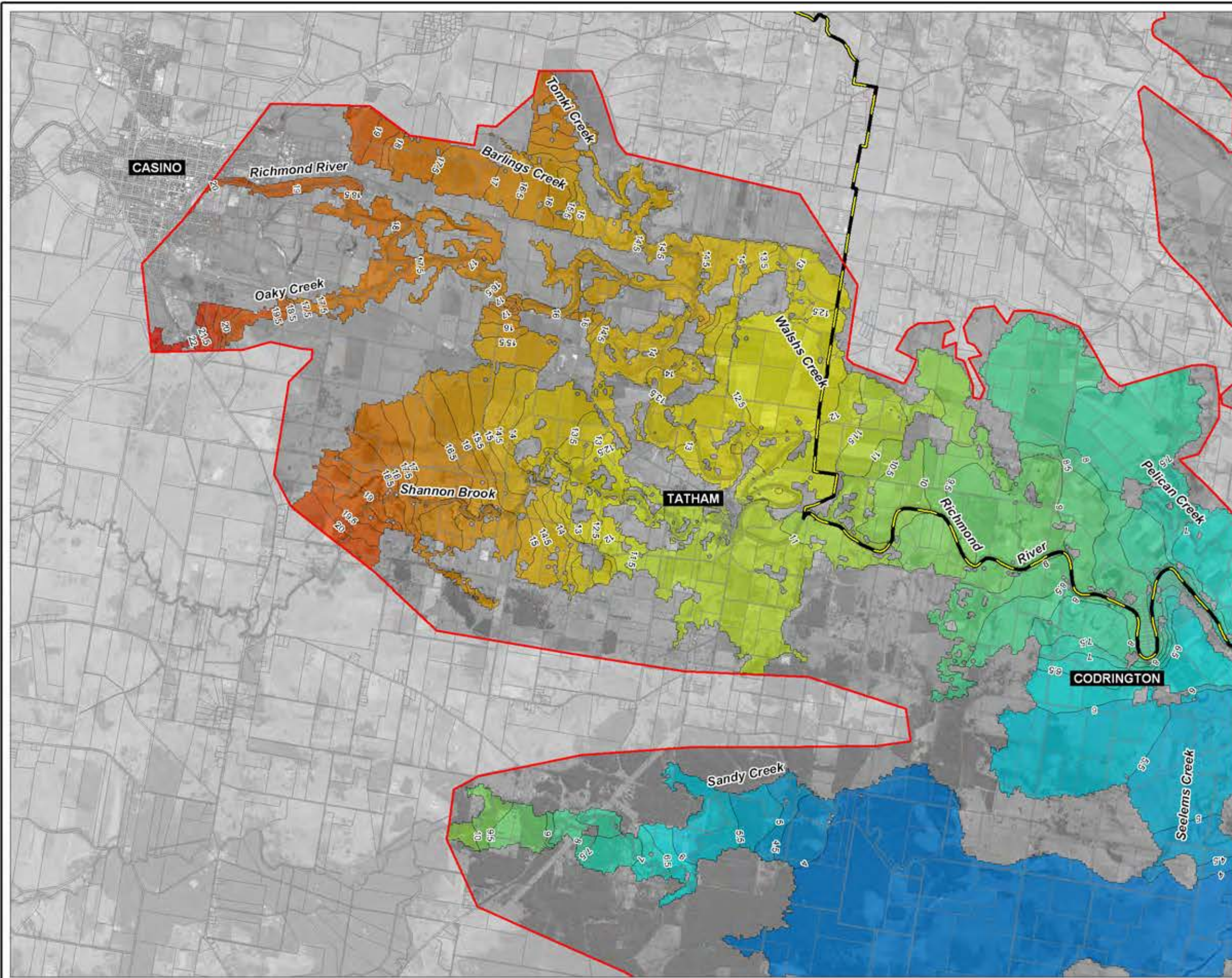
Title:
2008 Verification Data

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



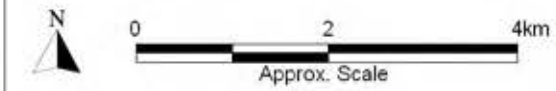
Map: **5-19** Rev: **B**





Title:
2008 Peak Flood Levels - Sheet 1
 Richmond River (Casino to Codrington) and Deep Creek

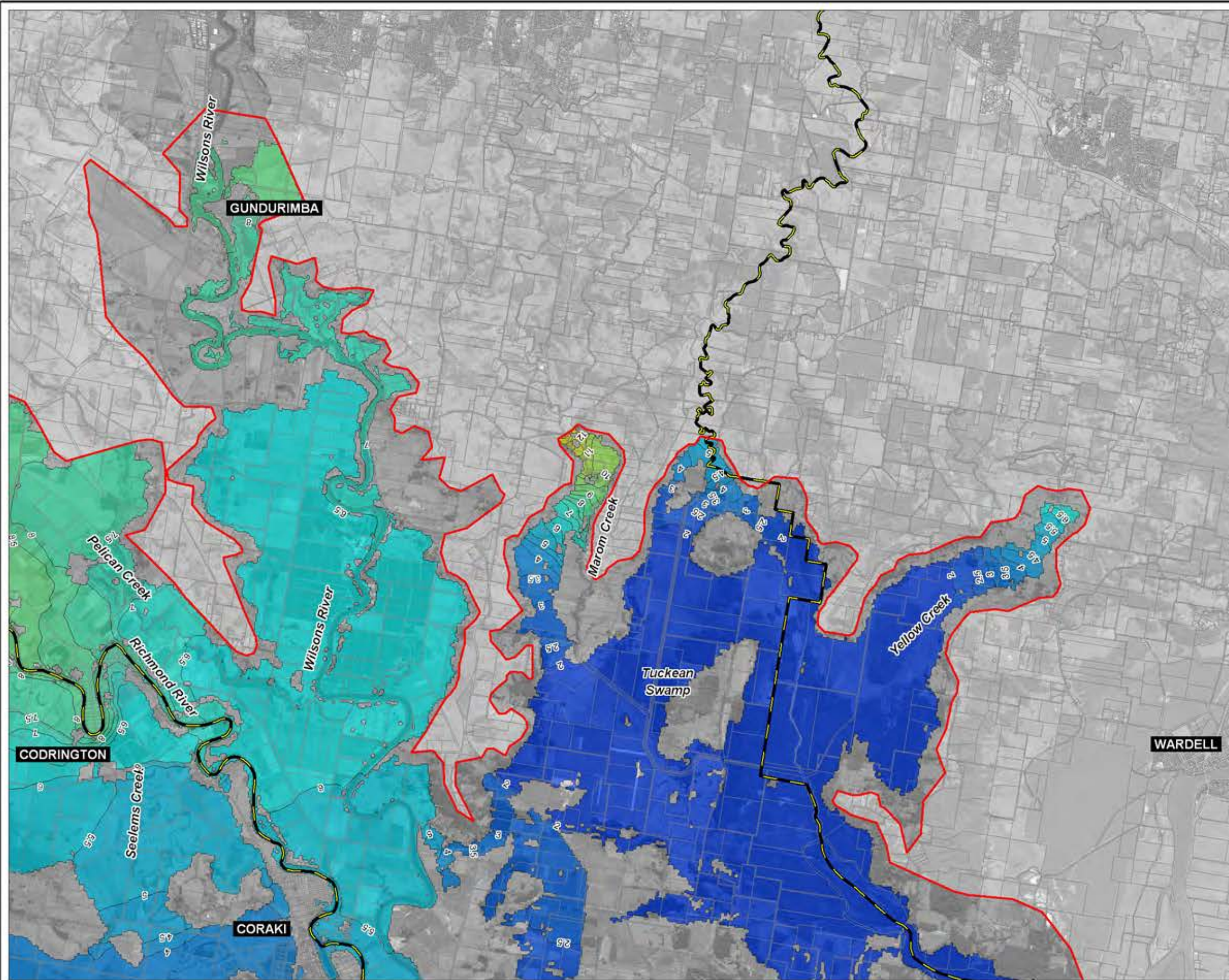
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Map: **5-20**
 Rev: **C**



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_046_100312_2008_Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHd)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
2008 Peak Flood Levels - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

Map: 5-21 **Rev:** C

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Approx. Scale

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Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_046_100312_2008_Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAH)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
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8.0 to 8.5
8.5 to 9.0
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14.5 to 15.0
15.0 to 15.5
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22.5 to 23.0
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24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

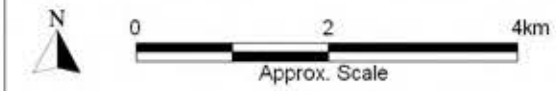
Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
2008 ARI Peak Flood Levels - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

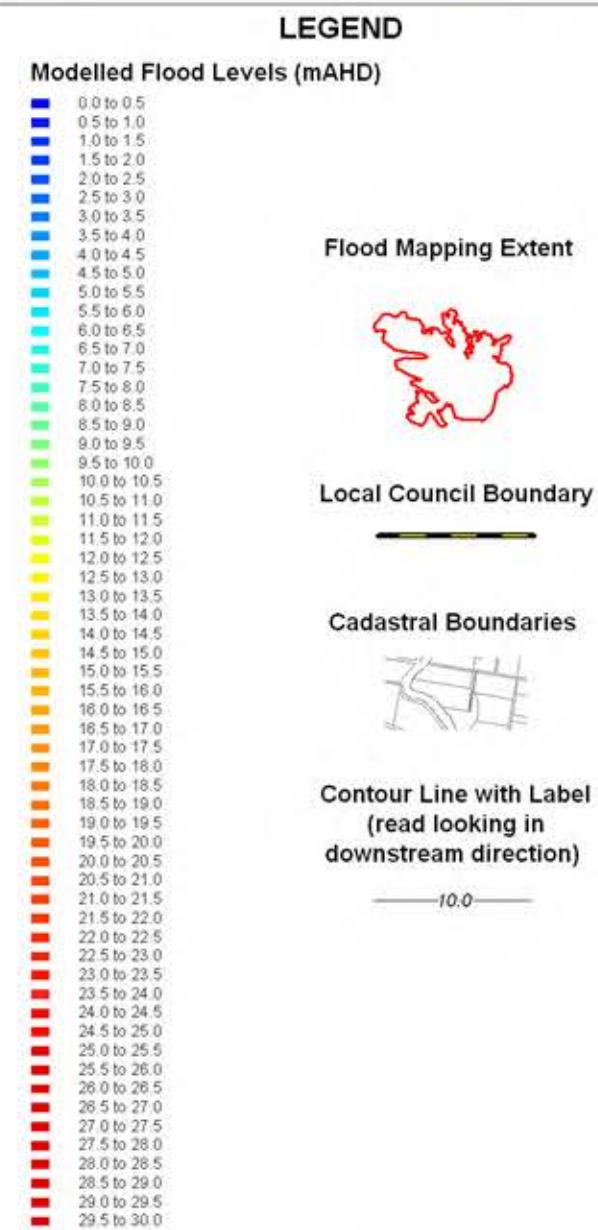
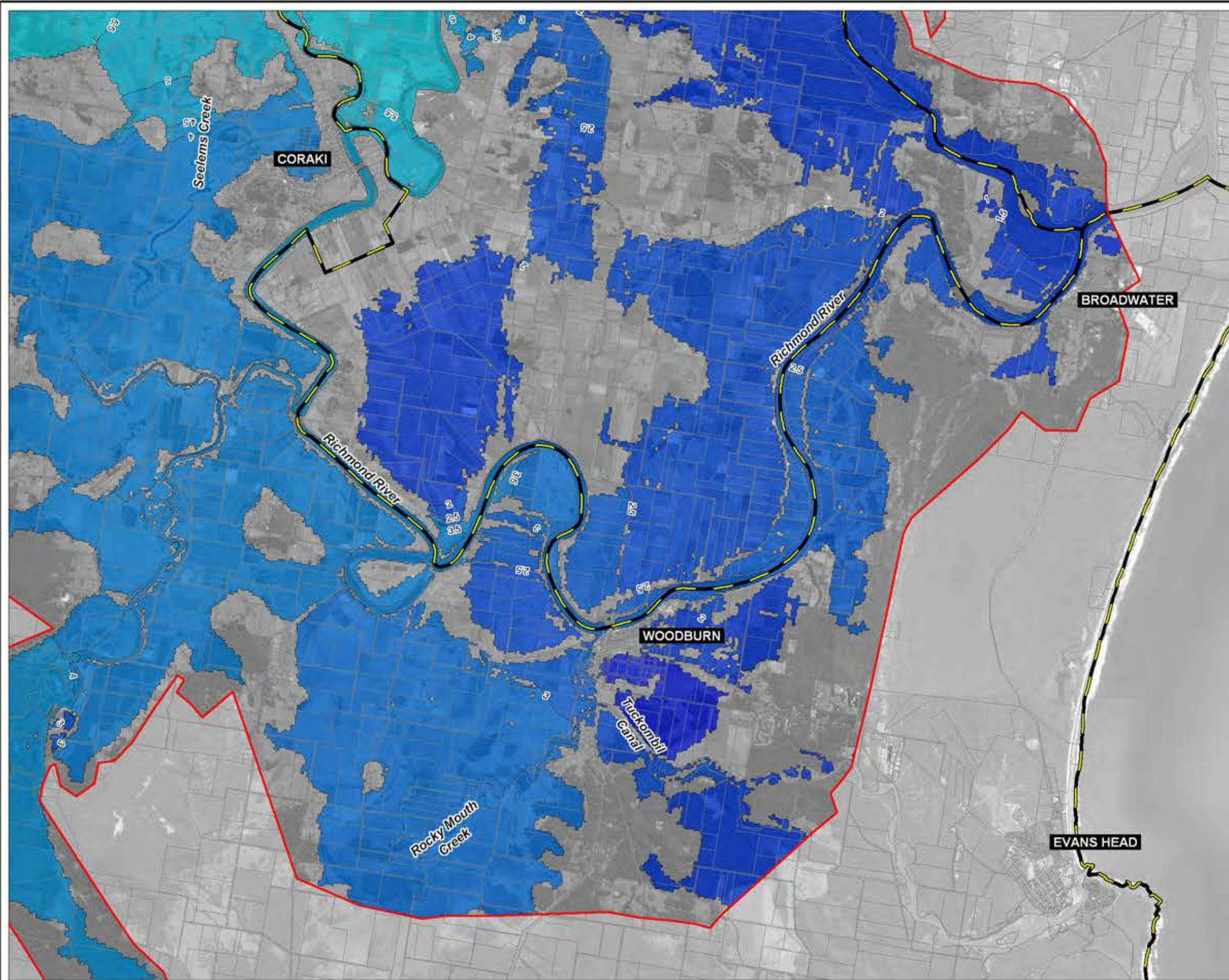


Map:
5-22

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_046_100312_2008_Levels_RevC.wor



Title:
2008 Peak Flood Levels - Sheet 4
 Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

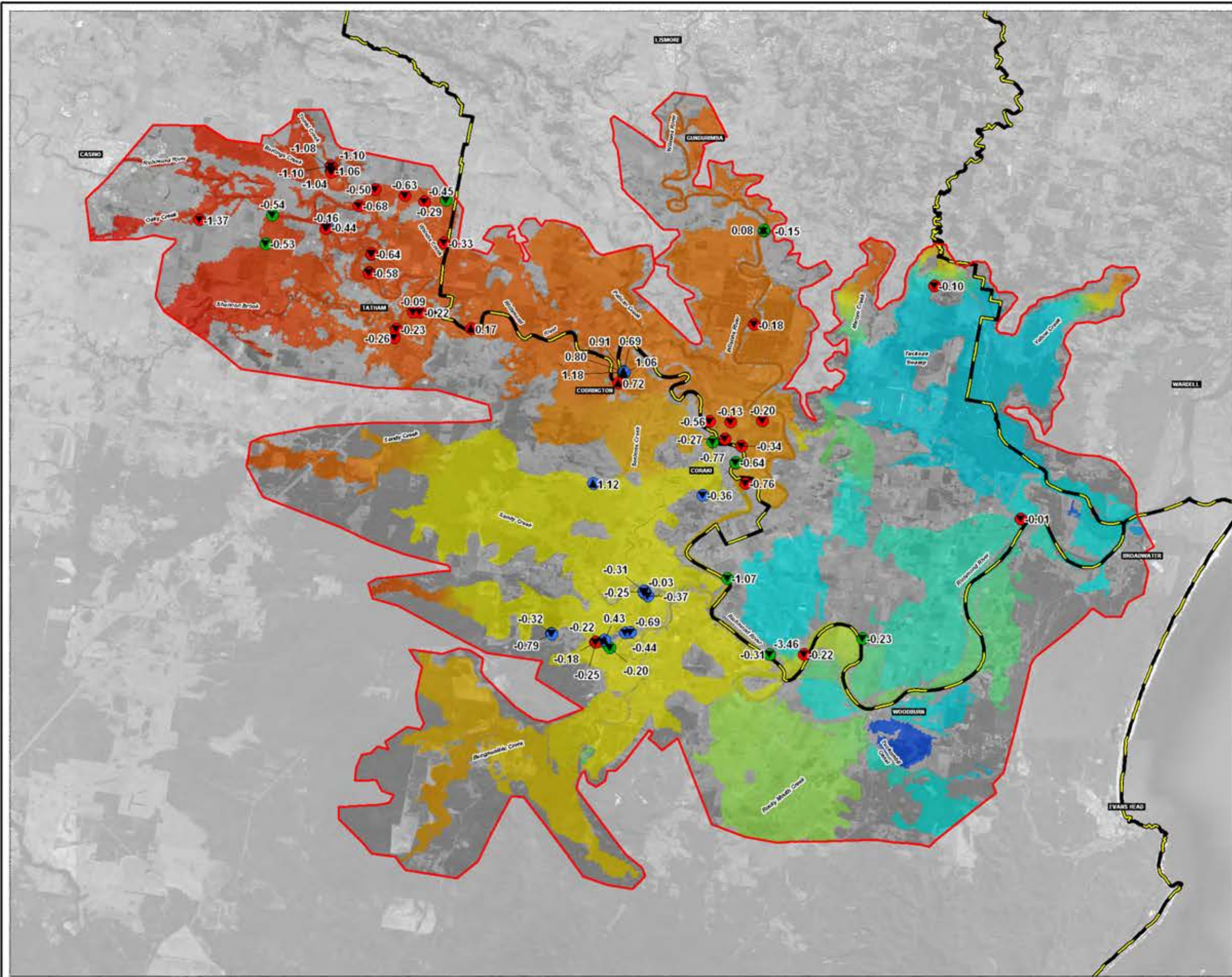


Map:
5-23

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_046_100312_2008_Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

30.00
20.00
15.00
10.00
5.00
0.00

Flood Depth Mapping Extent

Local Council Boundary

Model Above Recorded Level

Model Below Recorded Level

High Reliability (Red dot)

Medium Reliability (Green dot)

Low Reliability (Blue dot)

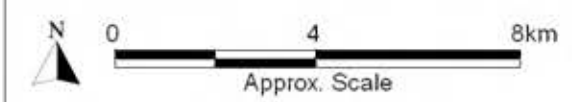


Title:
2008 Verification Summary

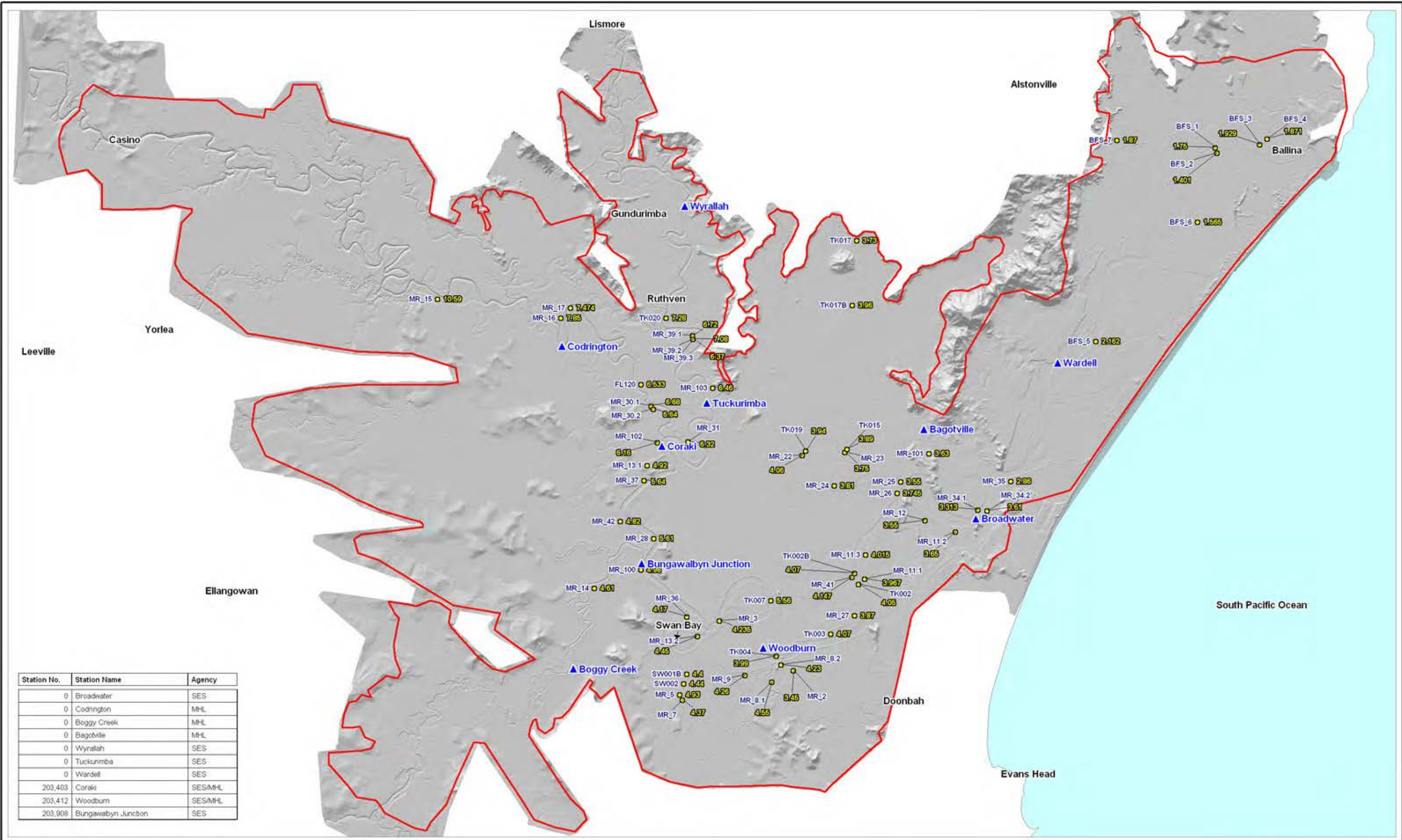
Map:
5-24

Rev:
C

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Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRGIFLD_061_100313 2008 Verification Summary_RevC.wor



Station No.	Station Name	Agency
0	Broadwater	SES
0	Codrington	MHL
0	Boggie Creek	MHL
0	Bagotville	MHL
0	Wyalah	SES
0	Tuckurimba	SES
0	Wardell	SES
203,403	Coraki	SES/MHL
203,412	Woodburn	SES/MHL
203,908	Bungawalbyn Junction	SES

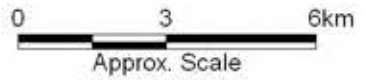


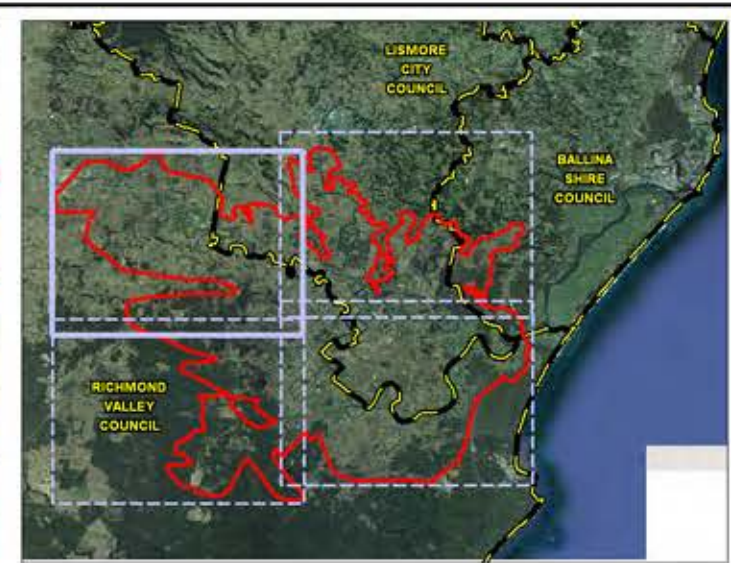
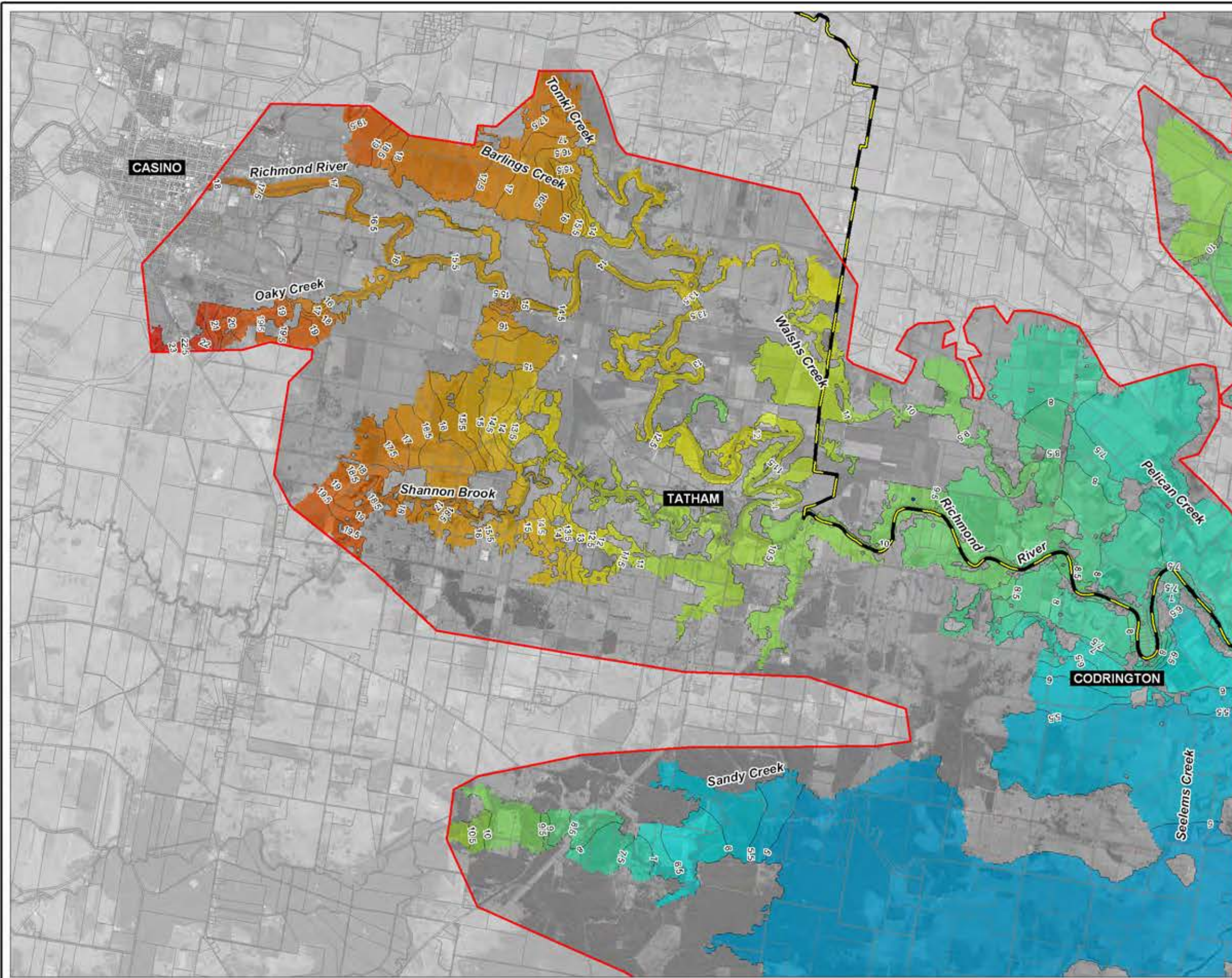
LEGEND

-  2D Modelling Extent
-  1974 Hydraulic Gauge Locations
-  1974 Flood Marks
-  Mark Number
-  Flood Levels

Title:
1974 Verification Data

Map: **5-25** Rev: **B**





LEGEND

Modelled Flood Levels (mAHD)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1974 Peak Flood Levels - Sheet 1
 Richmond River (Casino to Codrington) and Deep Creek

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

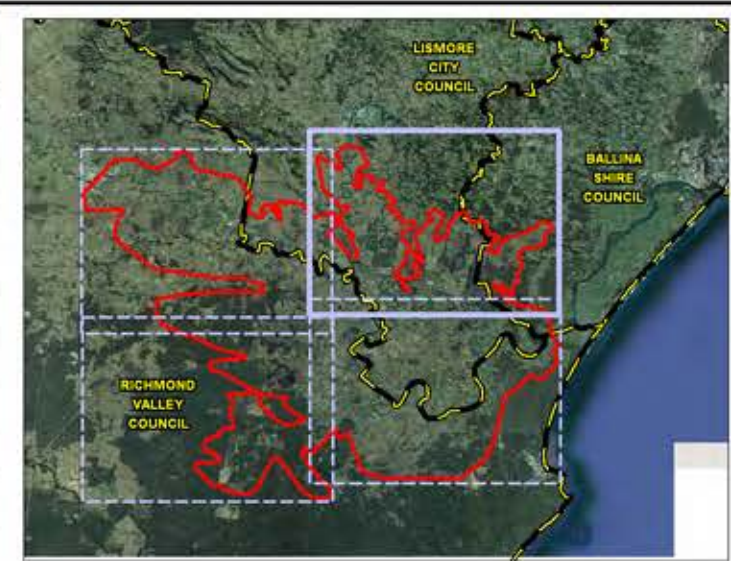
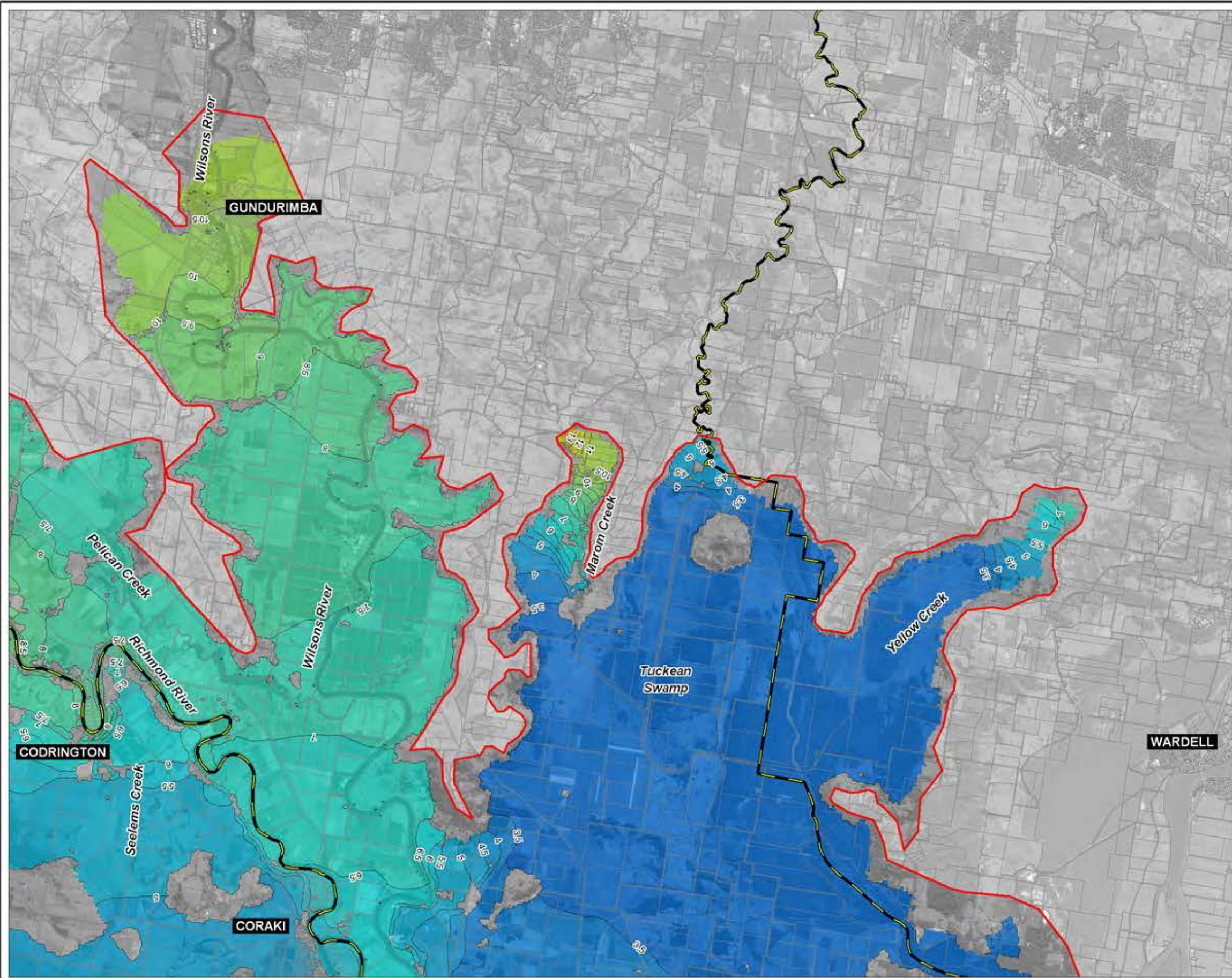


Map:
5-26

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_043_100312_1974 Flood Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1974 Flood Peak Levels - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

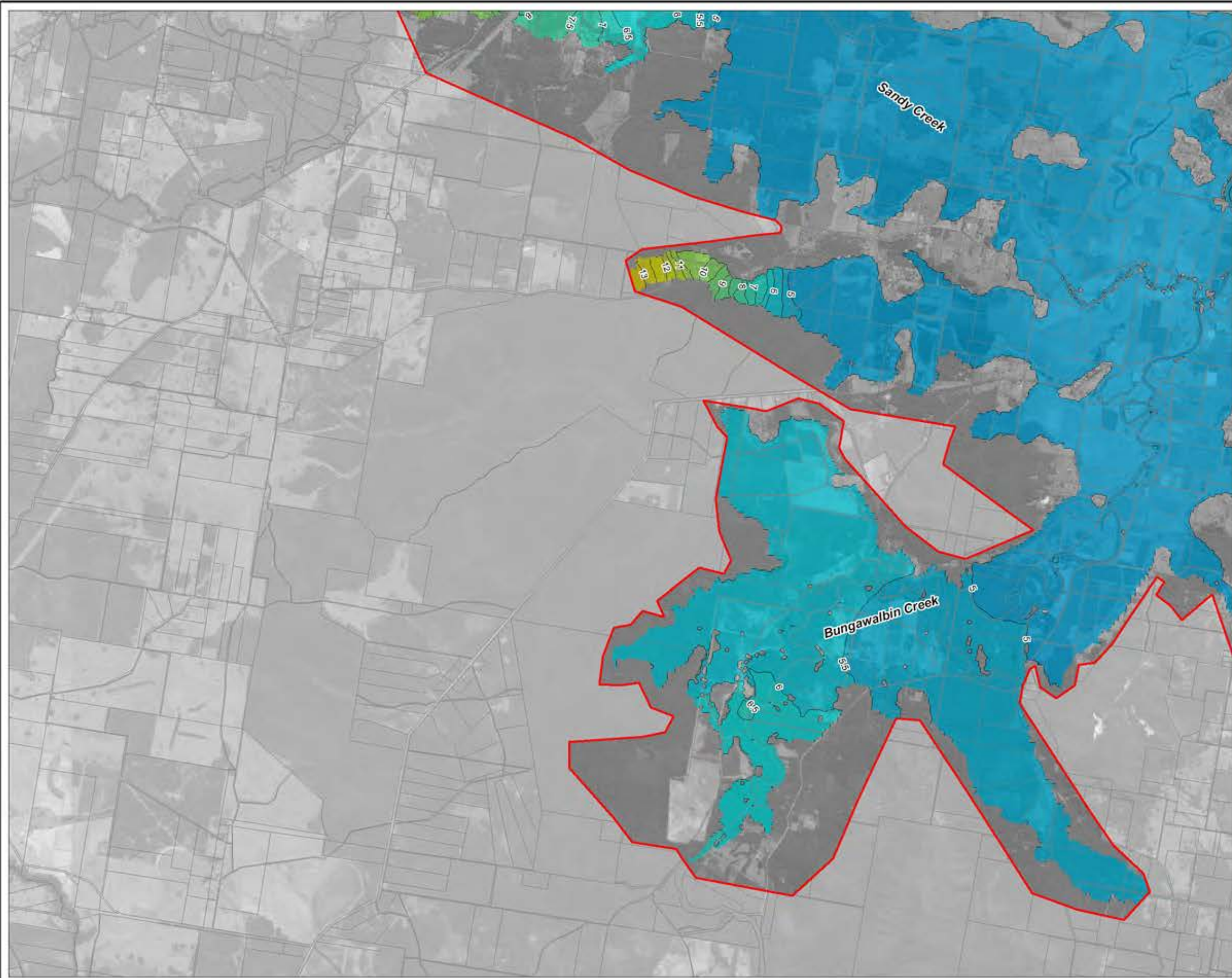
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Map: 5-27
Rev: C

0 2 4km
 Approx. Scale

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LEGEND

Modelled Flood Levels (mAHD)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1974 Peak Flood Levels - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

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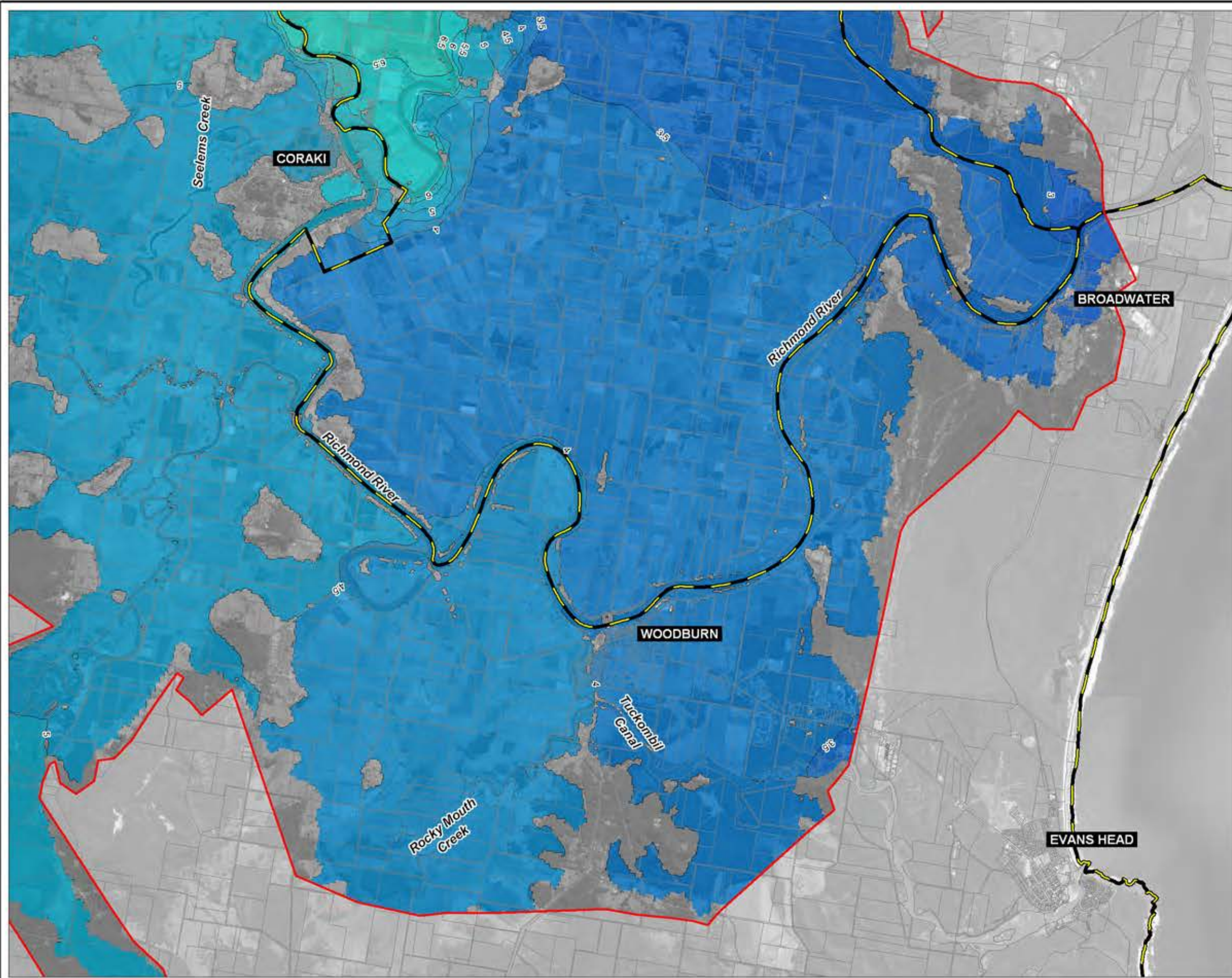


Map:
5-28

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_043_100312_1974 Flood Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
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9.5 to 10.0
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11.0 to 11.5
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13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1974 Peak Flood Levels - Sheet 4
 Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

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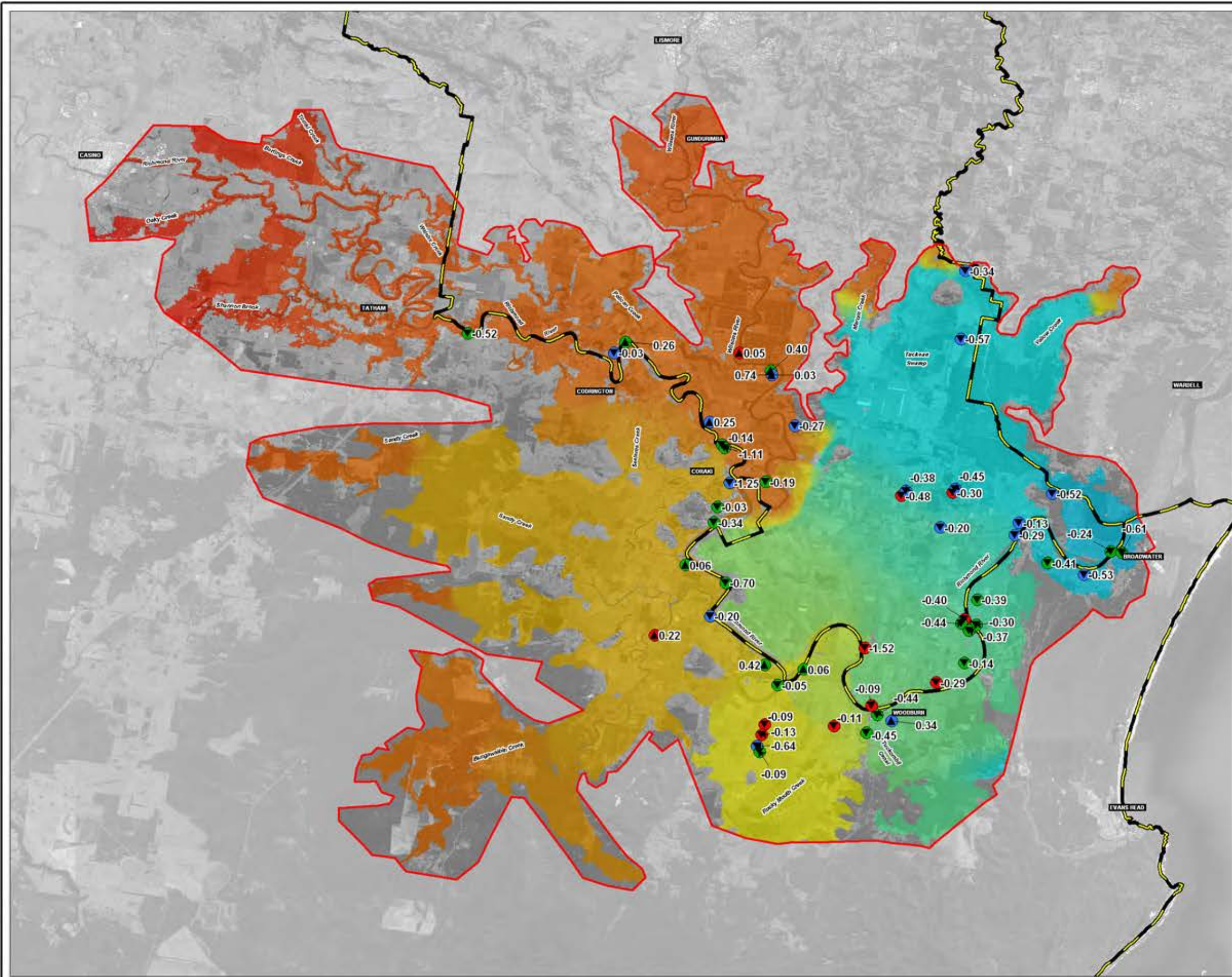


Map:
5-29

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_043_100312_1974 Flood Levels_RevC.wor



LEGEND

Modelled Flood Levels (mAHD)

30.00
20.00
15.00
10.00
5.00
0.00

Flood Depth Mapping Extent

Local Council Boundary

Model Above Recorded Level

Model Below Recorded Level

High Reliability (Red dot)

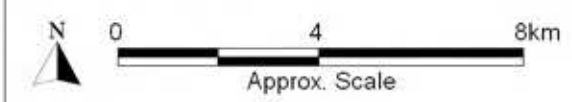
Medium Reliability (Green dot)

Low Reliability (Blue dot)



Title:
1974 Verification Summary

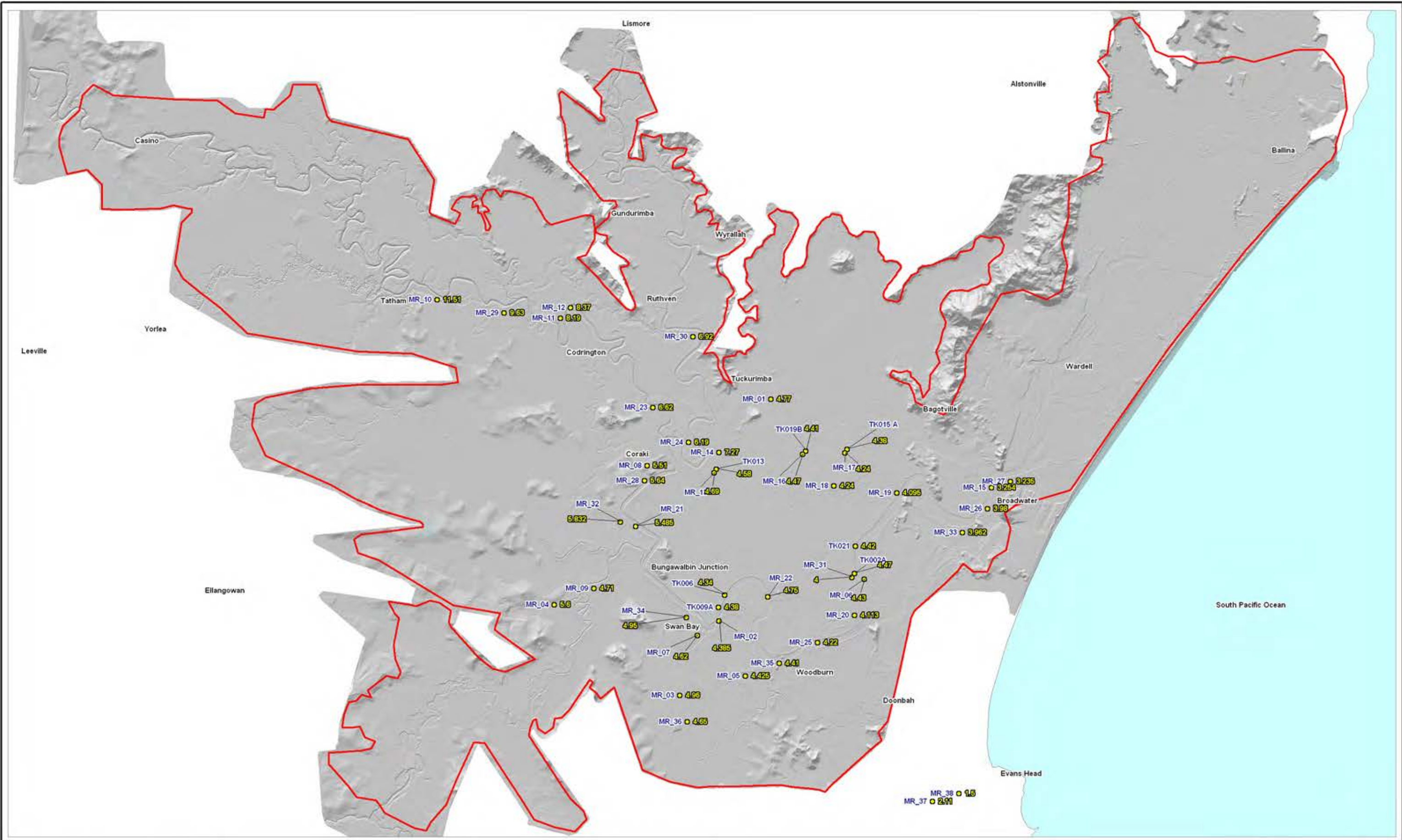
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Map:
5-30

Rev:
C

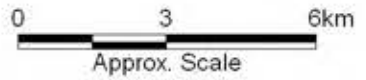




- LEGEND**
- 2D Modelling Extent
 - 1954 Flood Marks
 - 14 Mark Number
 - 4.48 Flood Levels

Title:
1954 Verification Data

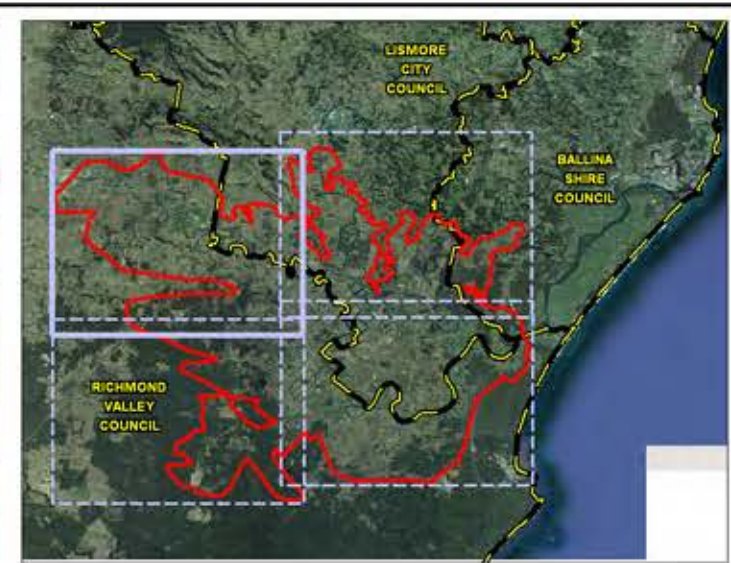
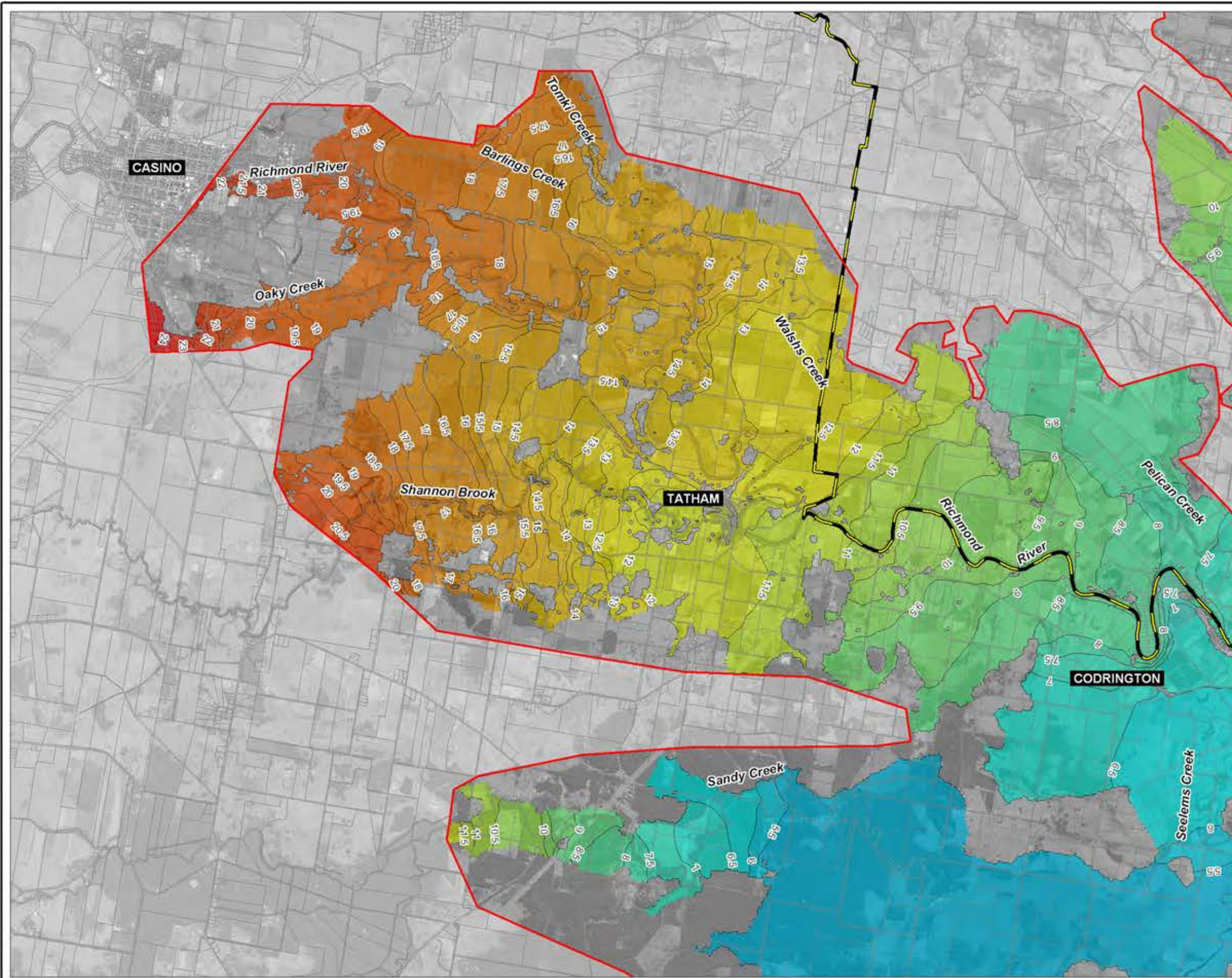
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Map: **5-31** Rev: **B**



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_042_091030 1954 Verification Data.wor



LEGEND

Modelled Flood Levels (mAHd)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1954 Peak Flood Levels - Sheet 1
 Richmond River (Casino to Codrington) and Deep Creek

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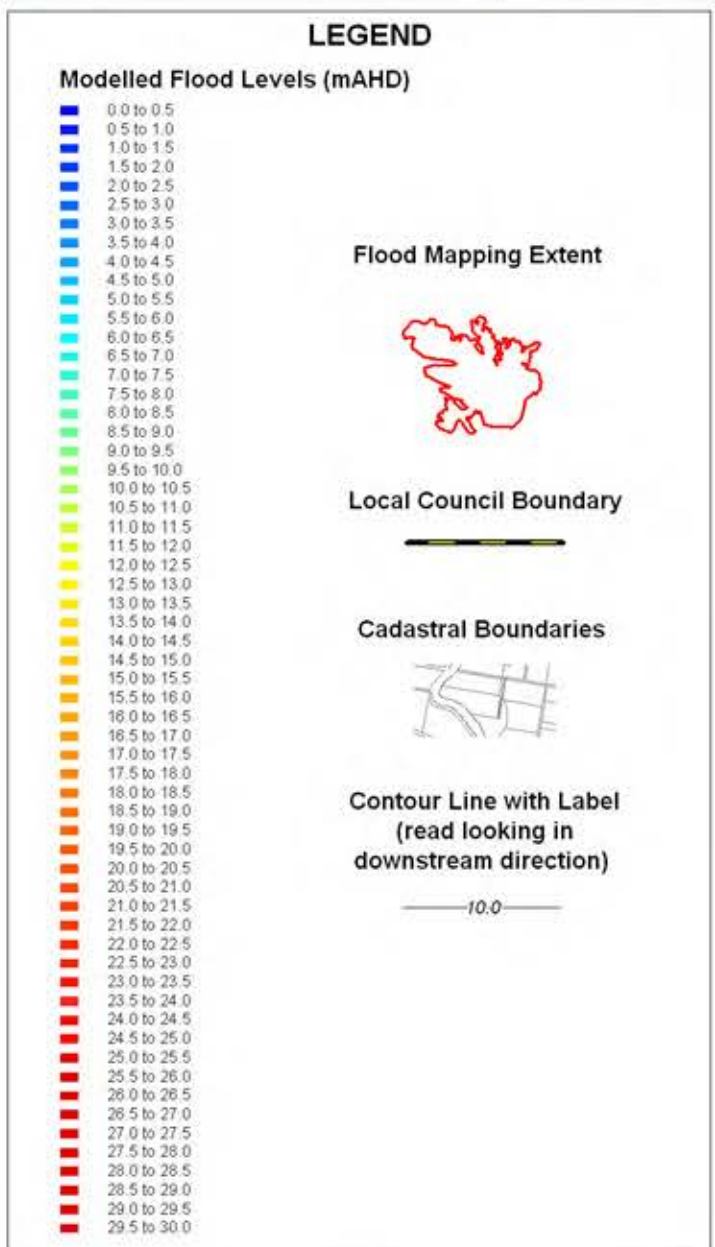
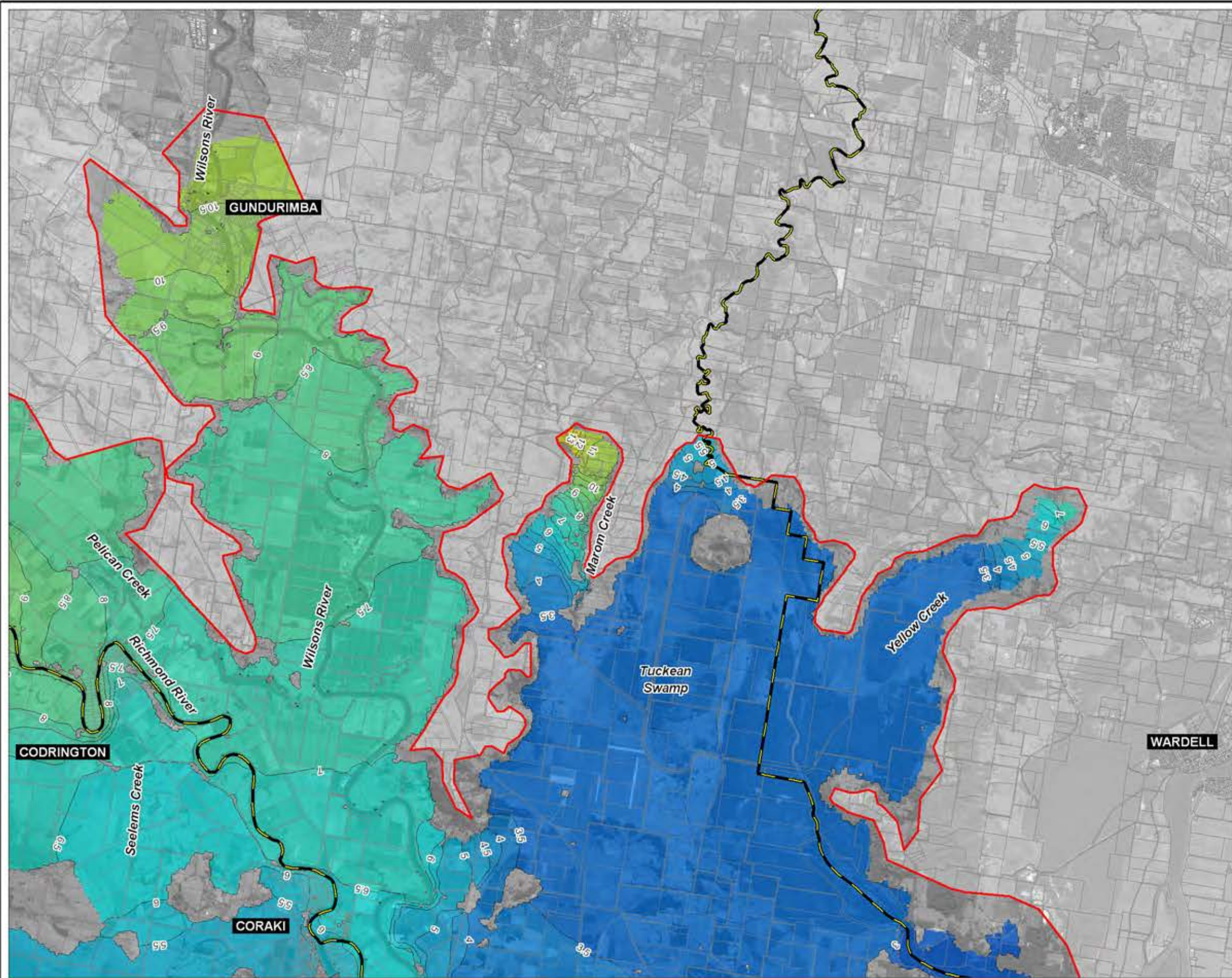


Map:
5-32

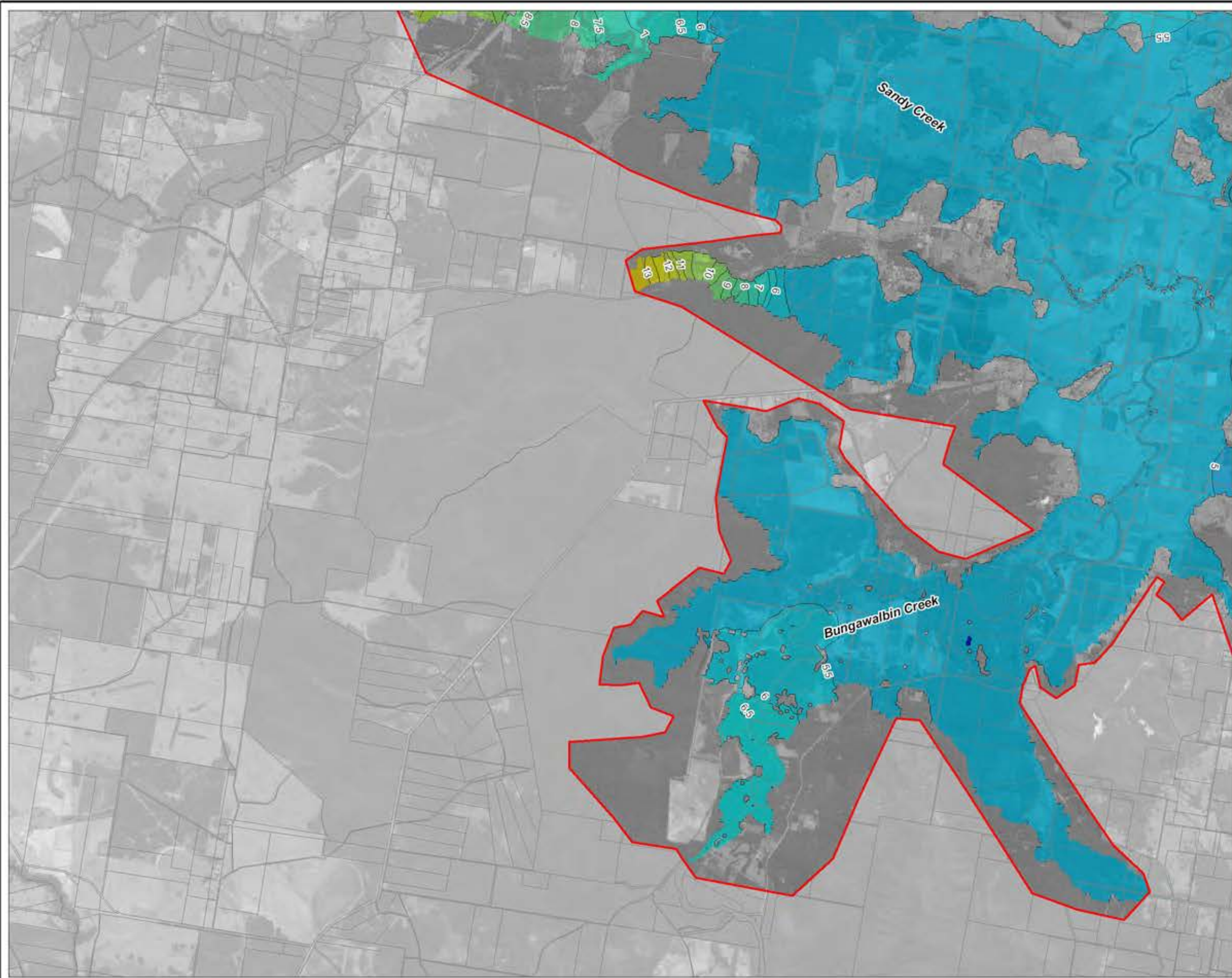
Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_045_100312 1954 Flood Levels_RevC.WOR



Title: 1954 Flood Peak Levels - Sheet 2 Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp		Map: 5-33	Rev: C
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<small>Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_045_100312 1954 Flood Levels_RevC.WOR</small>			
		www.wbmpl.com.au	



LEGEND

Modelled Flood Levels (mAHd)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1954 Peak Flood Levels - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

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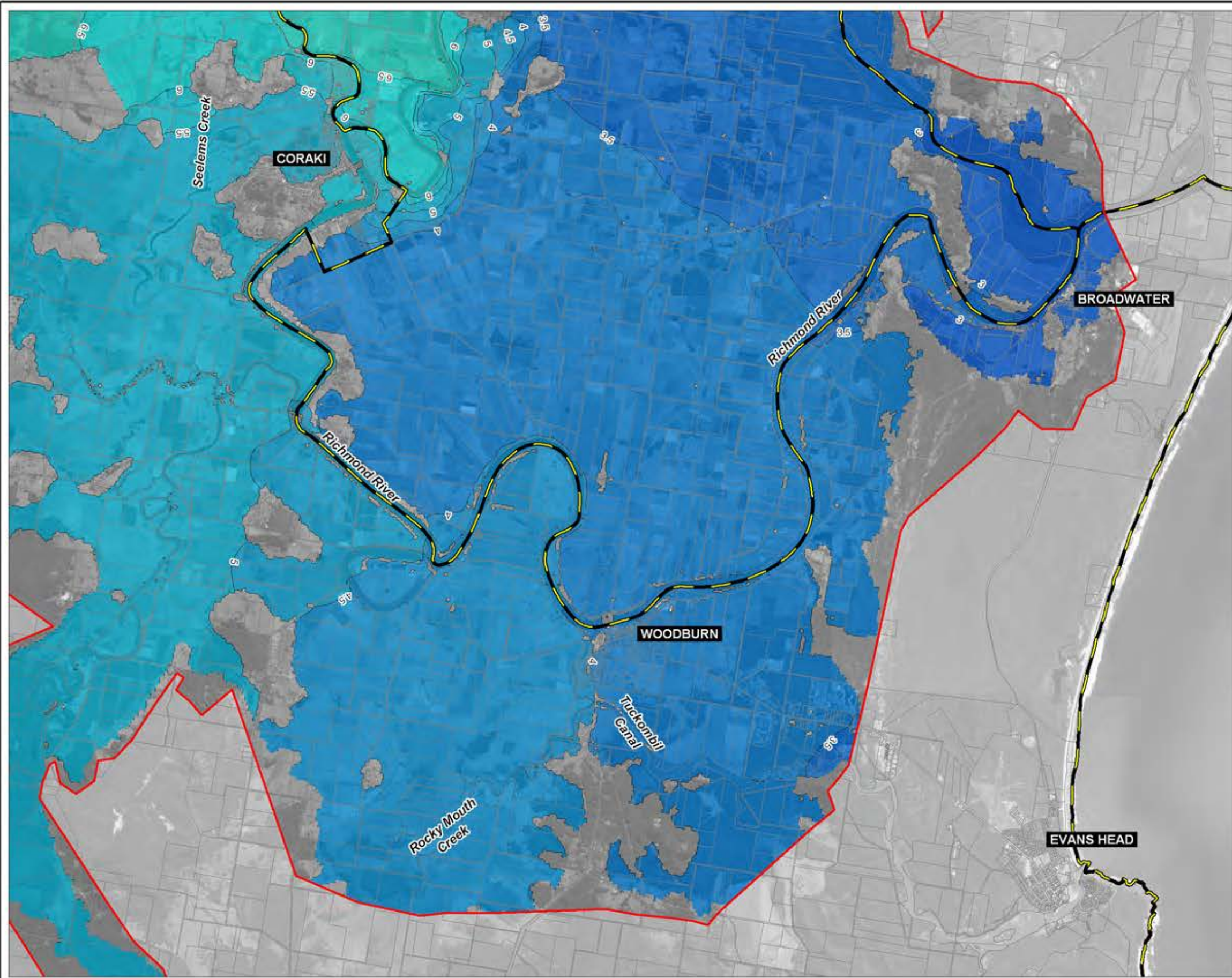


Map:
5-34

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_045_100312 1954 Flood Levels_RevC.WOR



LEGEND

Modelled Flood Levels (mAHD)

0.0 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
2.0 to 2.5
2.5 to 3.0
3.0 to 3.5
3.5 to 4.0
4.0 to 4.5
4.5 to 5.0
5.0 to 5.5
5.5 to 6.0
6.0 to 6.5
6.5 to 7.0
7.0 to 7.5
7.5 to 8.0
8.0 to 8.5
8.5 to 9.0
9.0 to 9.5
9.5 to 10.0
10.0 to 10.5
10.5 to 11.0
11.0 to 11.5
11.5 to 12.0
12.0 to 12.5
12.5 to 13.0
13.0 to 13.5
13.5 to 14.0
14.0 to 14.5
14.5 to 15.0
15.0 to 15.5
15.5 to 16.0
16.0 to 16.5
16.5 to 17.0
17.0 to 17.5
17.5 to 18.0
18.0 to 18.5
18.5 to 19.0
19.0 to 19.5
19.5 to 20.0
20.0 to 20.5
20.5 to 21.0
21.0 to 21.5
21.5 to 22.0
22.0 to 22.5
22.5 to 23.0
23.0 to 23.5
23.5 to 24.0
24.0 to 24.5
24.5 to 25.0
25.0 to 25.5
25.5 to 26.0
26.0 to 26.5
26.5 to 27.0
27.0 to 27.5
27.5 to 28.0
28.0 to 28.5
28.5 to 29.0
29.0 to 29.5
29.5 to 30.0

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

Contour Line with Label (read looking in downstream direction)



Title:
1954 Peak Flood Levels - Sheet 4
 Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

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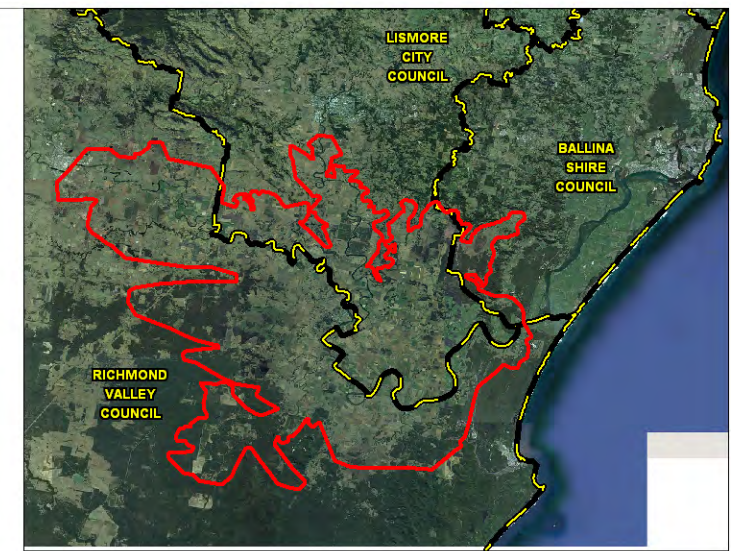
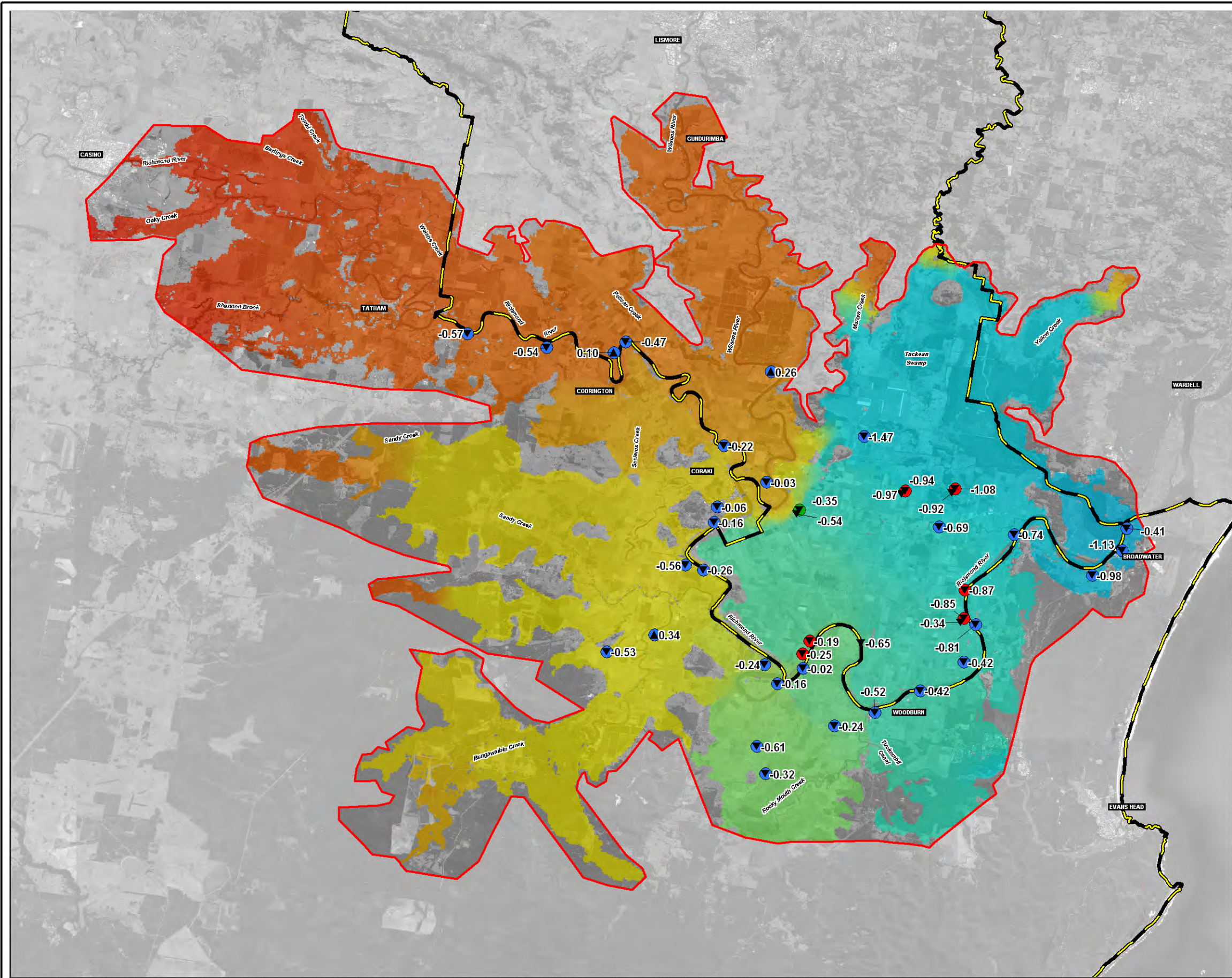


Map:
5-35

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_045_100312 1954 Flood Levels_RevC.WOR



LEGEND

Modelled Flood Levels (mAHd)

30.00
20.00
15.00
10.00
5.00
0.00

Flood Depth Mapping Extent

Local Council Boundary

Model Above Recorded Level

Model Below Recorded Level

High Reliability

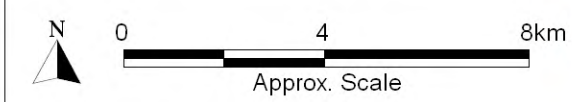
Medium Reliability

Low Reliability



Title:
1954 Verification Summary

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Map:
5-36

Rev:
B





LEGEND

-  IFD Regions Based on Sub-Catchment Boundaries
-  Waterways

Title:

Intensity-Frequency-Duration Regions

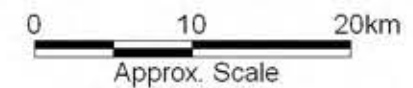
Map:

6-1

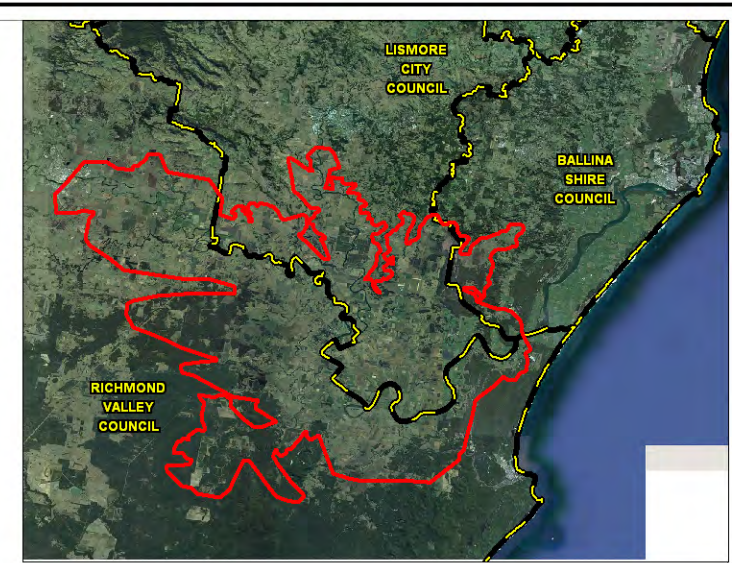
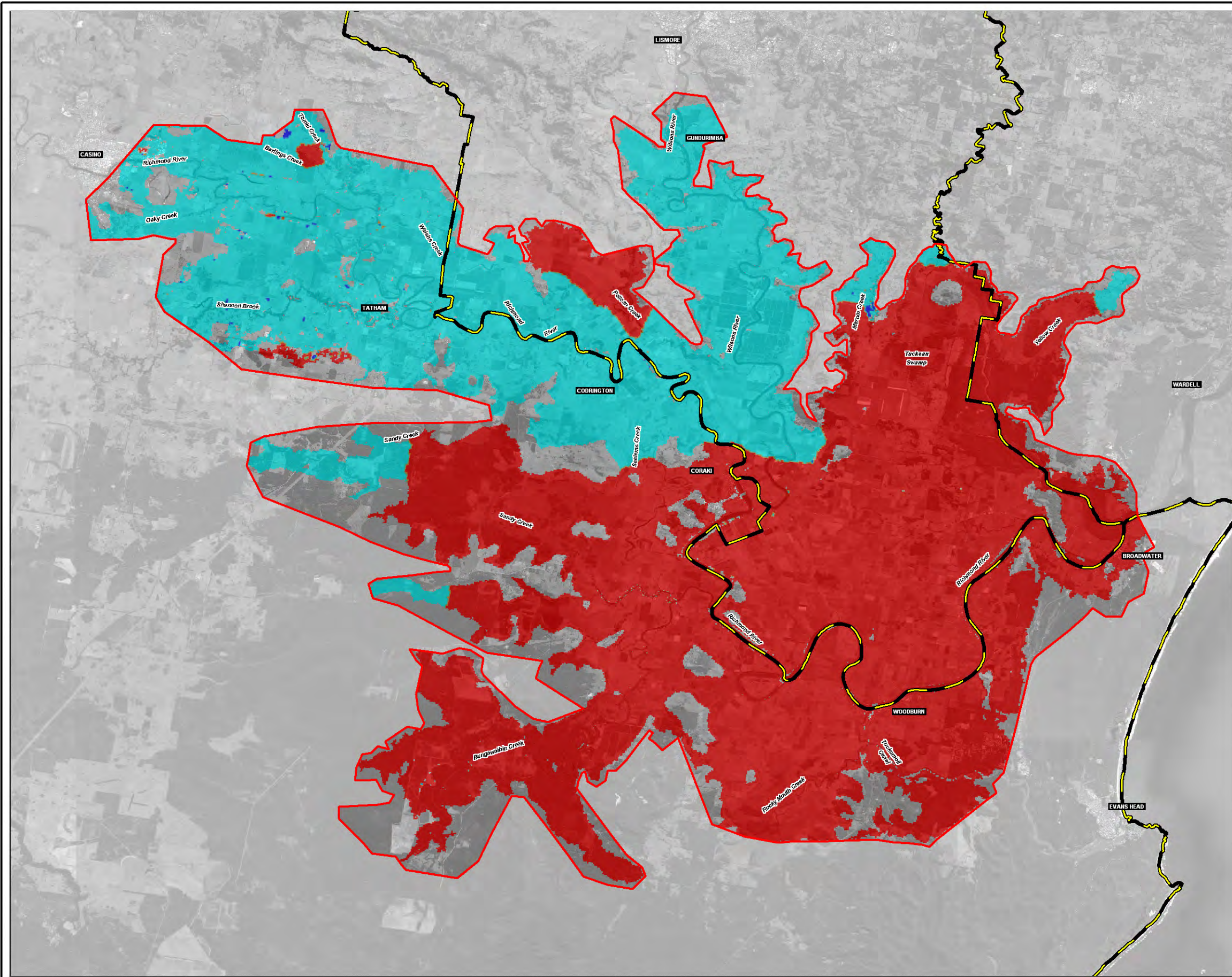
Rev:

A






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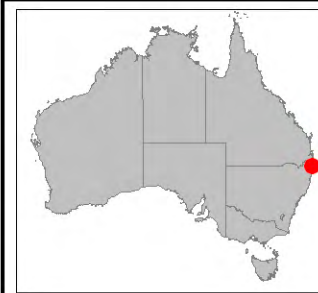


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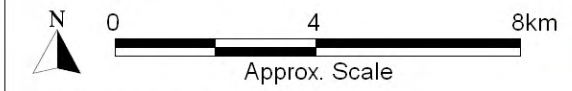
Critical Event Duration	Flood Depth Mapping Extent
 36 Hour	
 48 Hour	Local Council Boundary
 72 Hour	



1. Actual flood events can significantly differ from the design flood events presented here. The flood behaviour shown is predicted to occur during a typical design flood event, under the physical and topographic conditions prevailing at the time of preparation.
2. The approximate extent of land liable to flooding is based on survey data available at the time of preparation. Refer to Volume 1 of the Richmond River Flood Mapping Study for details of the survey data used.
3. Local flooding of other areas, or in excess of the levels shown, may occur. The extent of flooding shown relates primarily to long duration rainfall events. Shorter duration events leading to flash flooding may result in higher localised flood levels and velocities in some areas.
4. Local increases in flood levels, depths, and/or velocities from those shown may result from local factors such as full or partial blockages of drainage structures, and obstructions to overland flows such as changes to agricultural characteristics, farm levees and drains, fences and buildings.

Title:
100 Year ARI Critical Event Duration

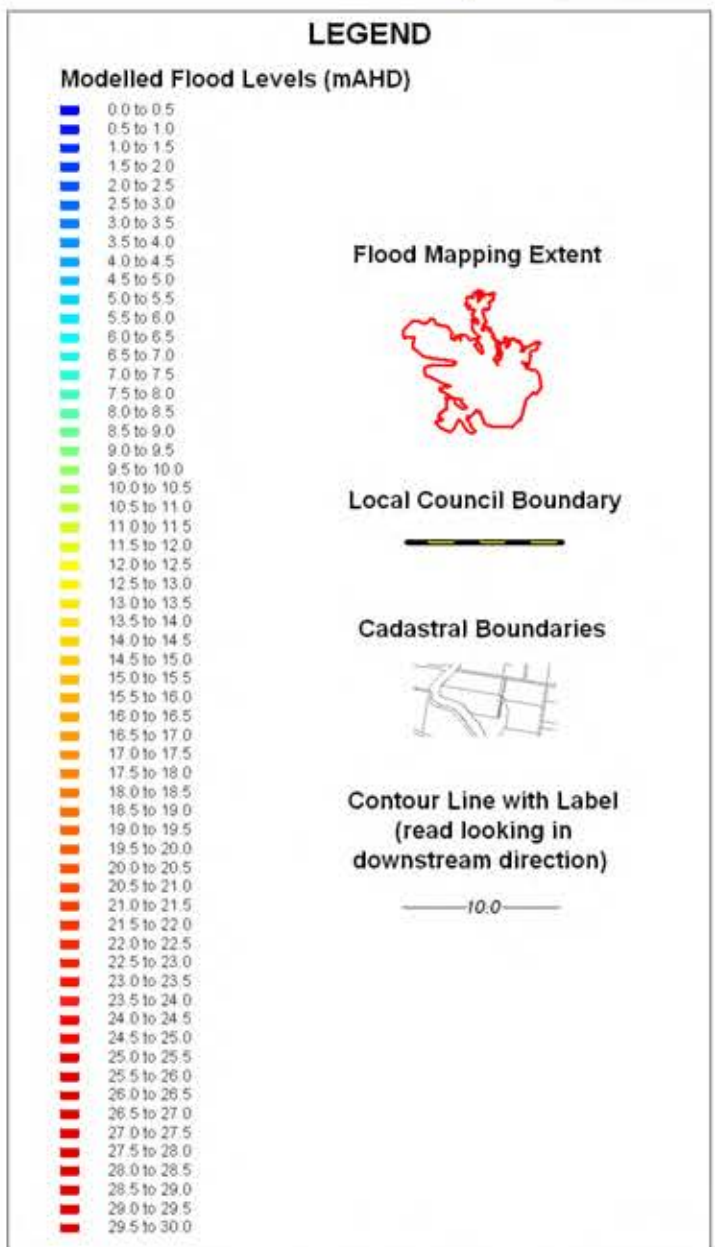
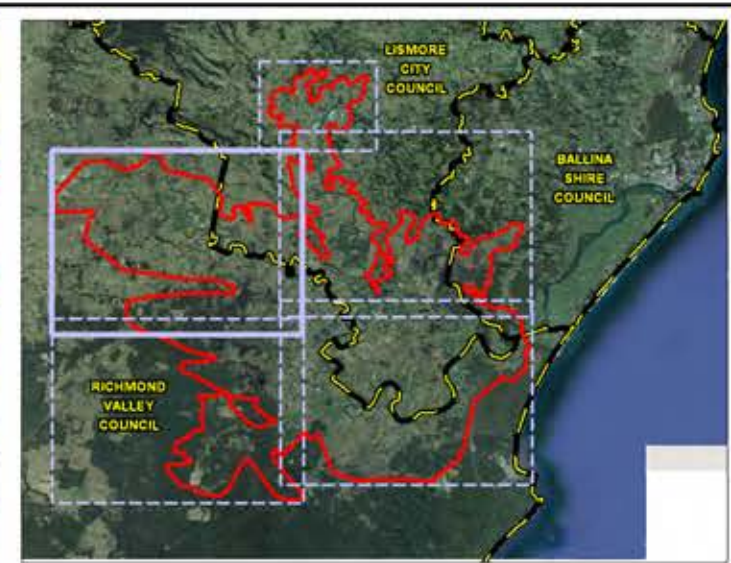
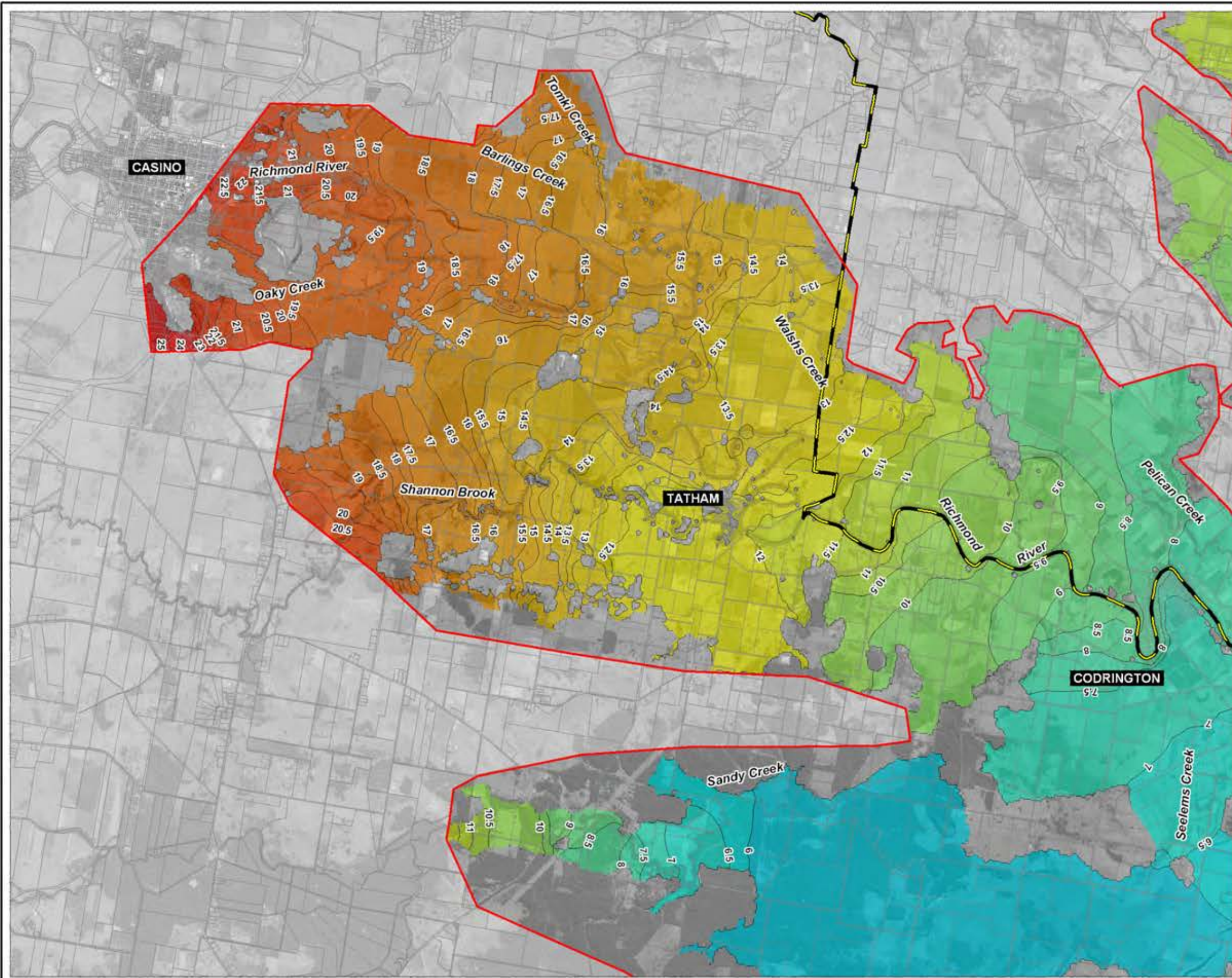
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Map:	Rev:
6-2	B



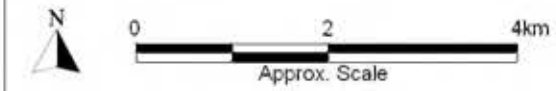
Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_066_100207 100yr_Critical_Event_Duration.wor



1. Actual flood events can significantly differ from the design flood events presented here. The flood behaviour shown is predicted to occur during a typical design flood event, under the physical and topographic conditions prevailing at the time of preparation.
2. The approximate extent of land liable to flooding is based on survey data available at the time of preparation. Refer to Volume 1 of the Richmond River Flood Mapping Study for details of the survey data used.
3. Local flooding of other areas, or in excess of the levels shown, may occur. The extent of flooding shown relates primarily to long duration rainfall events. Shorter duration events leading to flash flooding may result in higher localised flood levels and velocities in some areas.
4. Local increases in flood levels, depths, and/or velocities from those shown may result from local factors such as full or partial blockages of drainage structures, and obstructions to overland flows such as changes to agricultural characteristics, farm levees and drains, fences and buildings.

Title:
100 Year ARI Peak Flood Levels - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

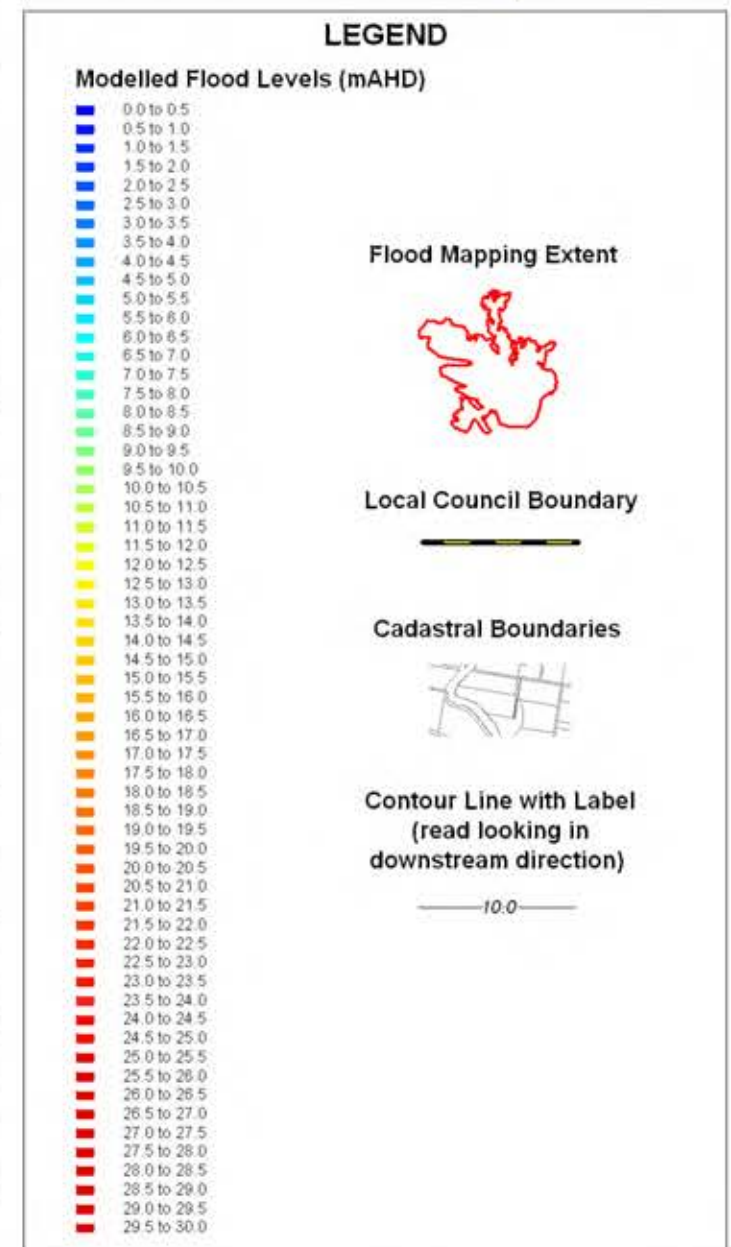
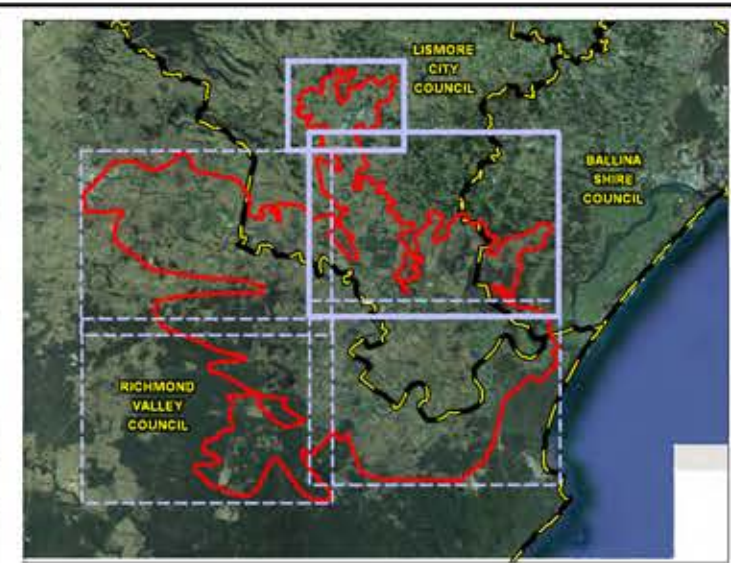
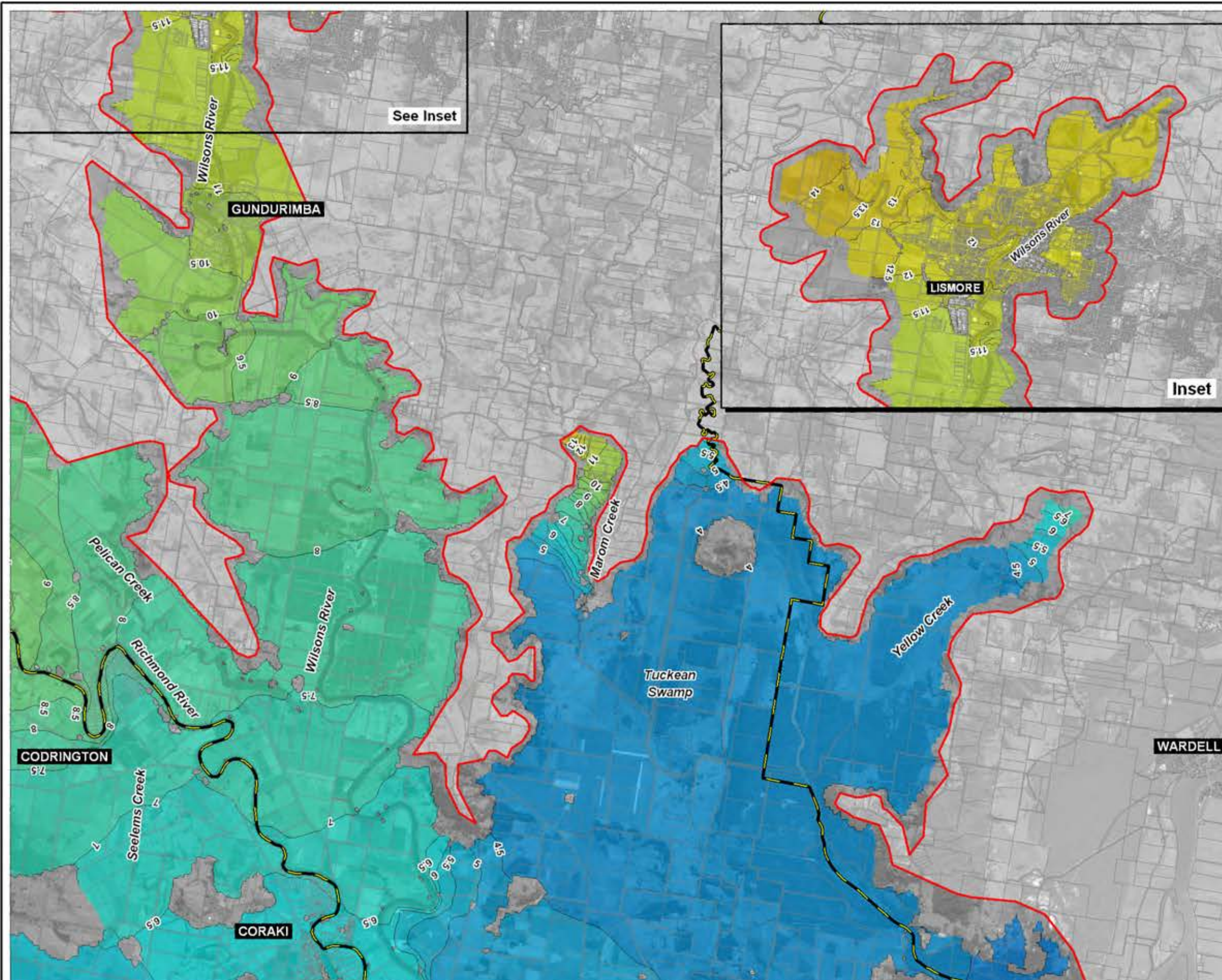
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Map: **6-3** Rev: **C**



Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRG\FLD_058_100311_O100yr_Levels_RevC.wor



1. Actual flood events can significantly differ from the design flood events presented here. The flood behaviour shown is predicted to occur during a typical design flood event, under the physical and topographic conditions prevailing at the time of preparation.
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4. Local increases in flood levels, depths, and/or velocities from those shown may result from local factors such as full or partial blockages of drainage structures, and obstructions to overland flows such as changes to agricultural characteristics, farm levees and drains, fences and buildings.
5. The results presented for the Lismore area (approximately defined by the inset), are taken from the Lismore Flood Study (Patterson Britton, 2002).

Title:
100 Year ARI Peak Flood Levels - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

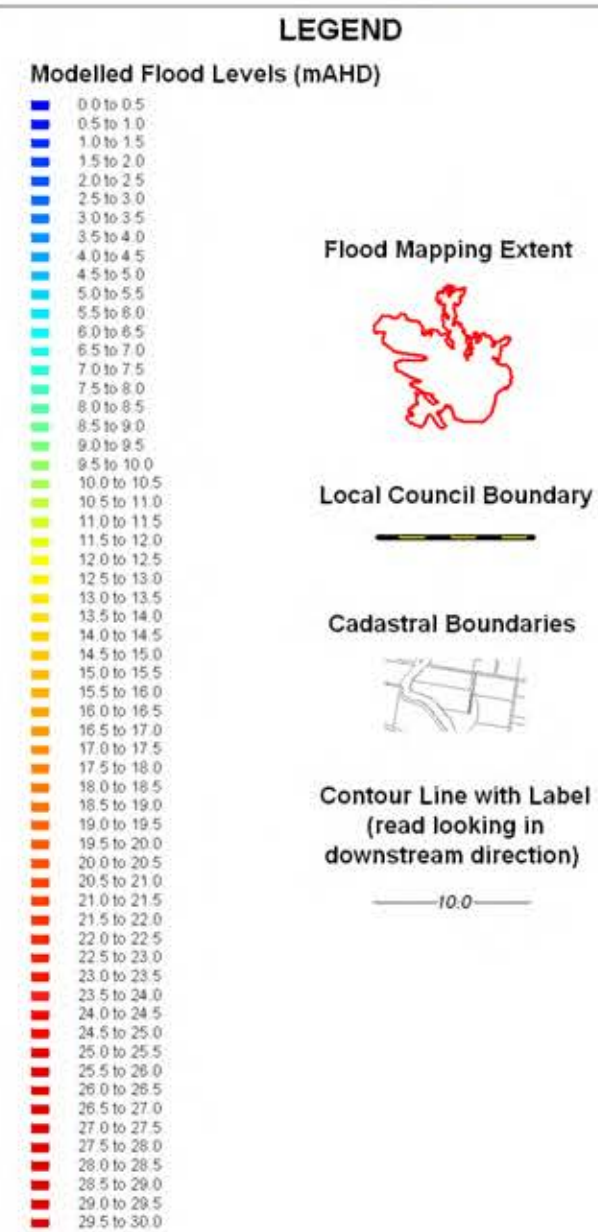
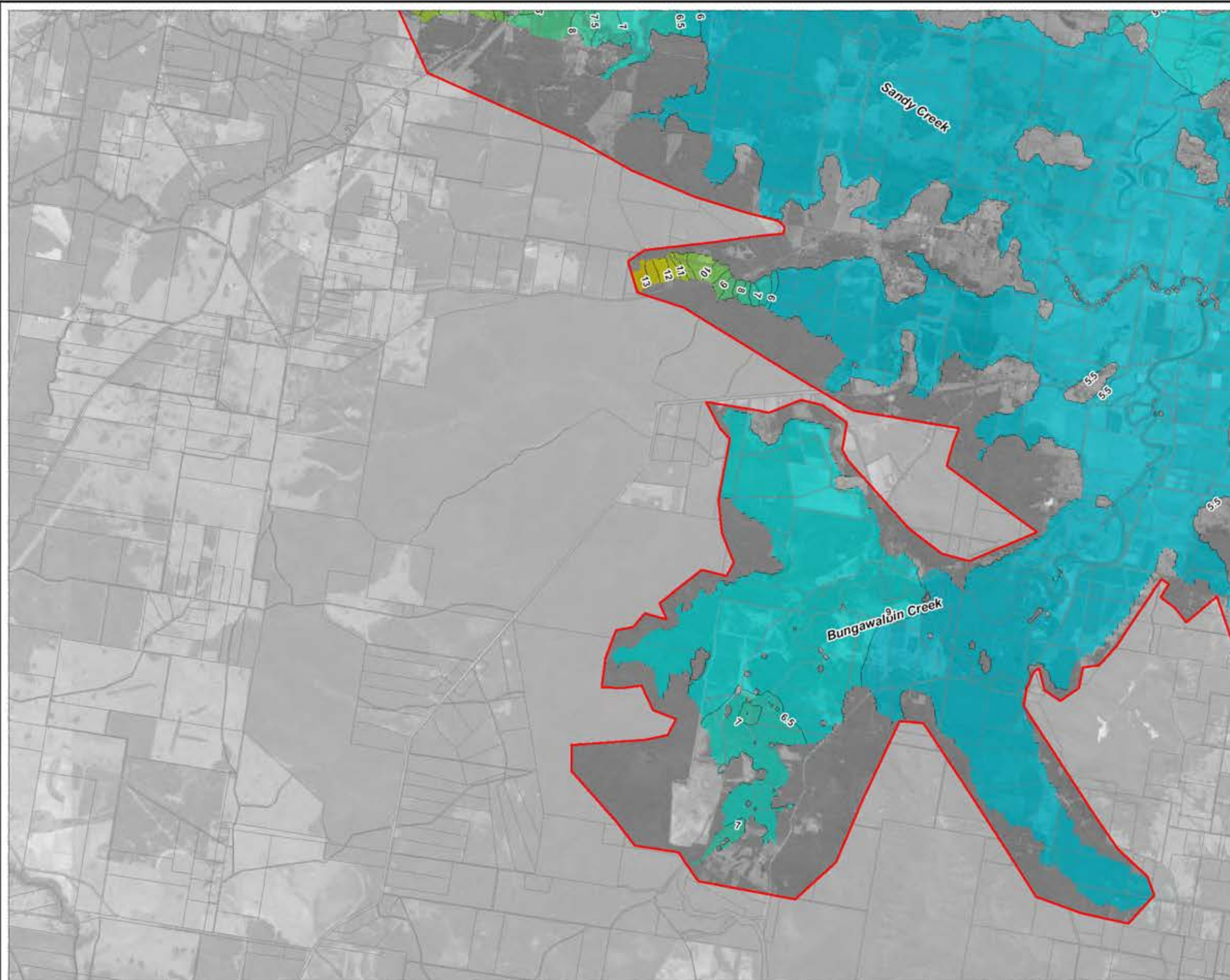
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Map: **6-4** Rev: **C**



Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRG\FLD_058_100311_Q100yr_Levels_RevC.wor



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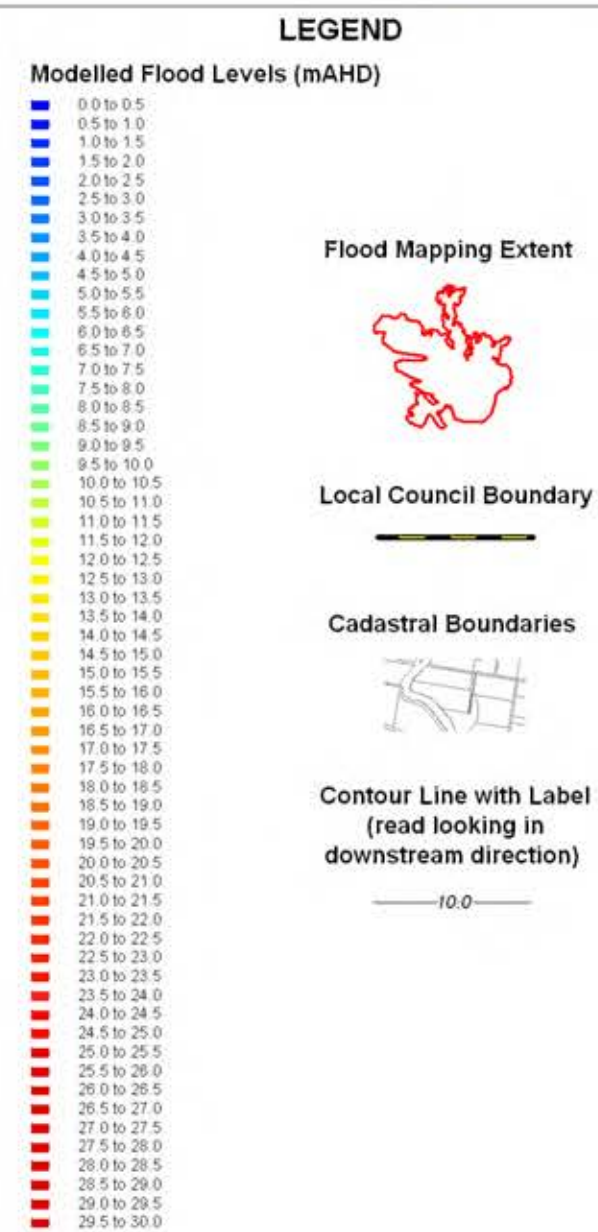
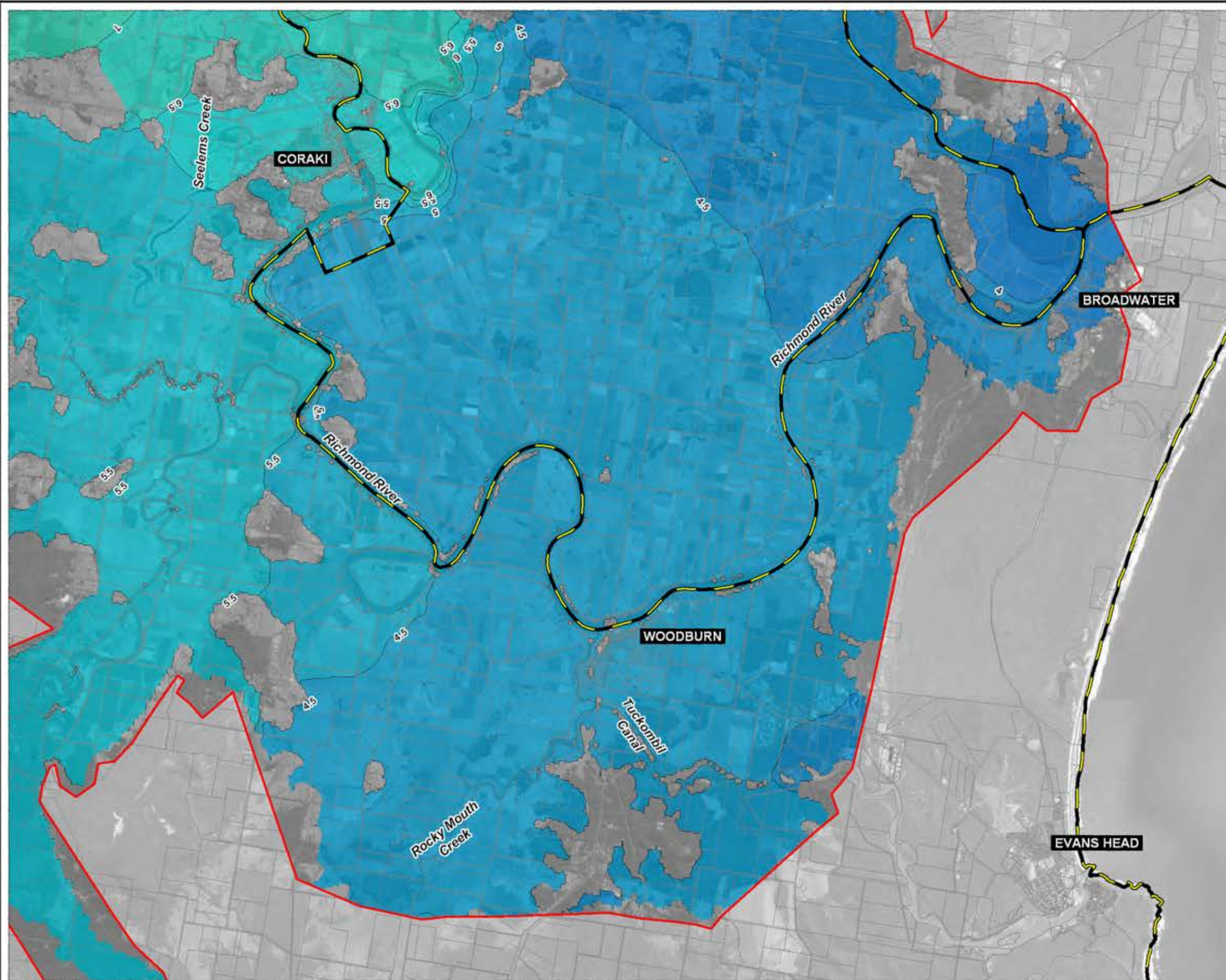
Title:
100 Year ARI Peak Flood Levels - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

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Map: 6-5
 Rev: C





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Title:
100 Year ARI Peak Flood Levels - Sheet 4
Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

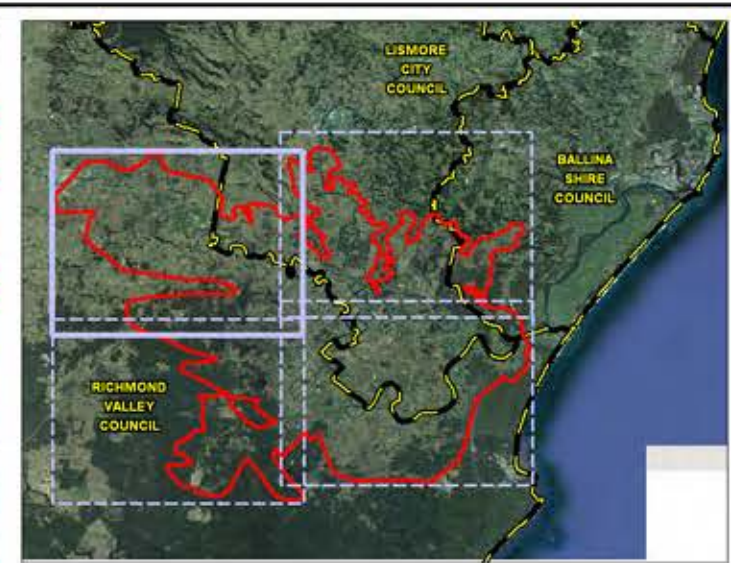
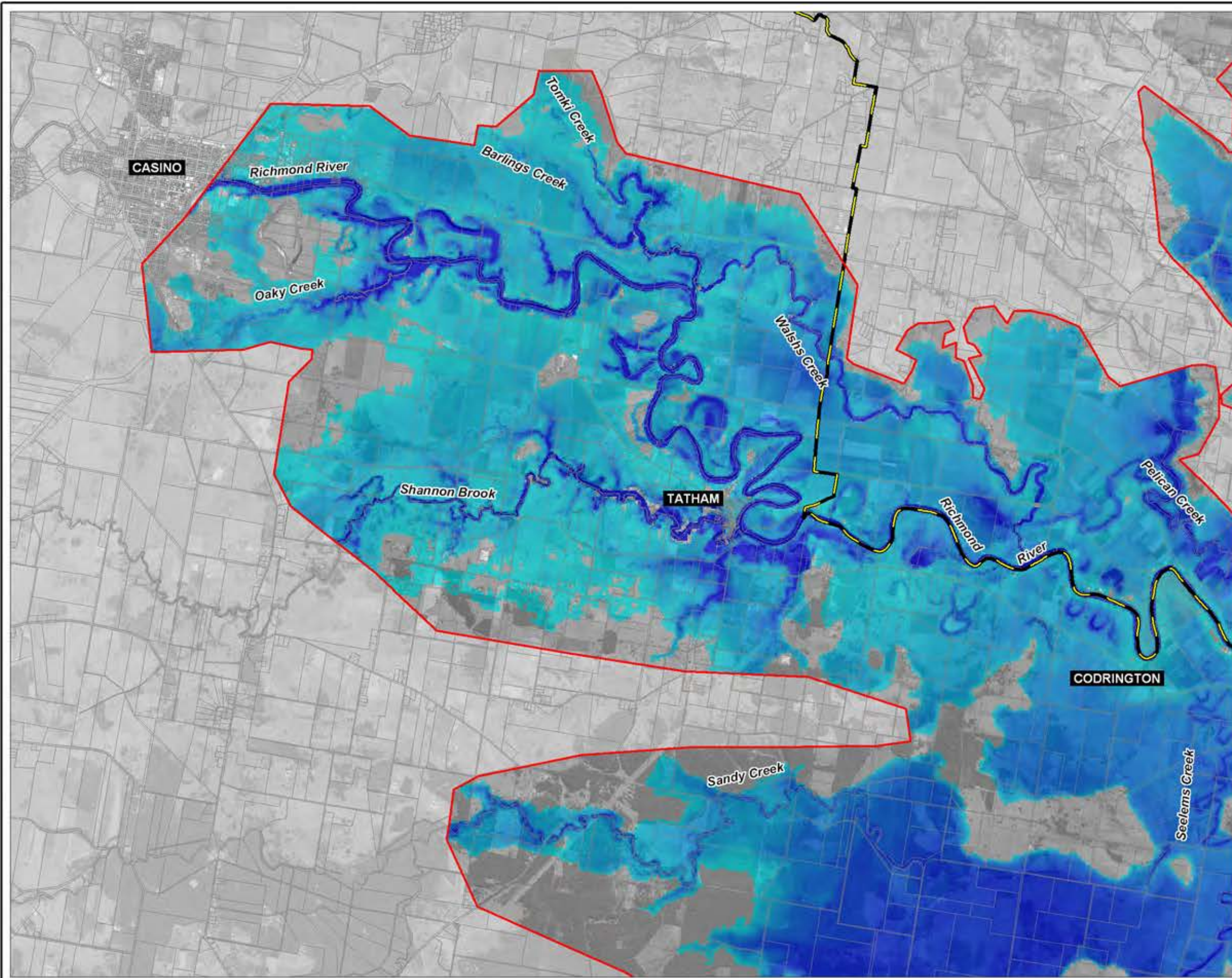
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Map: 6-6
 Rev: C



Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRG\FLD_058_100311_O100yr_Levels_RevC.wor



LEGEND

Modelled Flood Depth (m)

- > 5.00
- 4.00
- 3.00
- 2.00
- 1.00
- 0.00

Flood Mapping Extent

Local Council Boundary

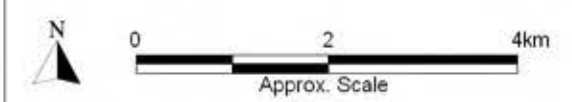
Cadastral Boundaries



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Title:
100 Year ARI Peak Flood Depths - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

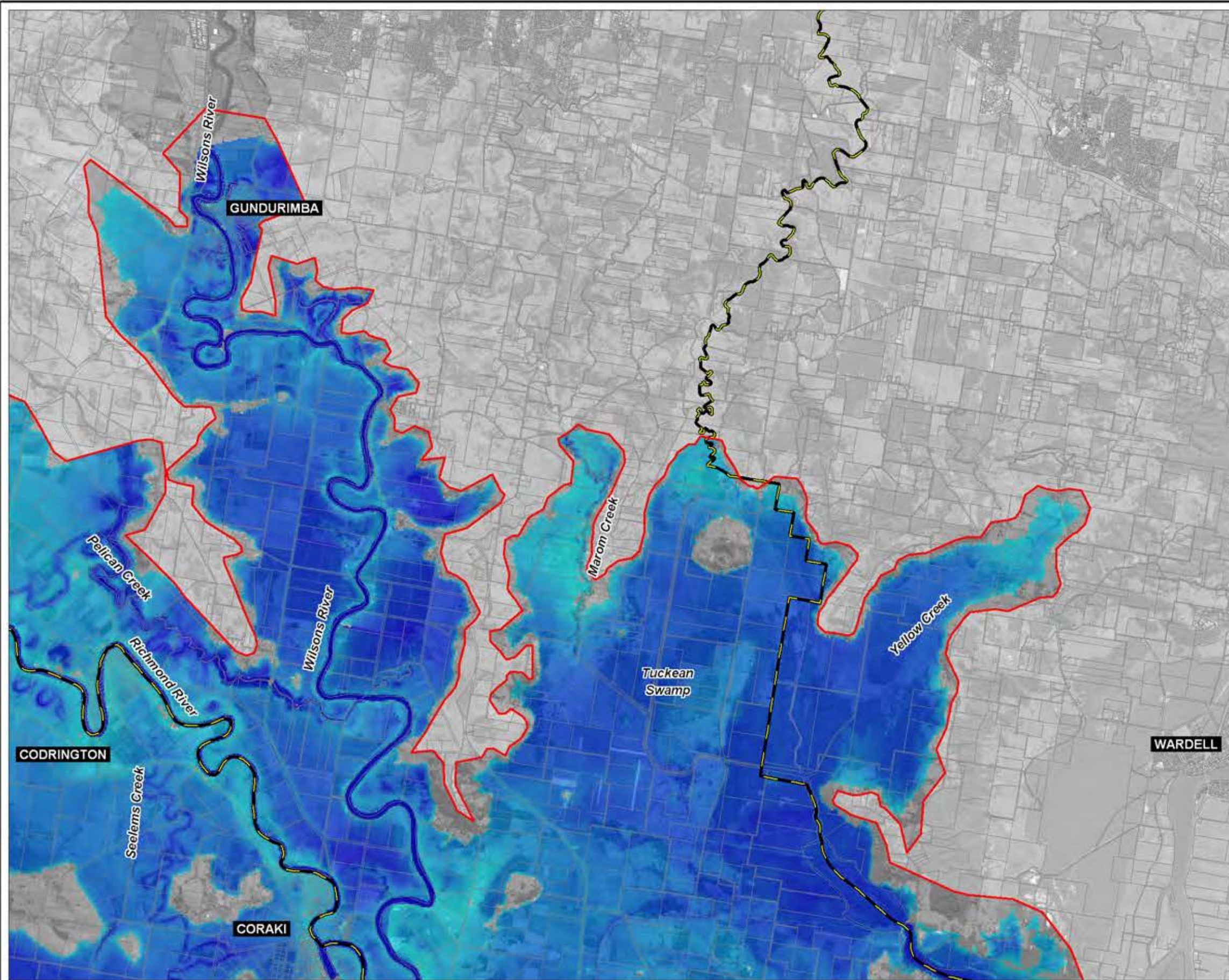
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Map:	Rev:
6-7	C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_050_100311_100yr_Depths_RevC.WOR



LEGEND

Modelled Flood Depth (m)



Flood Mapping Extent



Local Council Boundary



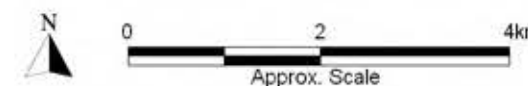
Cadastral Boundaries



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Title:
100 Year ARI Peak Flood Depths - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

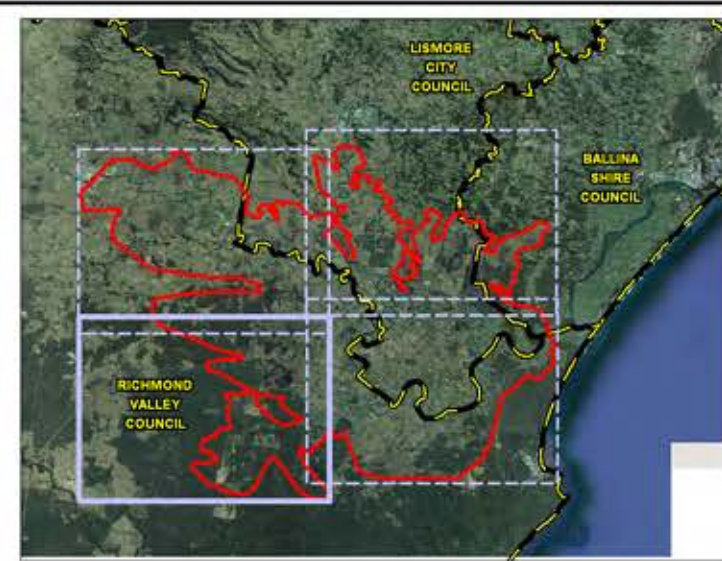
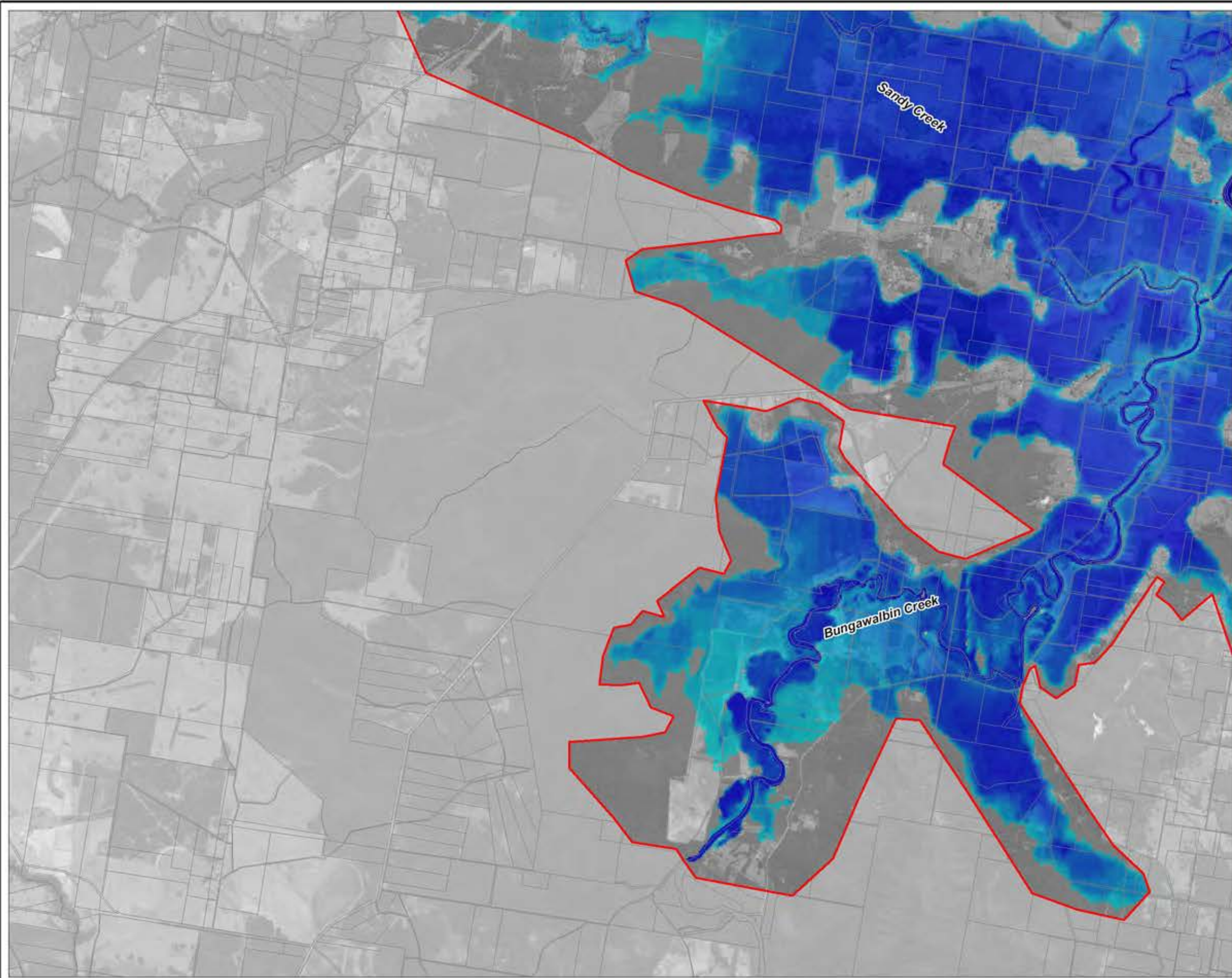
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Map: 6-8
 Rev: C

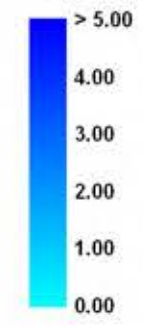


Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_050_100311_100yr_Depths_RevC.WOR



LEGEND

Modelled Flood Depth (m)



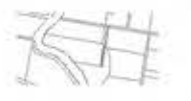
Flood Mapping Extent



Local Council Boundary



Cadastral Boundaries



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Title:
100 Year ARI Peak Flood Depths - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

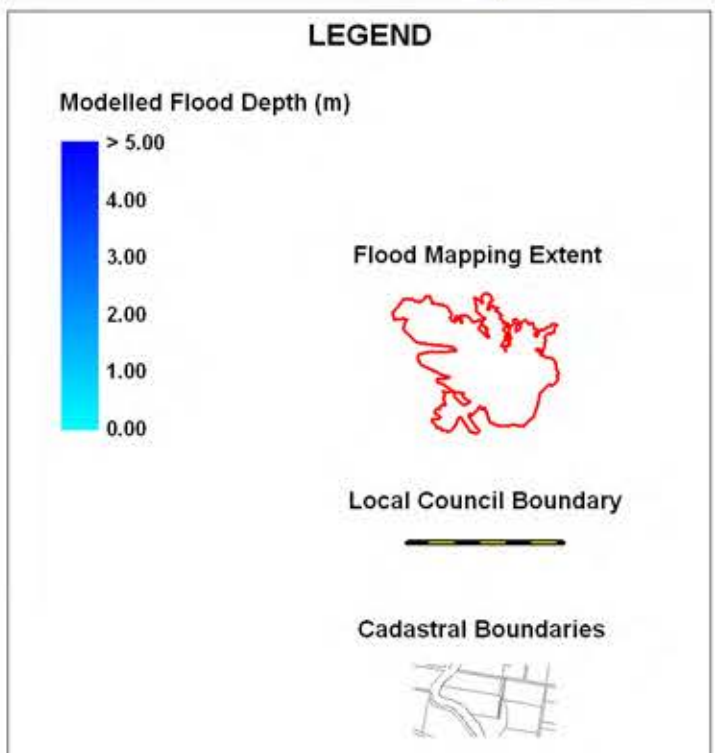
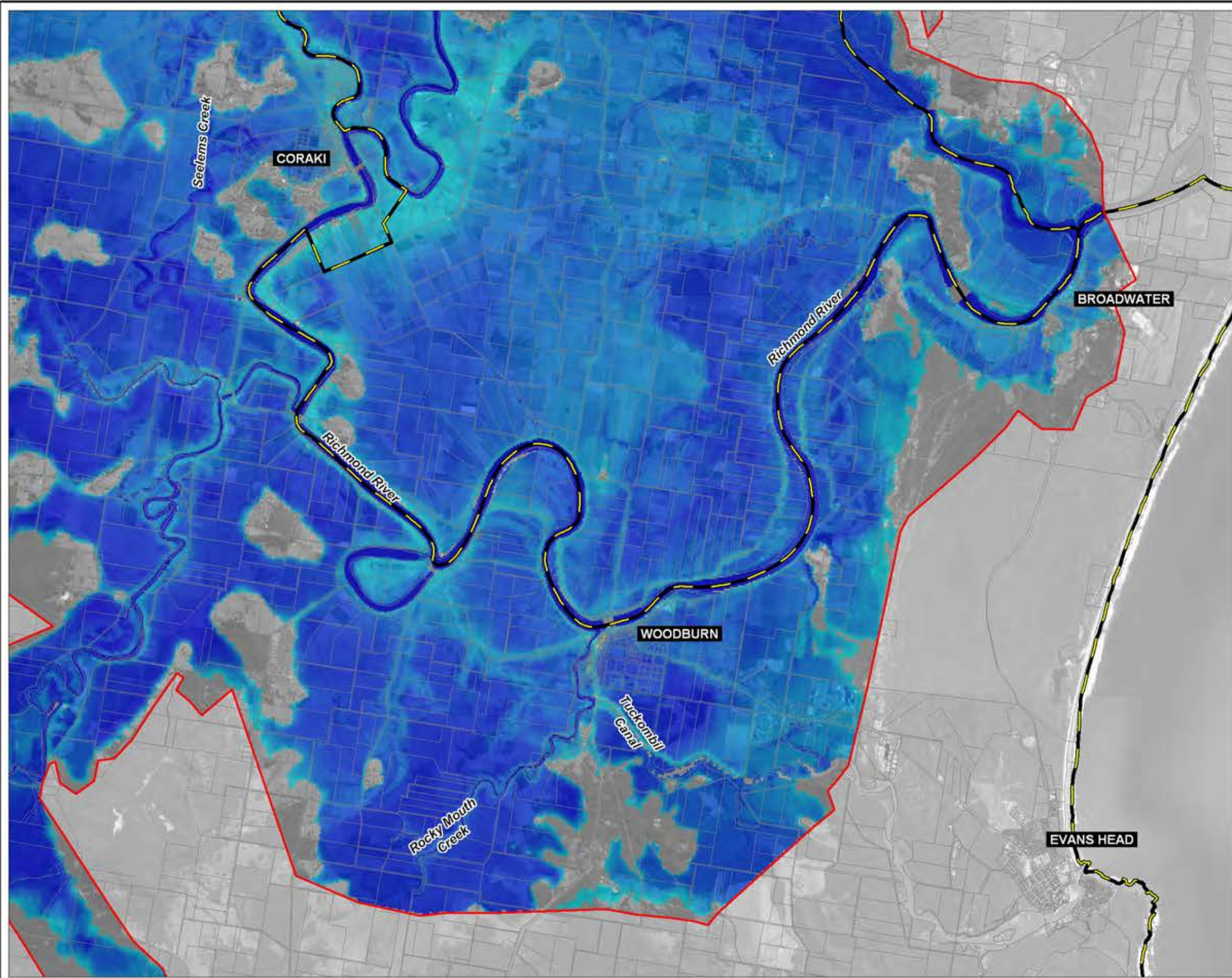
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Map: **6-9** Rev: **C**



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_050_100311_100yr_Depths_RevC.WOR

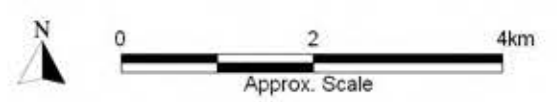


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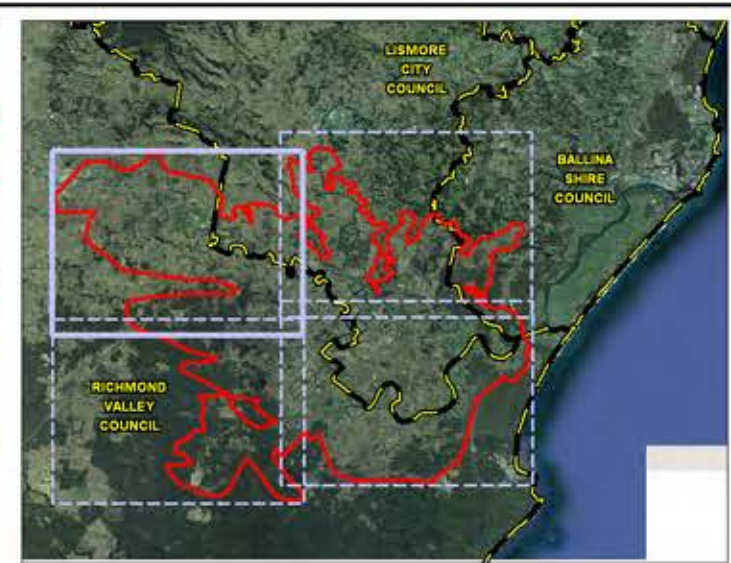
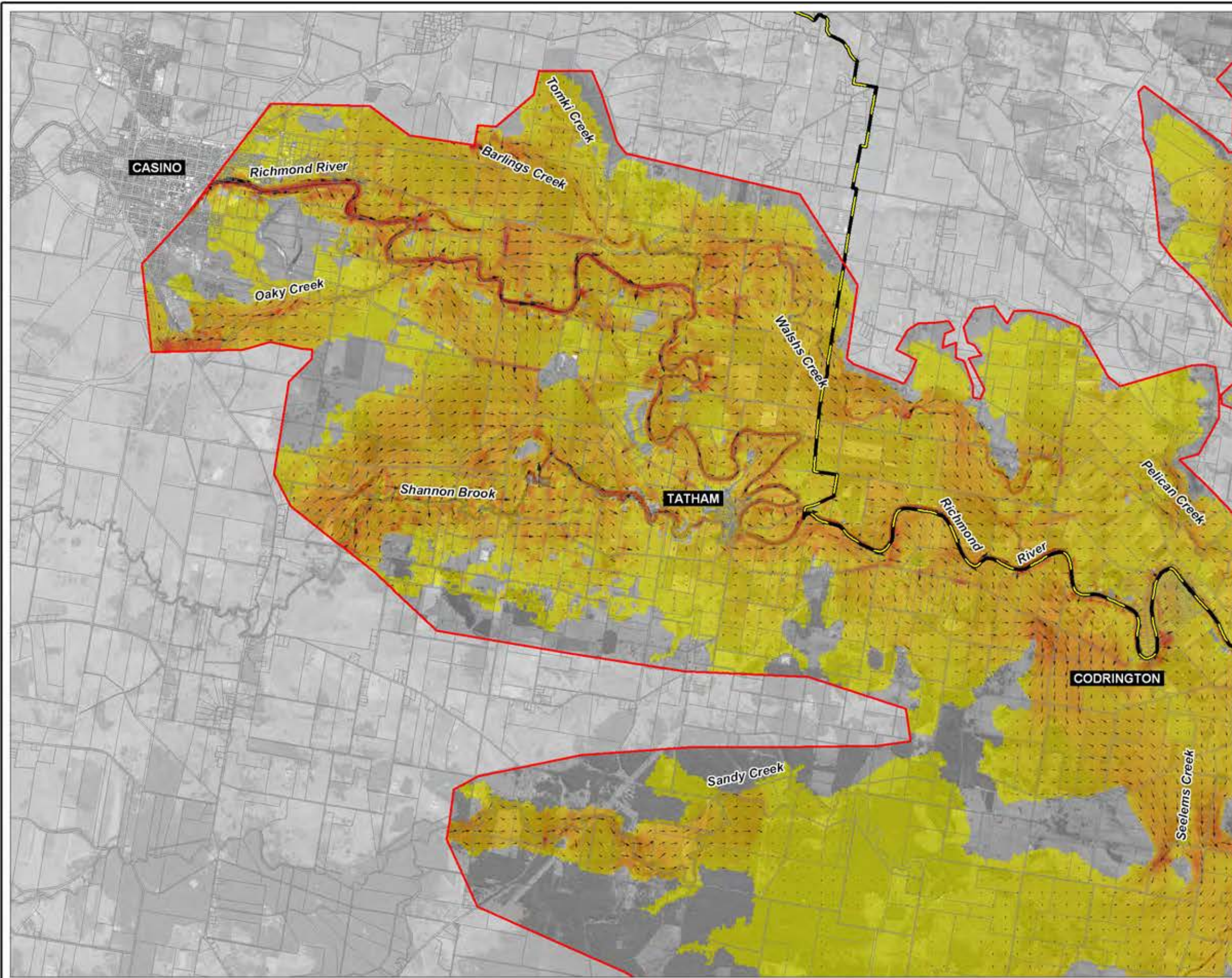
Title:
100 Year ARI Peak Flood Depths - Sheet 4
 Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

Map: 6-10
 Rev: C

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LEGEND

Modelled Flood Velocity (m/s)

Flood Mapping Extent

Local Council Boundary

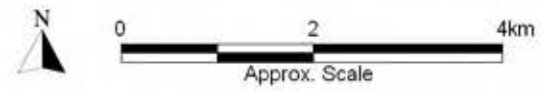
Cadastral Boundaries



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Title:
100 Year ARI Velocity at Peak Flood Level - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

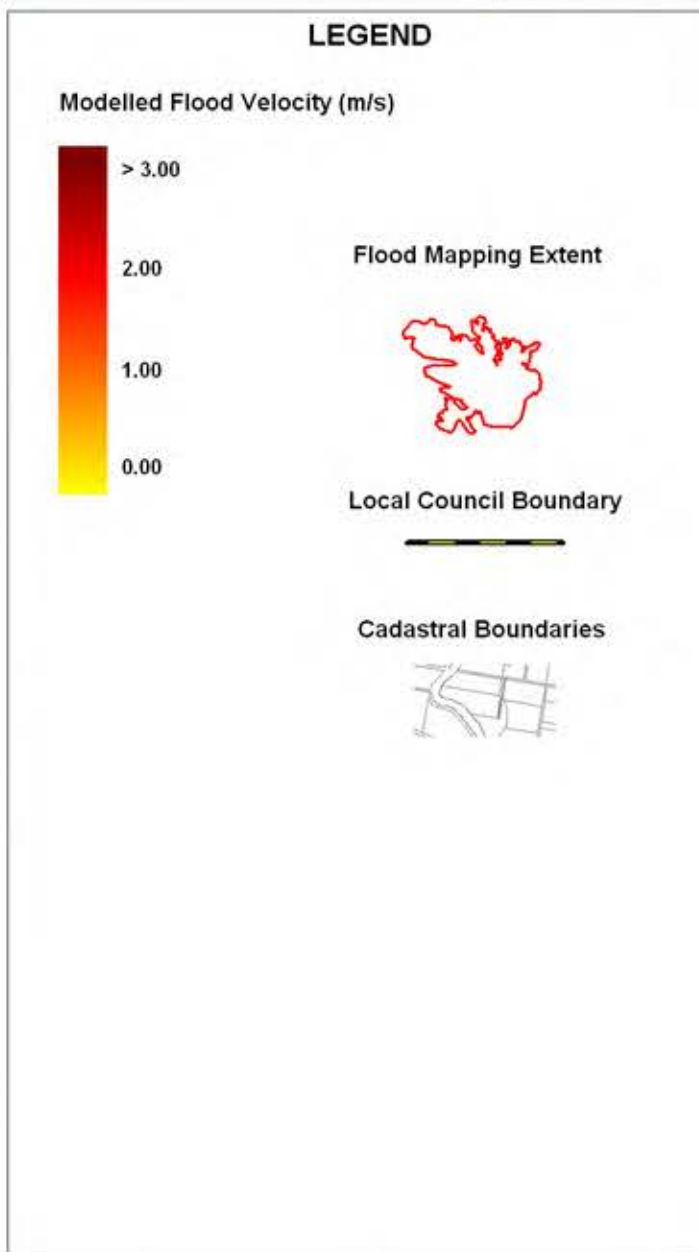
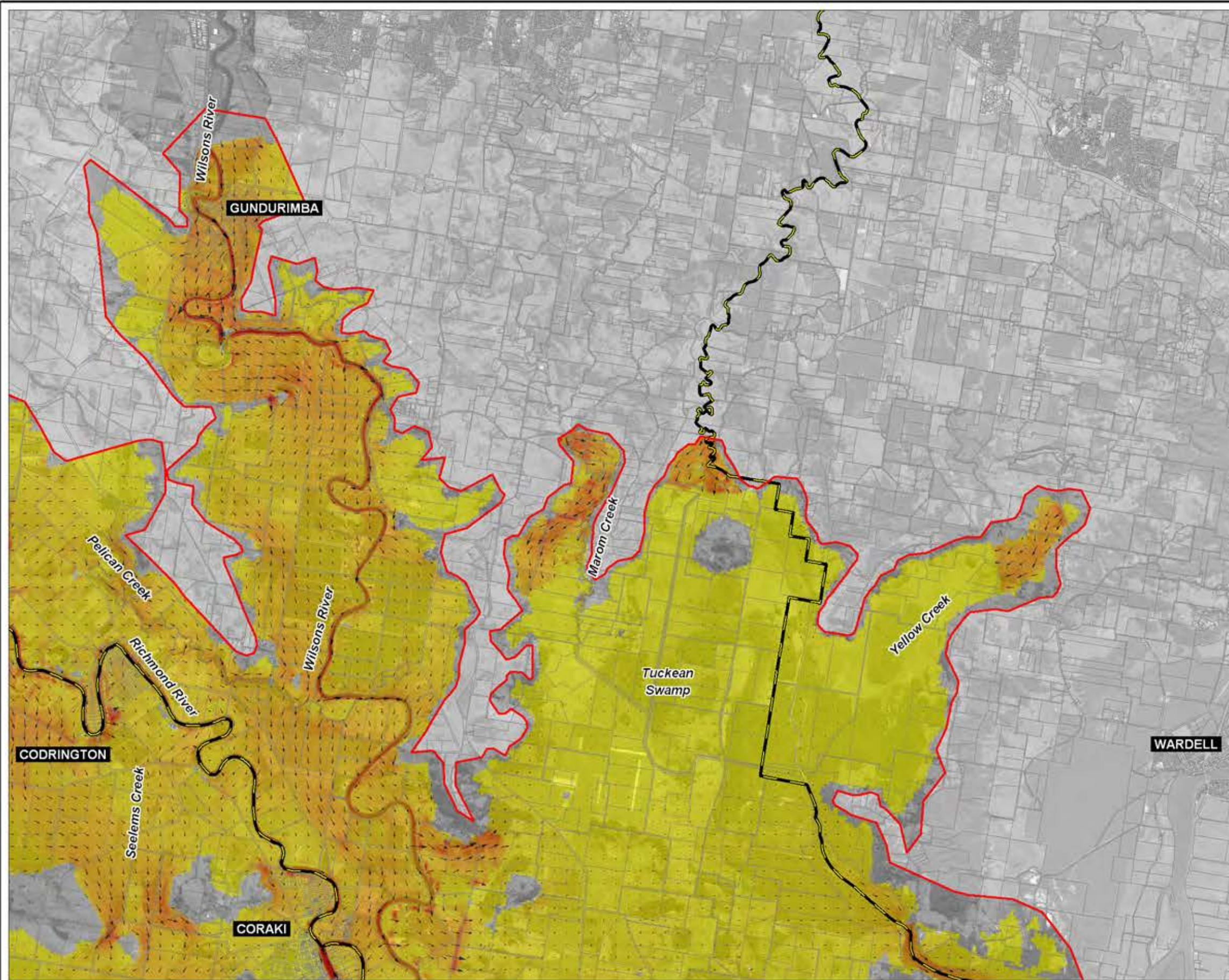
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Map: 6-11
 Rev: C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_059_100311_100yr_Velocity_at_Peak_Flood_RevC.WOR



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Title:
100 Year ARI Velocity at Peak Flood Level - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

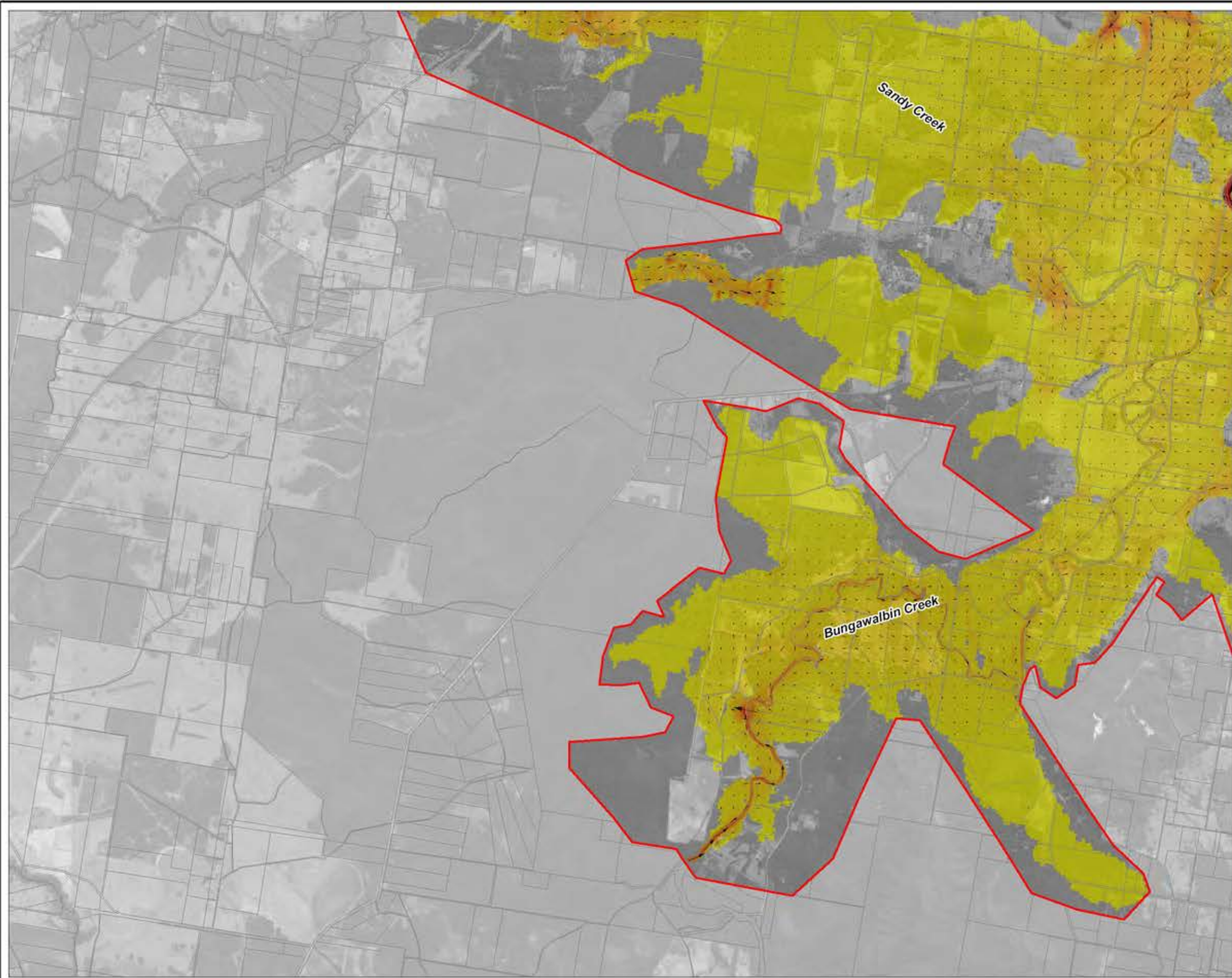
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Map: 6-12
 Rev: C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_059_100311_100yr_Velocity_at_Peak_Flood_RevC.WOR



LEGEND

Modelled Flood Velocity (m/s)

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries



1. Actual flood events can significantly differ from the design flood events presented here. The flood behaviour shown is predicted to occur during a typical design flood event, under the physical and topographic conditions prevailing at the time of preparation.
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Title:
100 Year ARI Velocity at Peak Flood Level - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

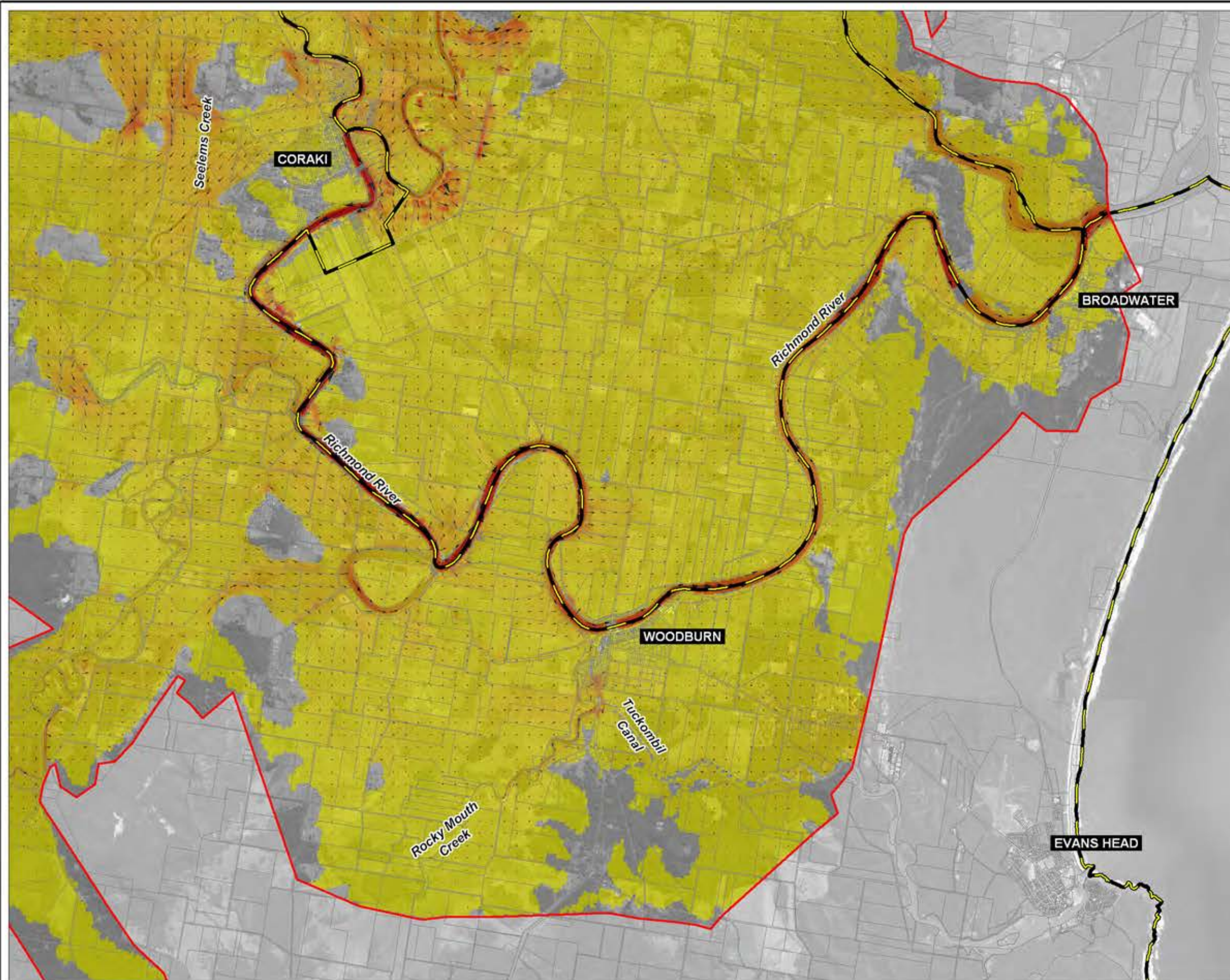
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Map: 6-13
 Rev: C

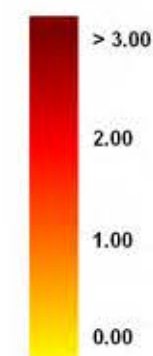


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LEGEND

Modelled Flood Velocity (m/s)



Flood Mapping Extent



Local Council Boundary



Cadastral Boundaries



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Title:
100 Year ARI Velocity at Peak Flood Level - Sheet 4
Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

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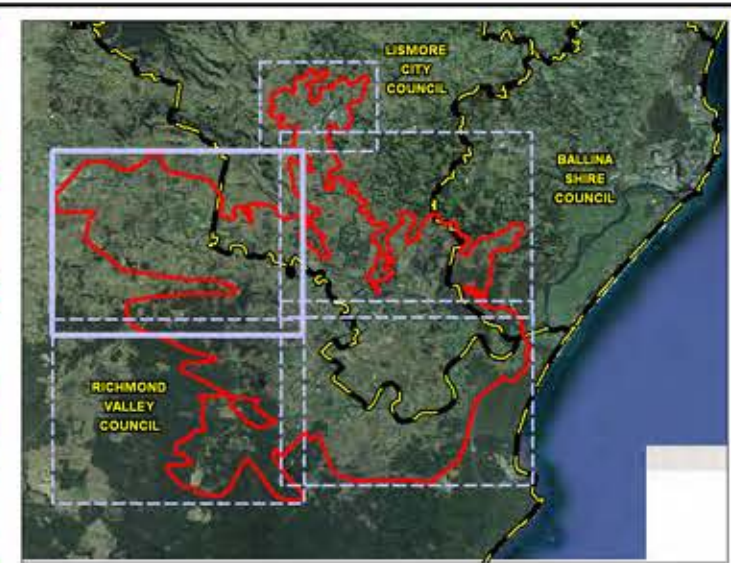
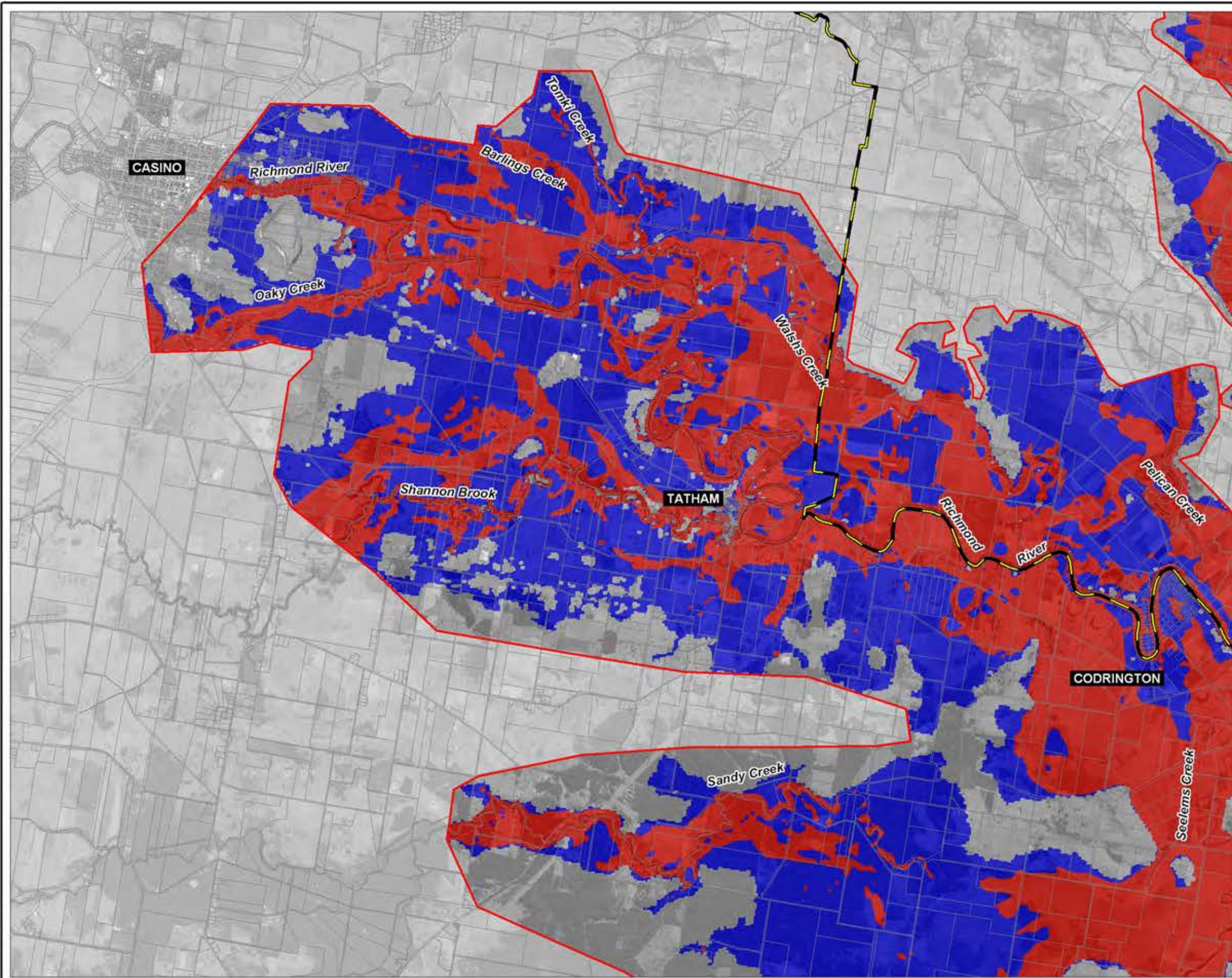


Map:
6-14

Rev:
C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_059_100311_100yr_Velocity_at_Peak_Flood_RevC.WOR




LEGEND


Velocity Depth Product (m²/s)

- Velocity x Depth > 0.4
- Velocity x Depth < 0.4


Flood Mapping Extent



Local Council Boundary



Cadastral Boundaries




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Title:
100 Year ARI Velocity Depth Product - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

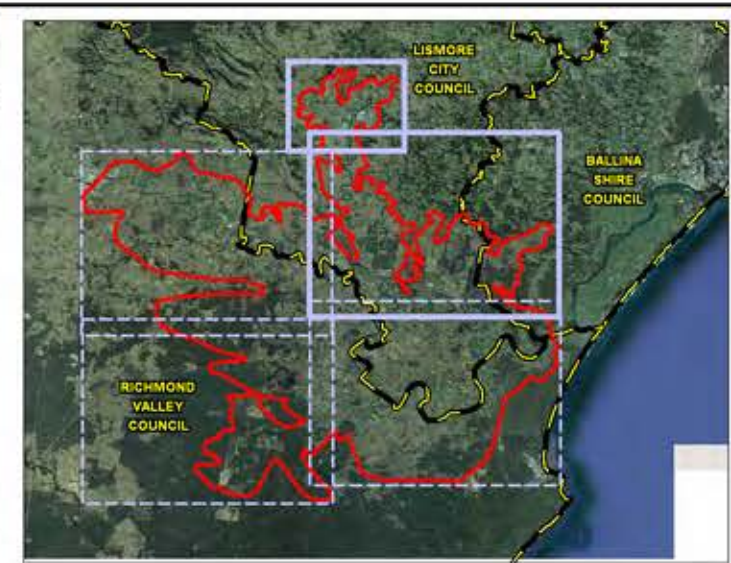
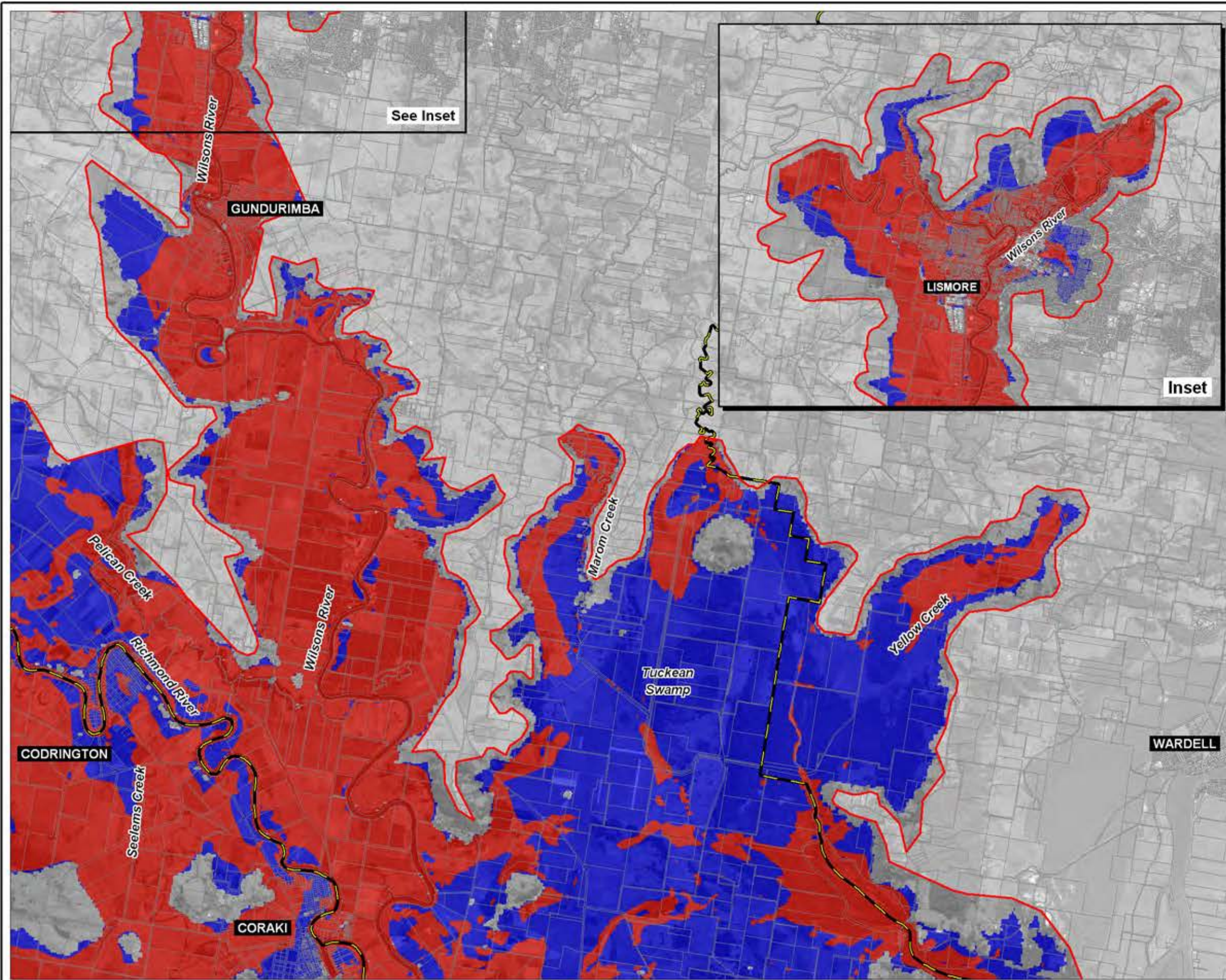
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Map:	Rev:
6-15	C



Filepath : I:\B16784_I_BMC_RichmondMegaModelDRG\FLD_052_100311_100yr_Velocity_Depth_RevC.WOR



LEGEND

Velocity Depth Product (m²/s)

- Velocity x Depth > 0.4
- Velocity x Depth < 0.4

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries



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5. The results presented for the Lismore area (approximately defined by the inset), are taken from the Lismore Flood Study (Patterson Britton, 2002).

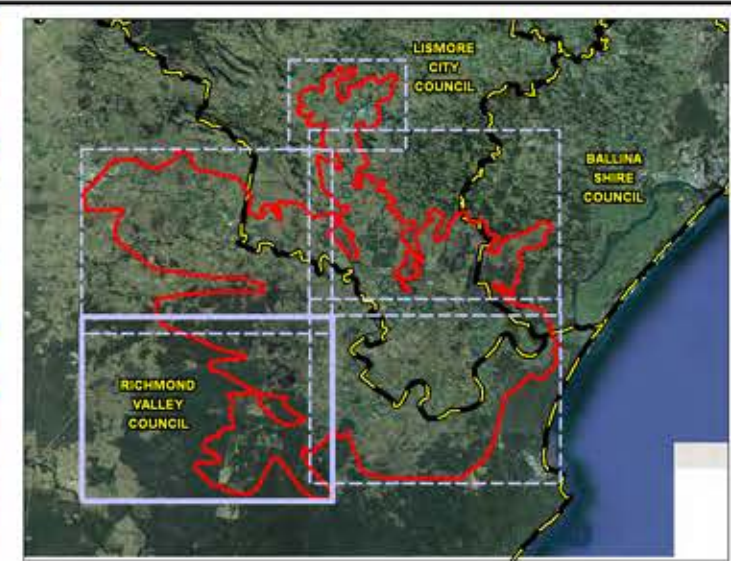
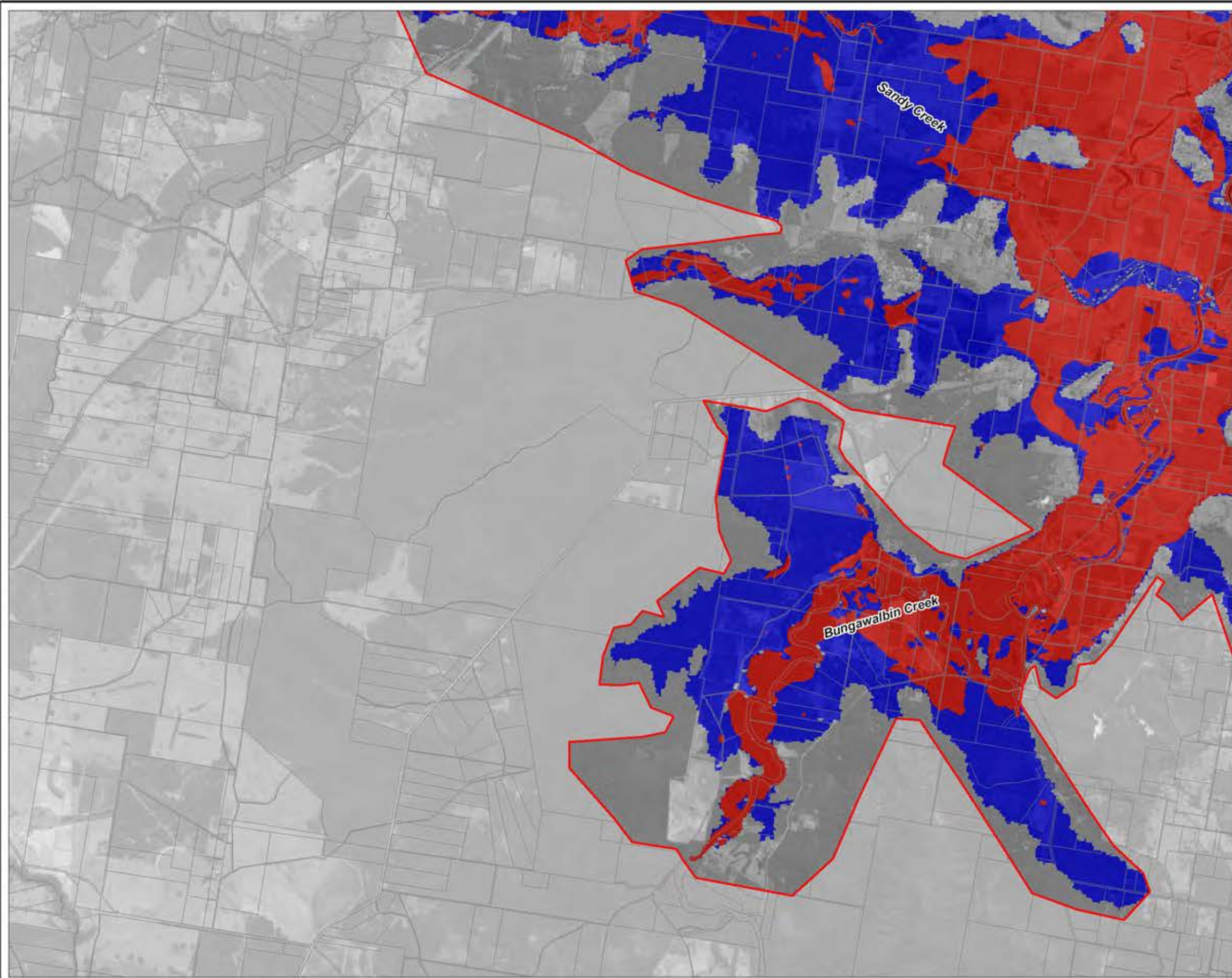
Title:
100 Year ARI Velocity Depth Product - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

Map: 6-16
 Rev: C

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Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_052_100311_100yr_Velocity_Depth_RevC.WOR



LEGEND

Velocity Depth Product (m²/s)

- Velocity x Depth > 0.4
- Velocity x Depth < 0.4

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries



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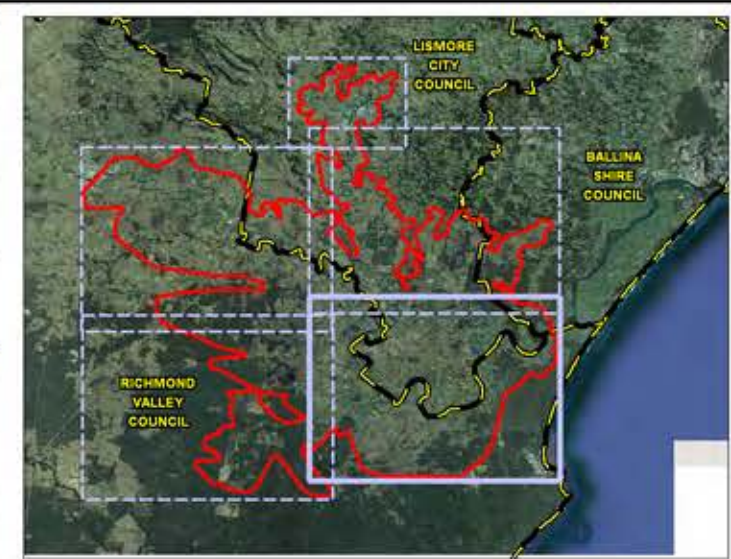
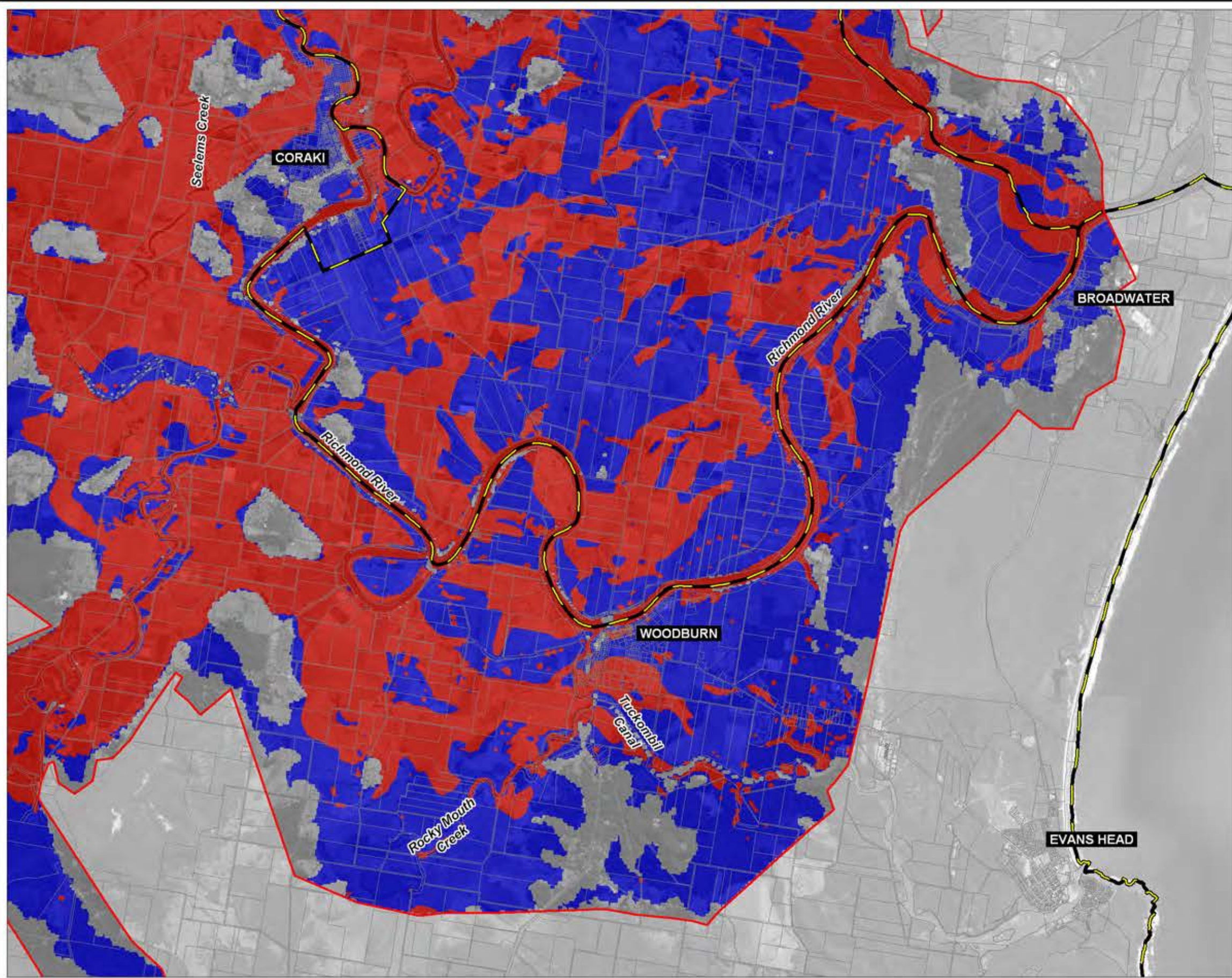
Title:
100 Year ARI Velocity Depth Product - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

Map: 6-17
 Rev: C

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Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_052_100311_100yr_Velocity_Depth_RevC.WOR



LEGEND

Velocity Depth Product (m²/s)

- Velocity x Depth > 0.4
- Velocity x Depth < 0.4

Flood Mapping Extent

Local Council Boundary

Cadastral Boundaries

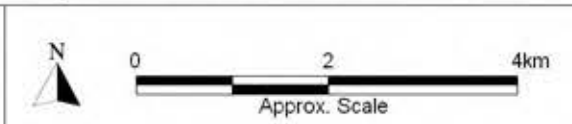


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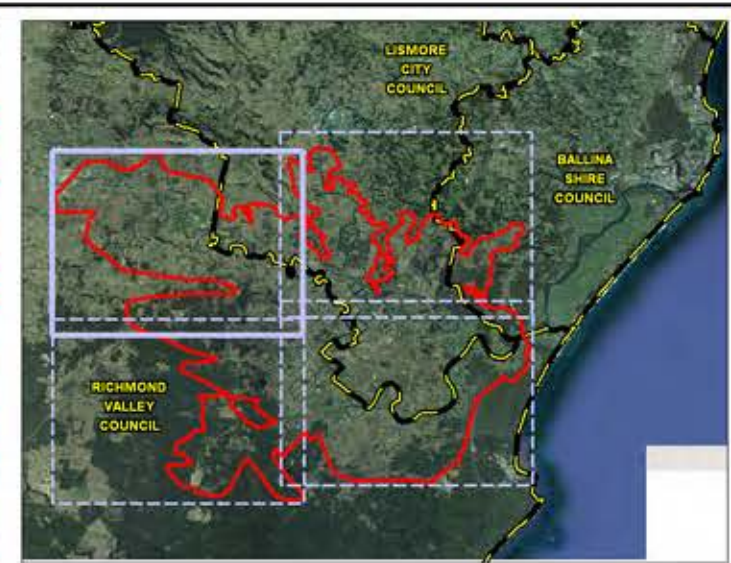
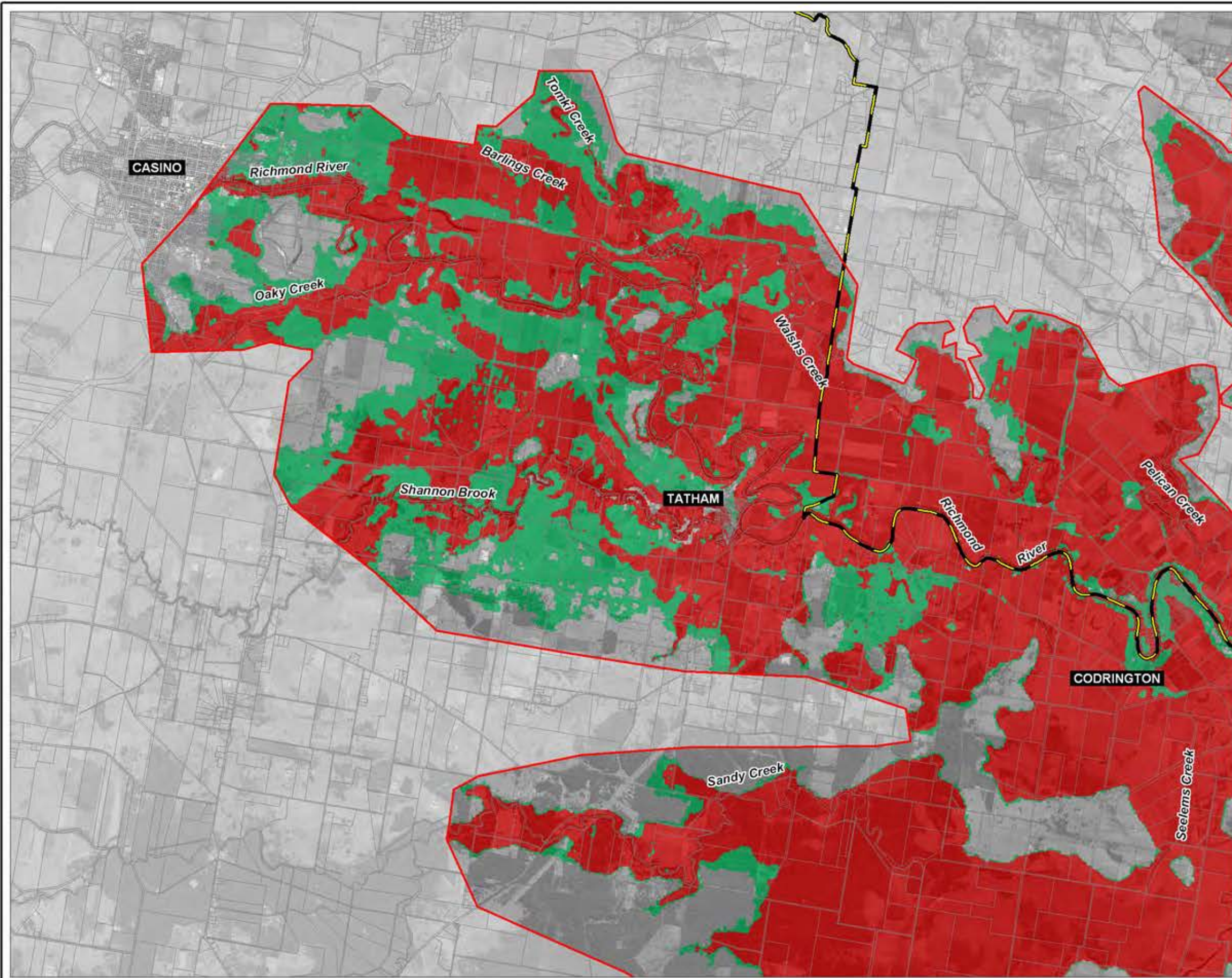
Title:
100 Year ARI Velocity Depth Product - Sheet 4
Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

Map: **6-18** Rev: **C**

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LEGEND


NSW Floodplain Development Manual Flood Hazard Category

- High Hazard
- Low Hazard


Flood Mapping Extent



Local Council Boundary



Cadastral Boundaries




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Title:
100 Year ARI Flood Hazard - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

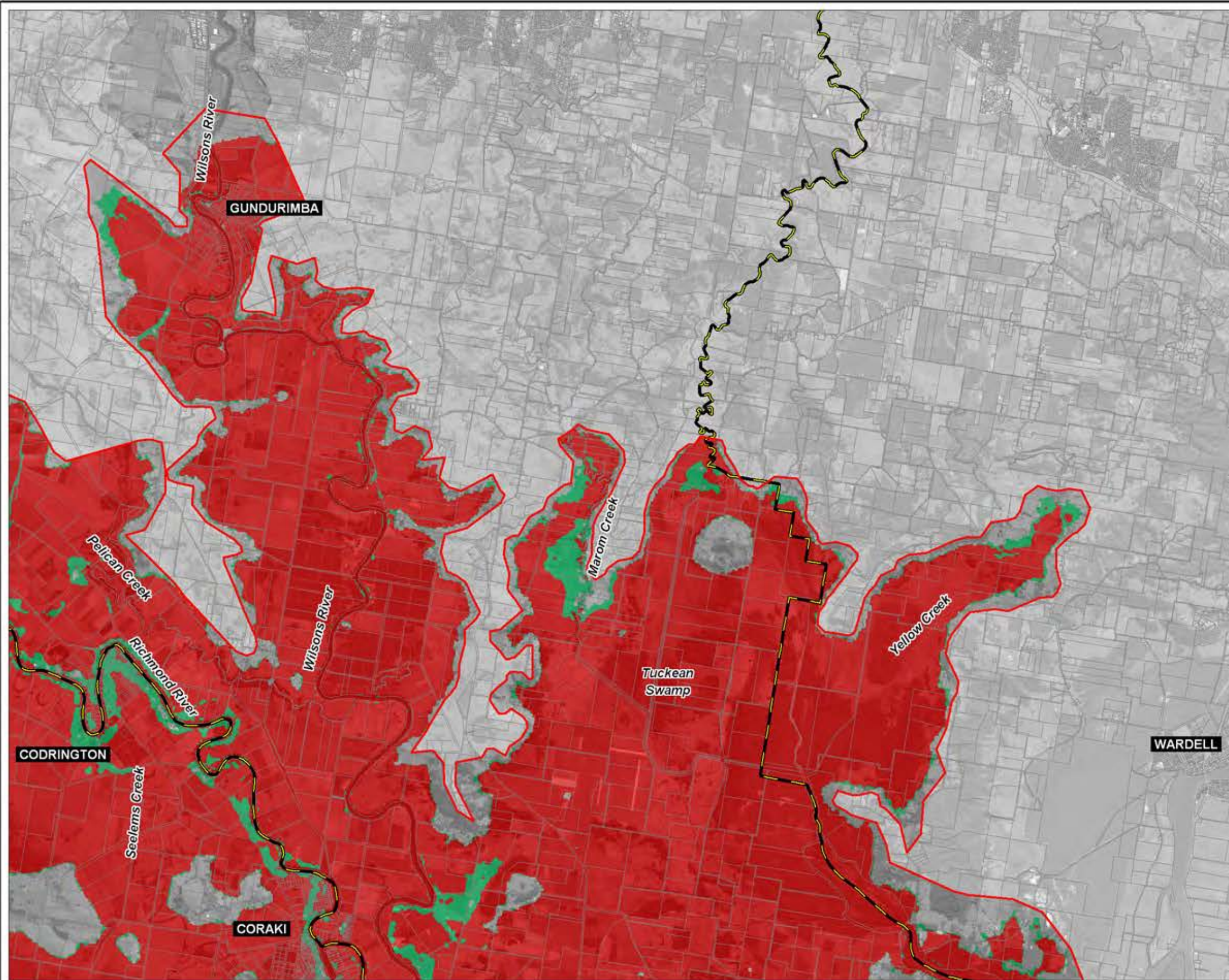
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Map:	Rev:
6-19	C



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LEGEND


NSW Floodplain Development Manual Flood Hazard Category

- High Hazard
- Low Hazard


Flood Mapping Extent



Local Council Boundary



Cadastral Boundaries

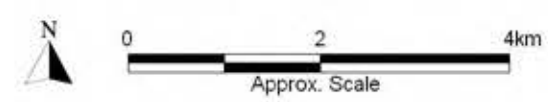



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Title:
100 Year ARI Flood Hazard - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

Map: 6-20
 Rev: C

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Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_051_100311_100yr_Hazard_NSW_RevC.WOR



LEGEND

NSW Floodplain Development Manual Flood Hazard Category

- High Hazard
- Low Hazard

Flood Mapping Extent

Flood Mapping Extent

Local Council Boundary

Local Council Boundary

Cadastral Boundaries

Cadastral Boundaries



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Title:
100 Year ARI Flood Hazard - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

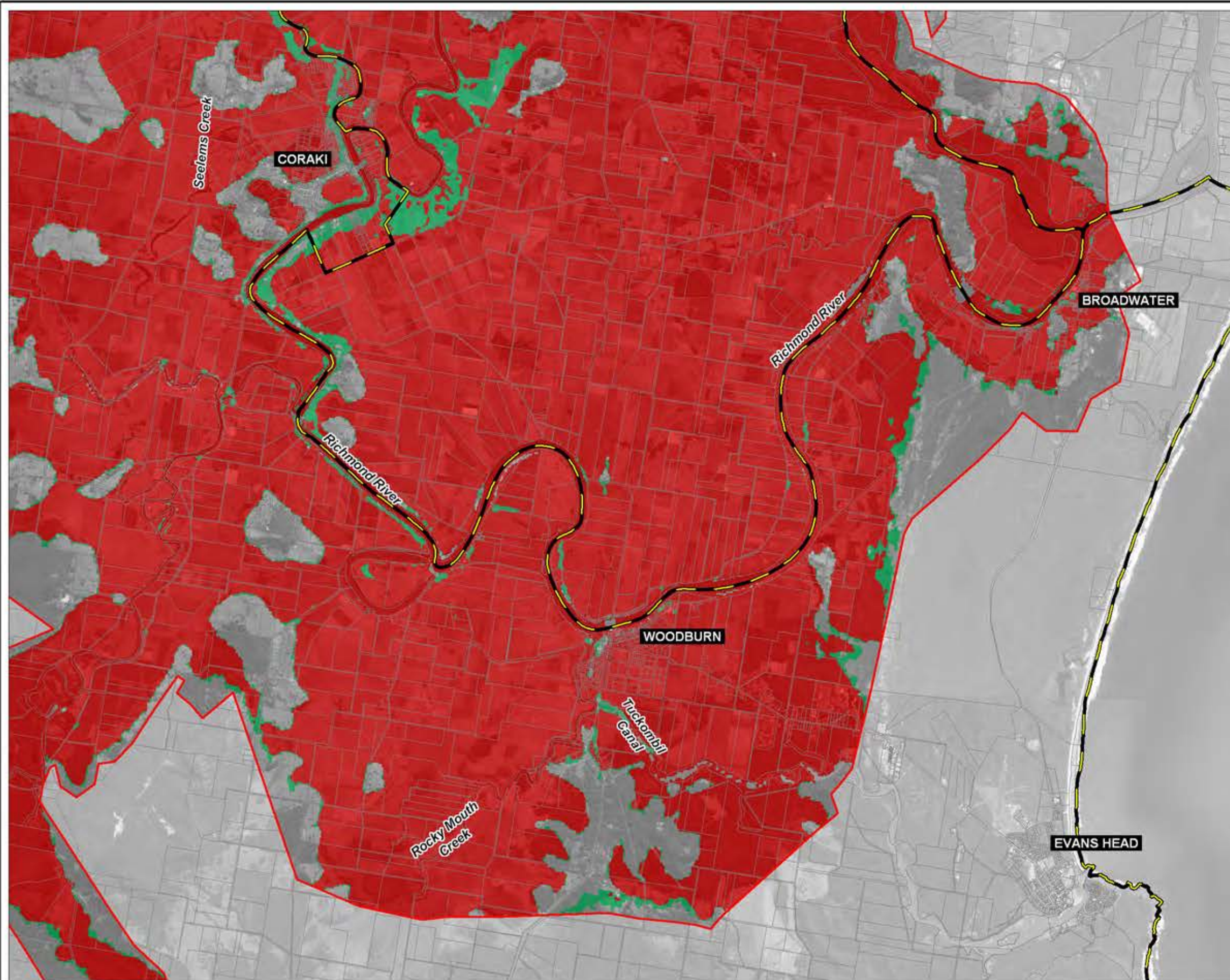
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Map: 6-21	Rev: C
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LEGEND

NSW Floodplain Development Manual Flood Hazard Category

- High Hazard
- Low Hazard

Flood Mapping Extent

Local Council Boundary

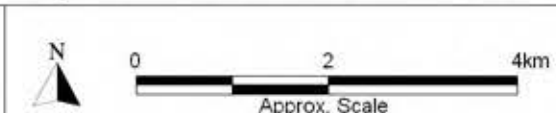
Cadastral Boundaries



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Title:
100 Year ARI Flood Hazard - Sheet 4
Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

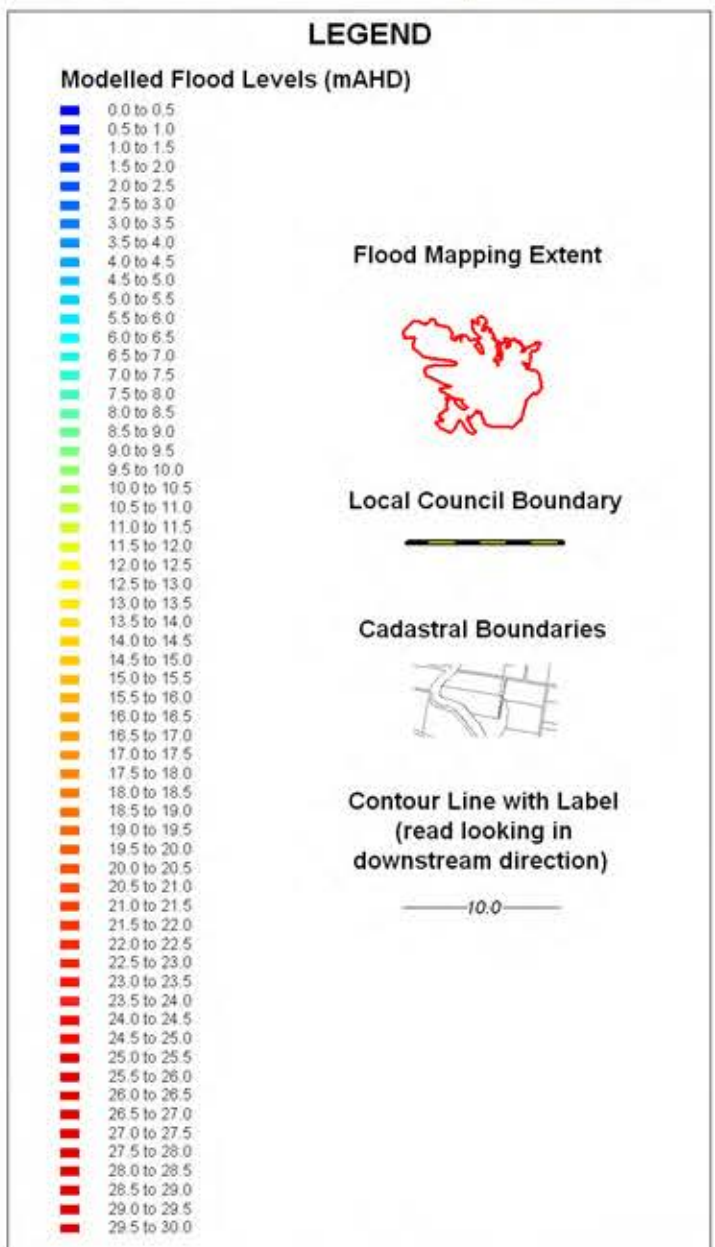
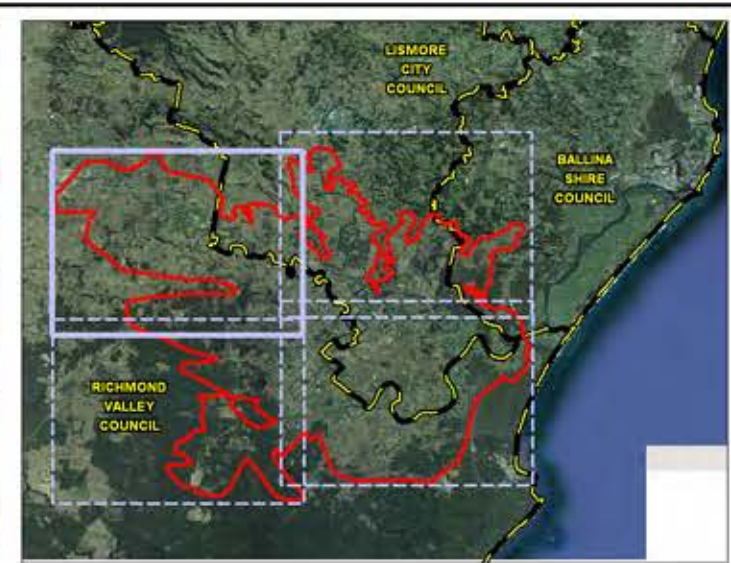
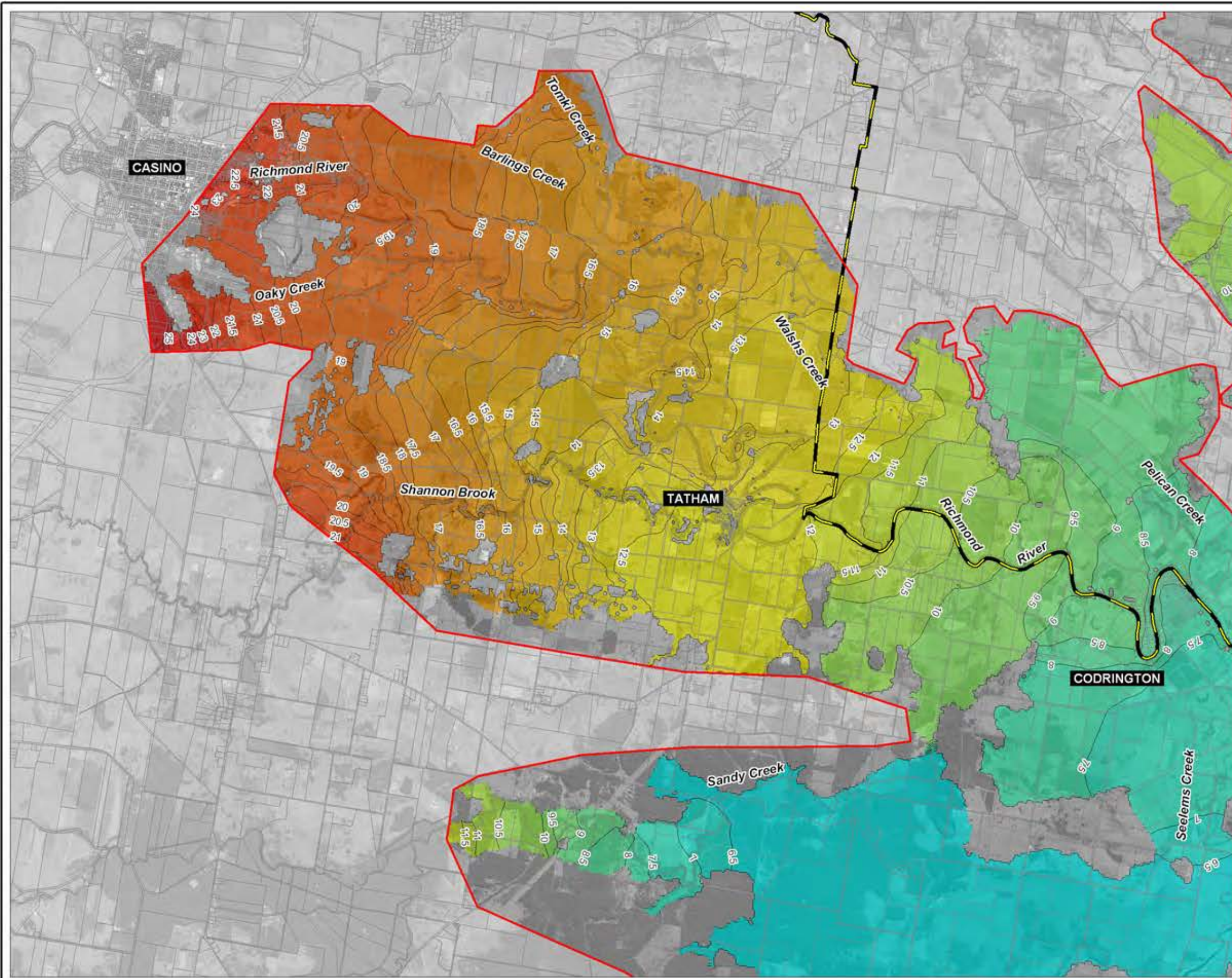
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Map: 6-22	Rev: C
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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 1 - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

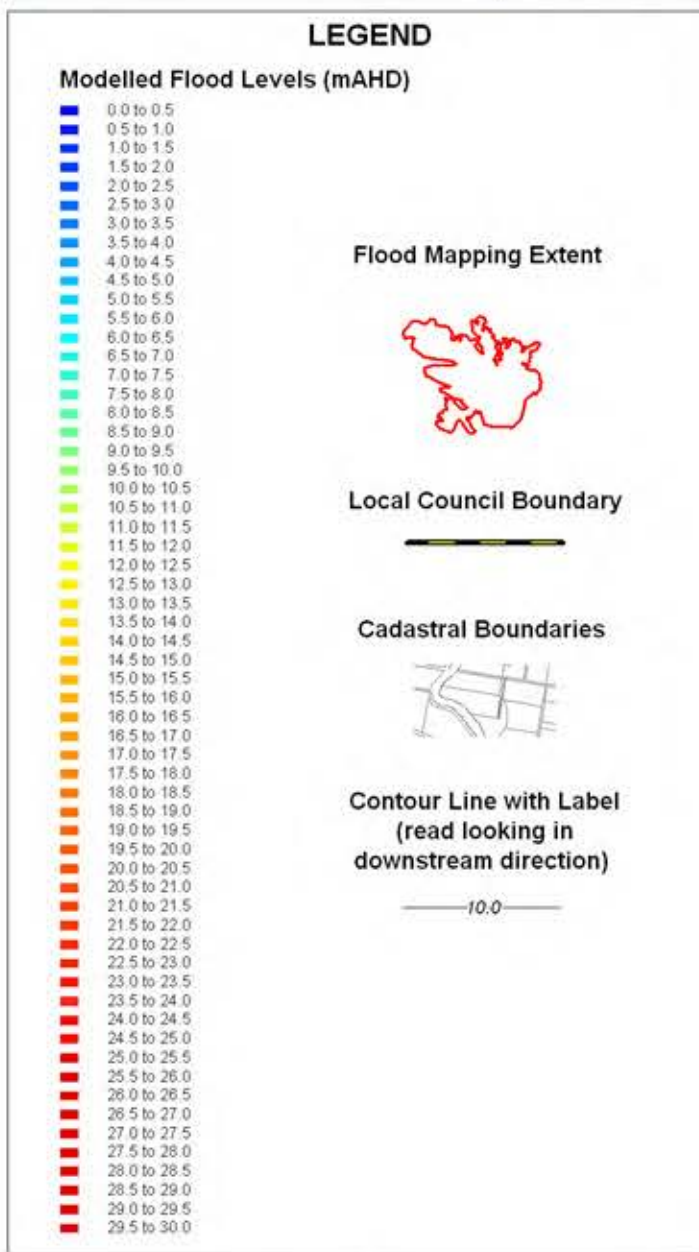
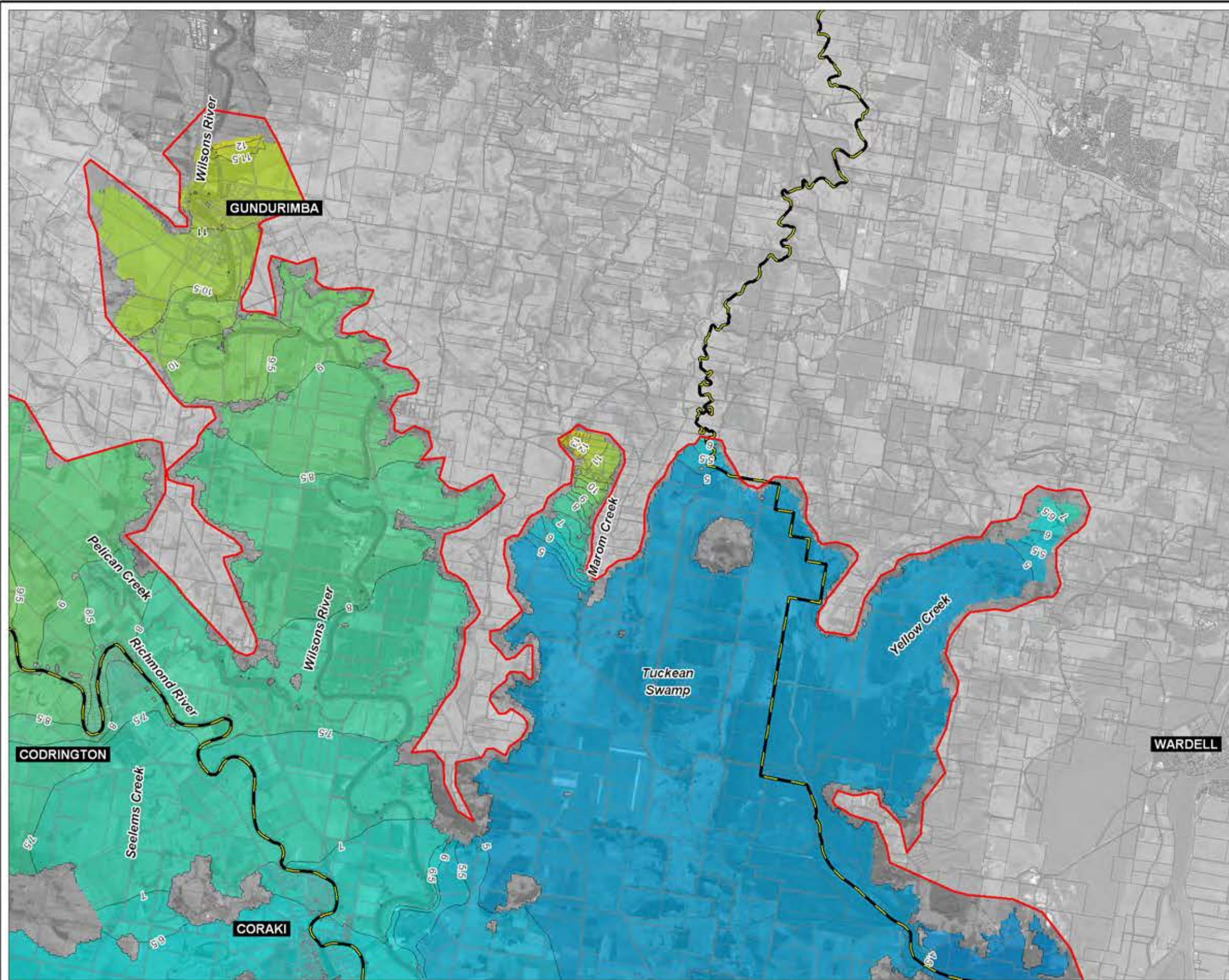
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Map: 6-23
 Rev: C



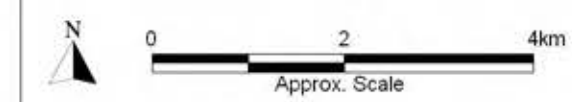
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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 1 - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

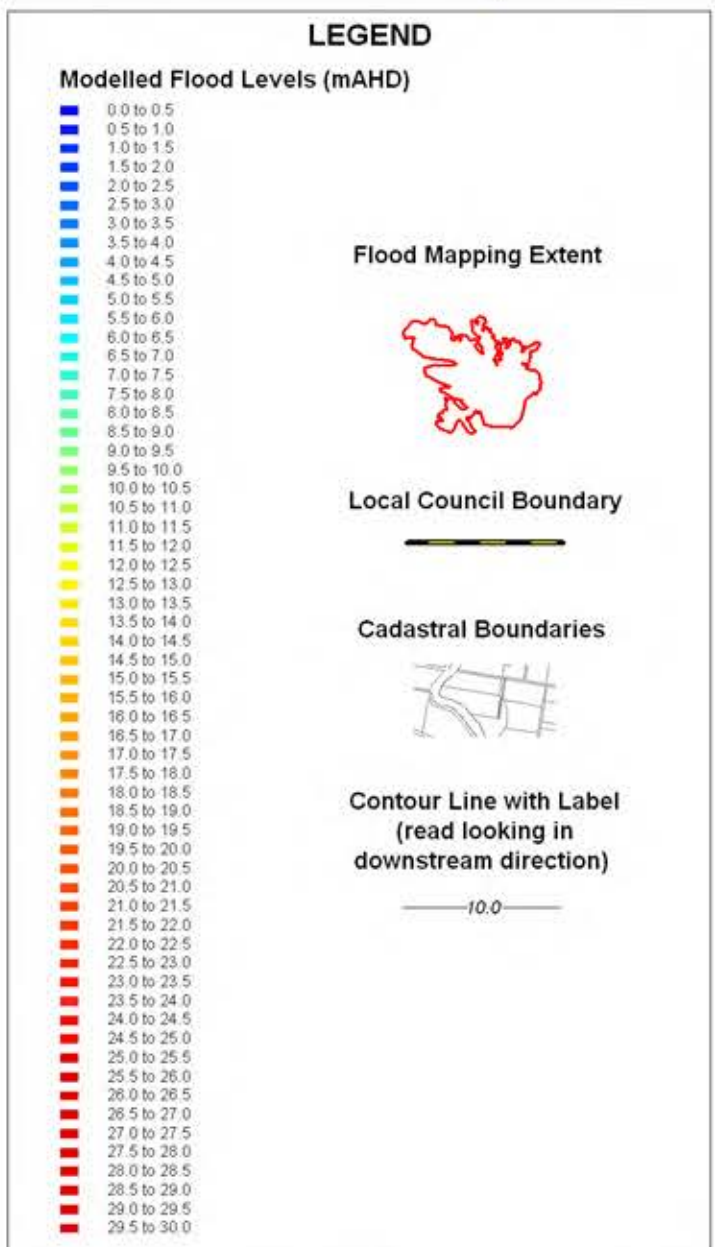
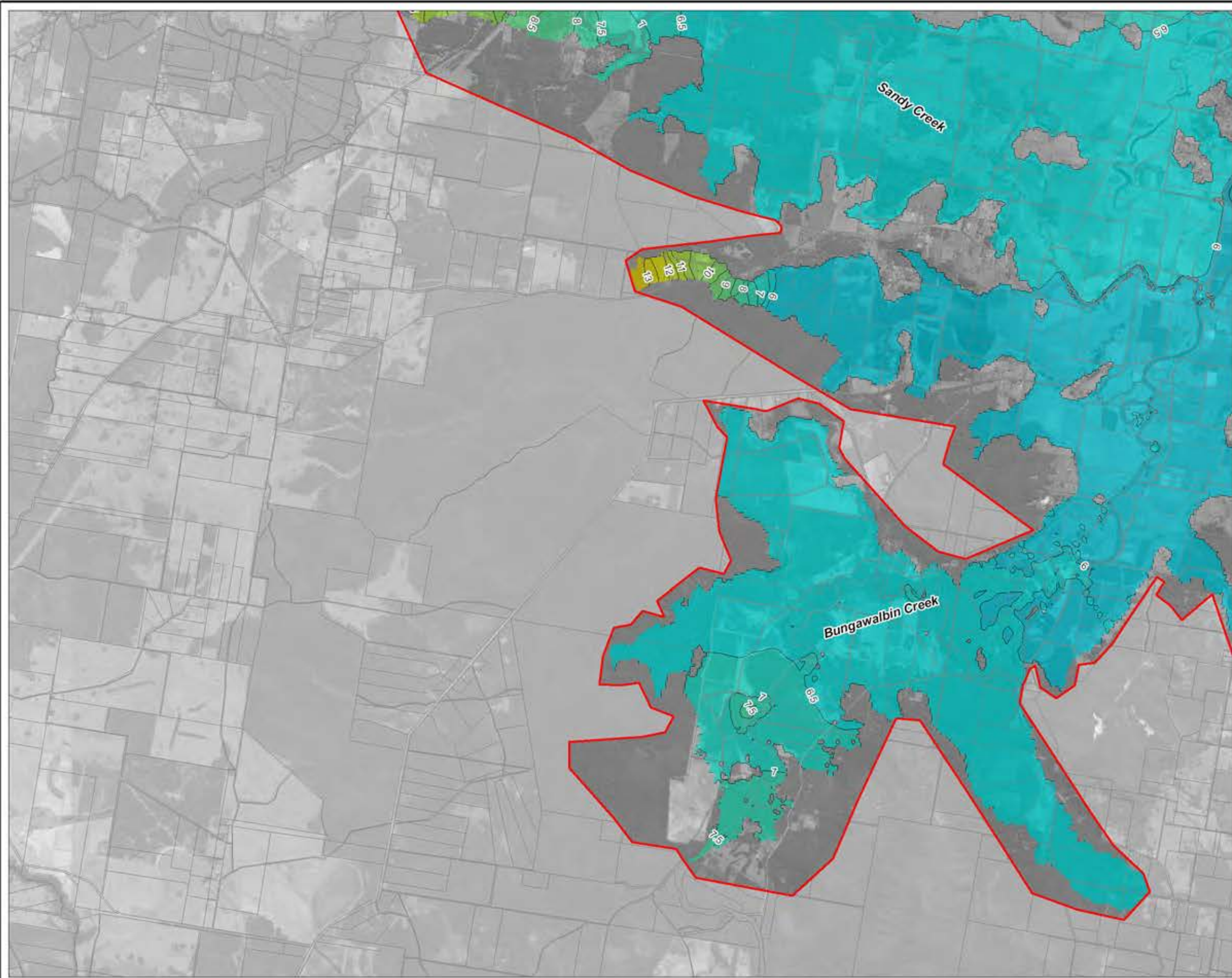
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Map: **6-24** Rev: **C**



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_064_100315_O100yrCC1_Levels_RevC.wor



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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 1 - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

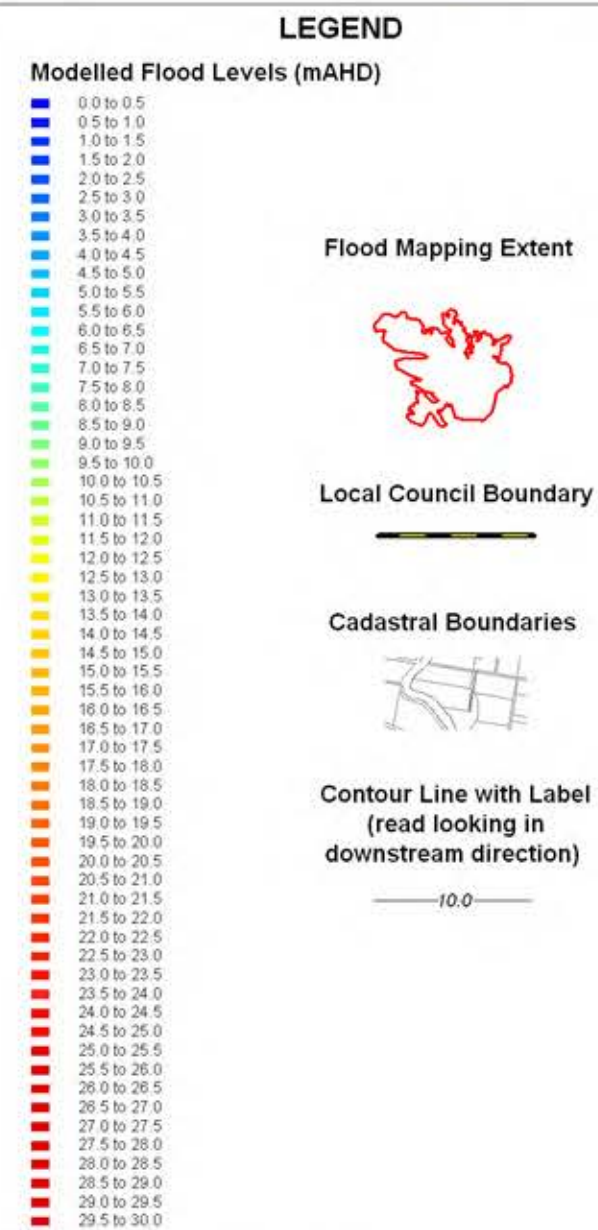
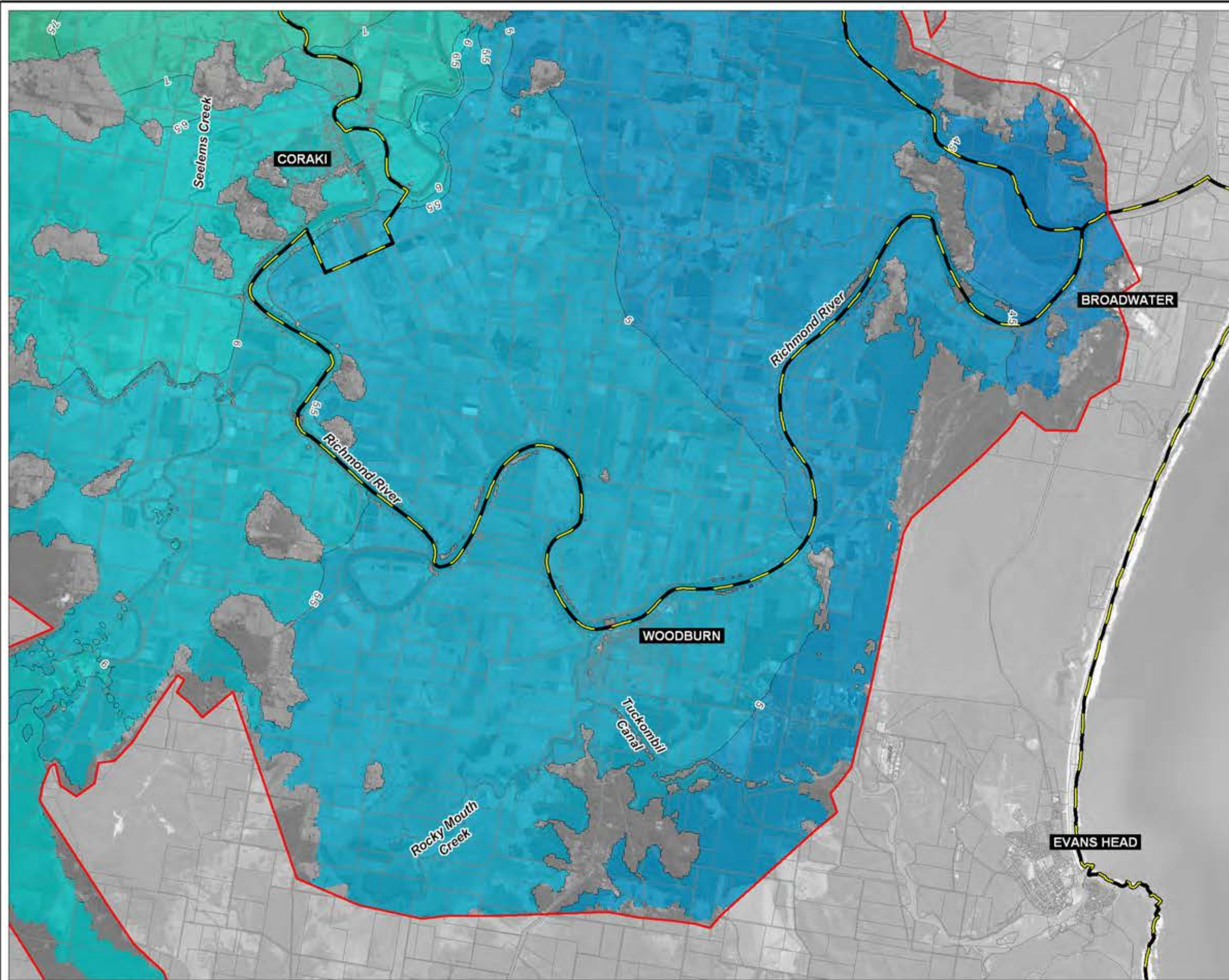
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Map: 6-25
 Rev: C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_064_100315_O100yrCC1_Levels_RevC.wor



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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 1 - Sheet 4
Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

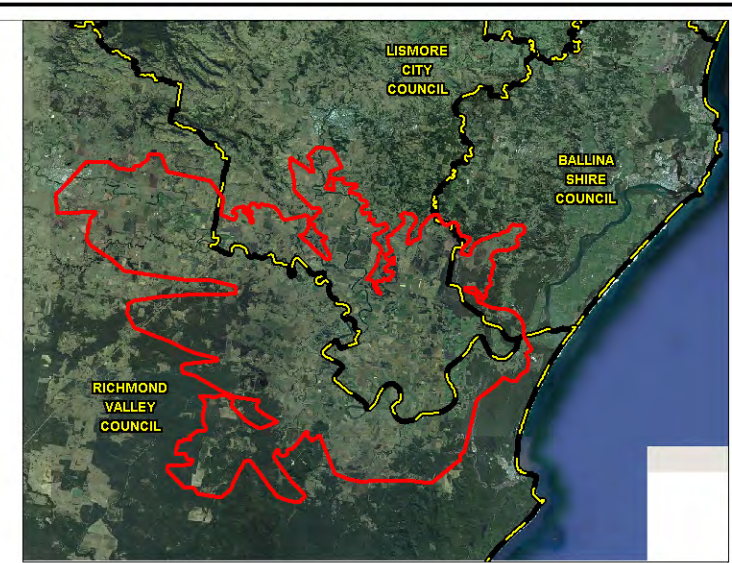
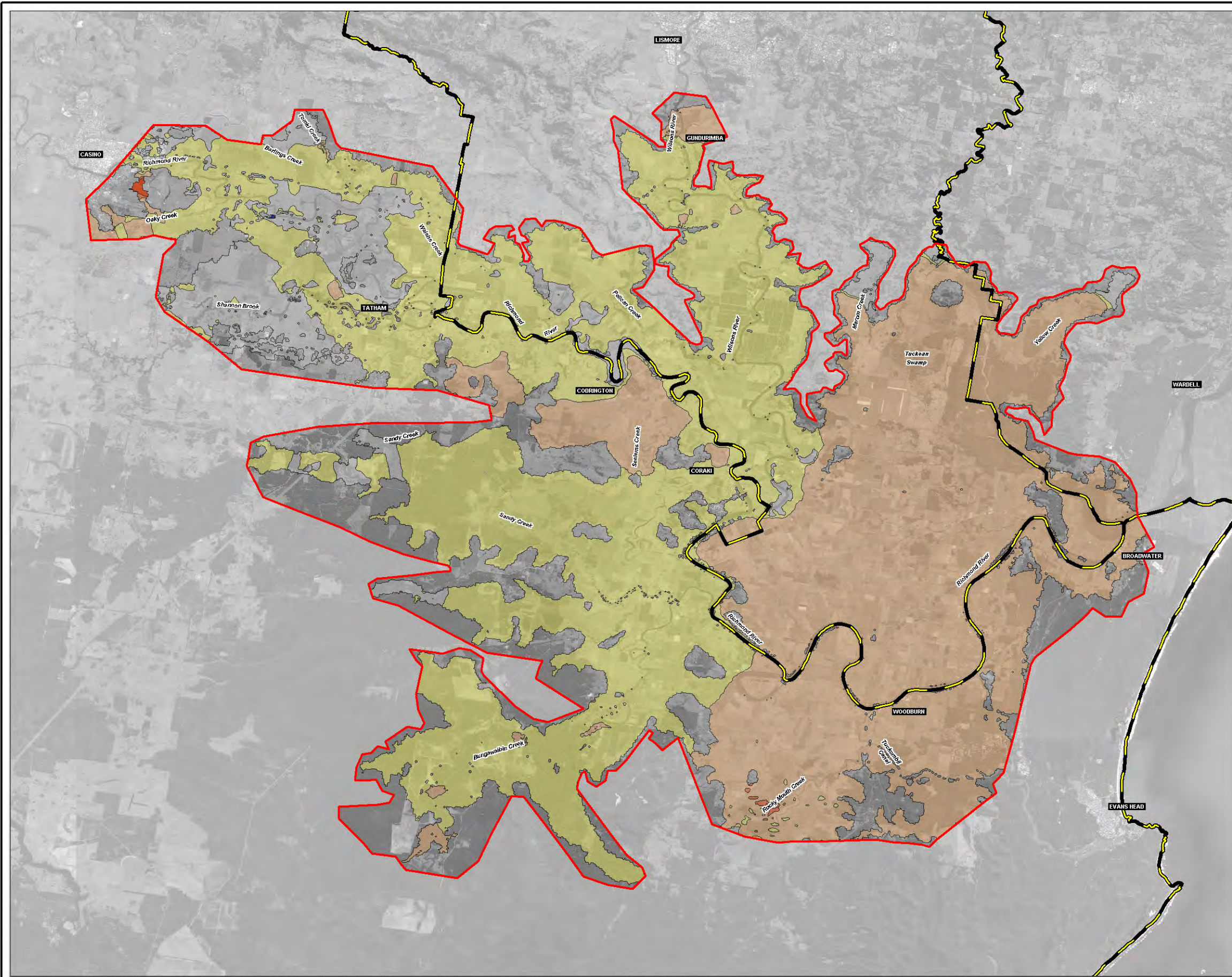
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Map: 6-26
 Rev: C



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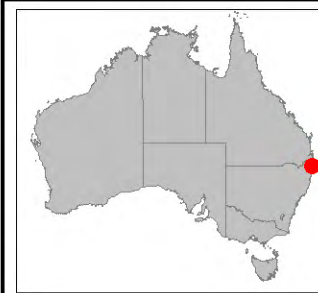
LEGEND

Flood Impact (m)

- < -0.50
- -0.50 to -0.25
- -0.25 to -0.10
- -0.10 to 0.10
- 0.10 to 0.25
- 0.25 to 0.50
- 0.50 to 0.75
- > 0.75

Flood Depth Mapping Extent

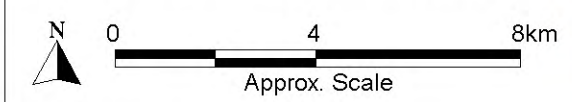
Local Council Boundary



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Title:
100 Year ARI Increase in Peak Flood Levels - Climate Change Scenario 1 (0.4m Sea Level Rise and 10% Rainfall Increase)

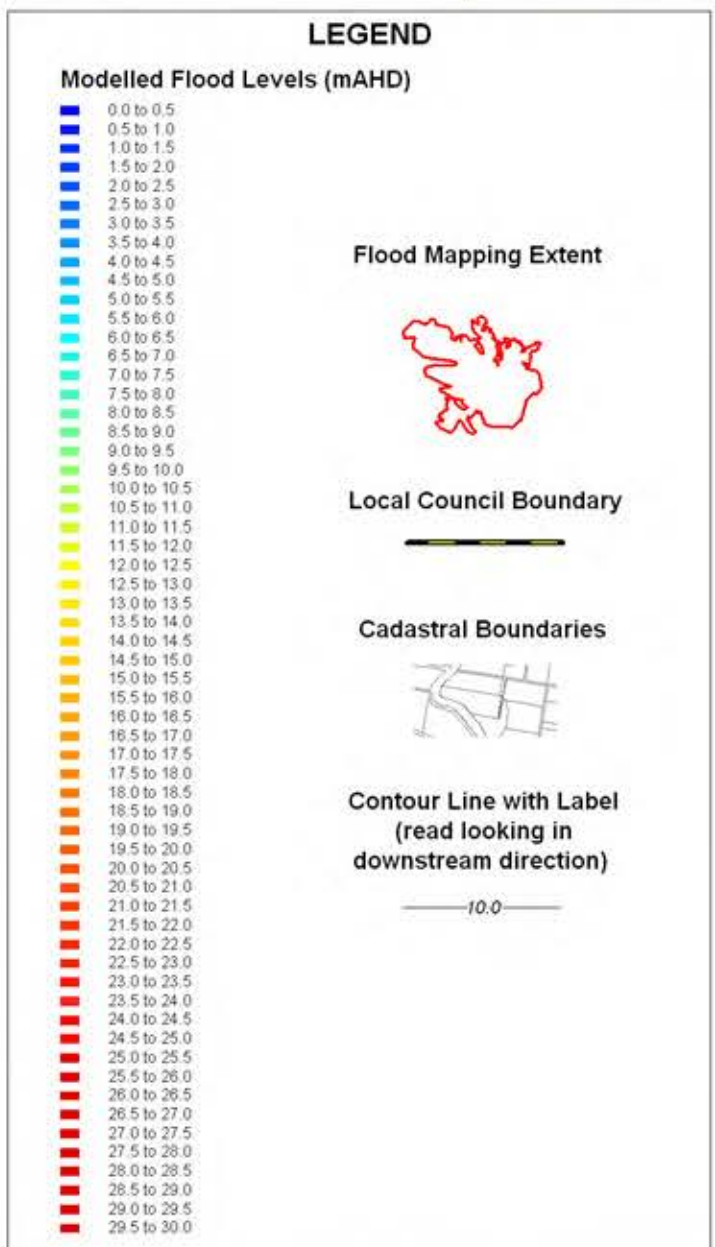
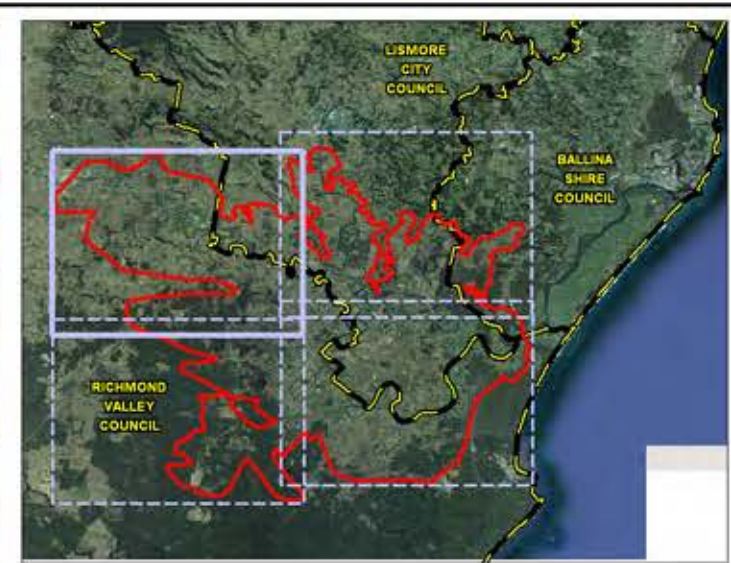
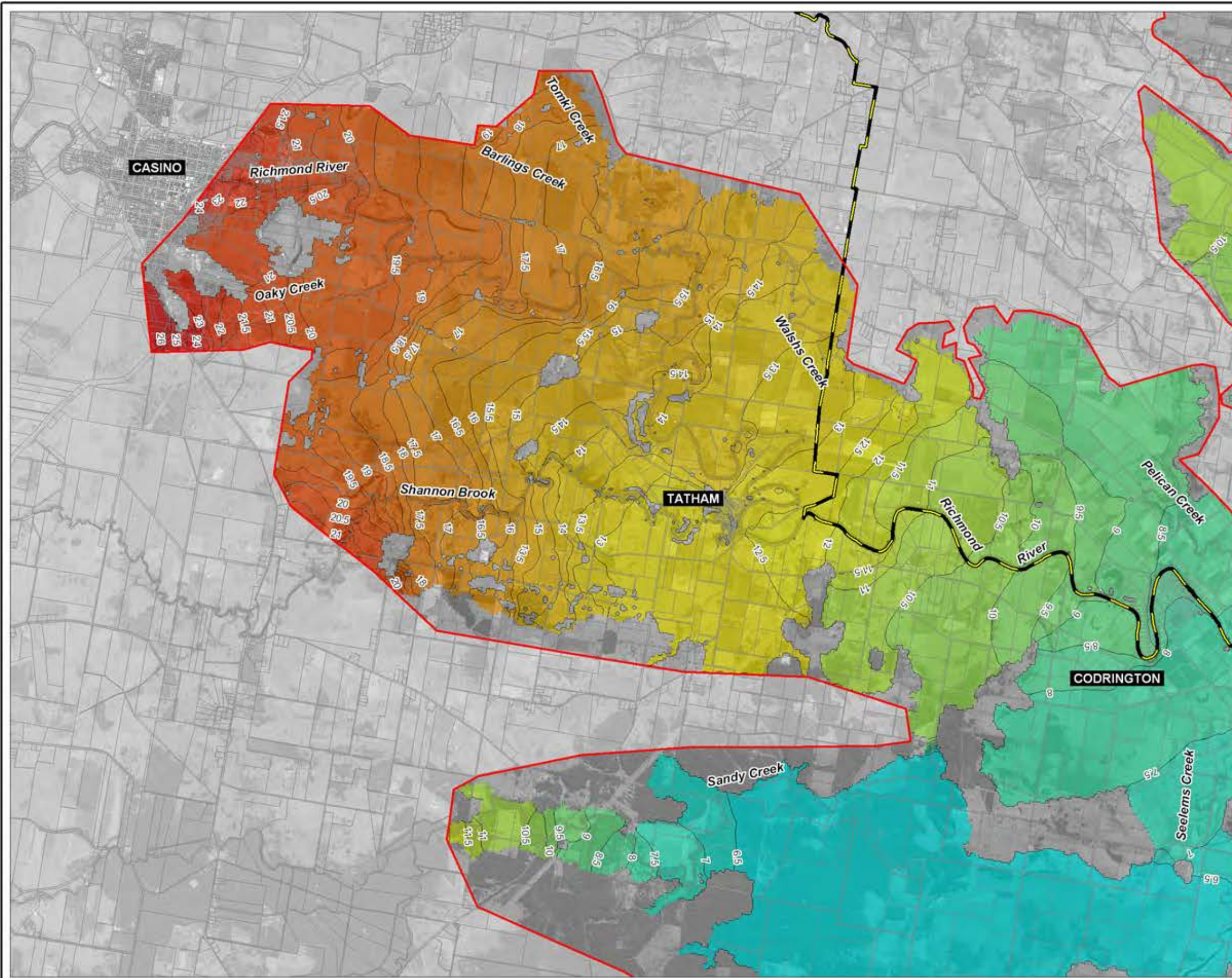
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Map: **6-27**
 Rev: **B**



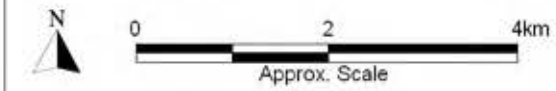
Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_067_100208 100yr_Climate Change Impacts.wor



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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 2 - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

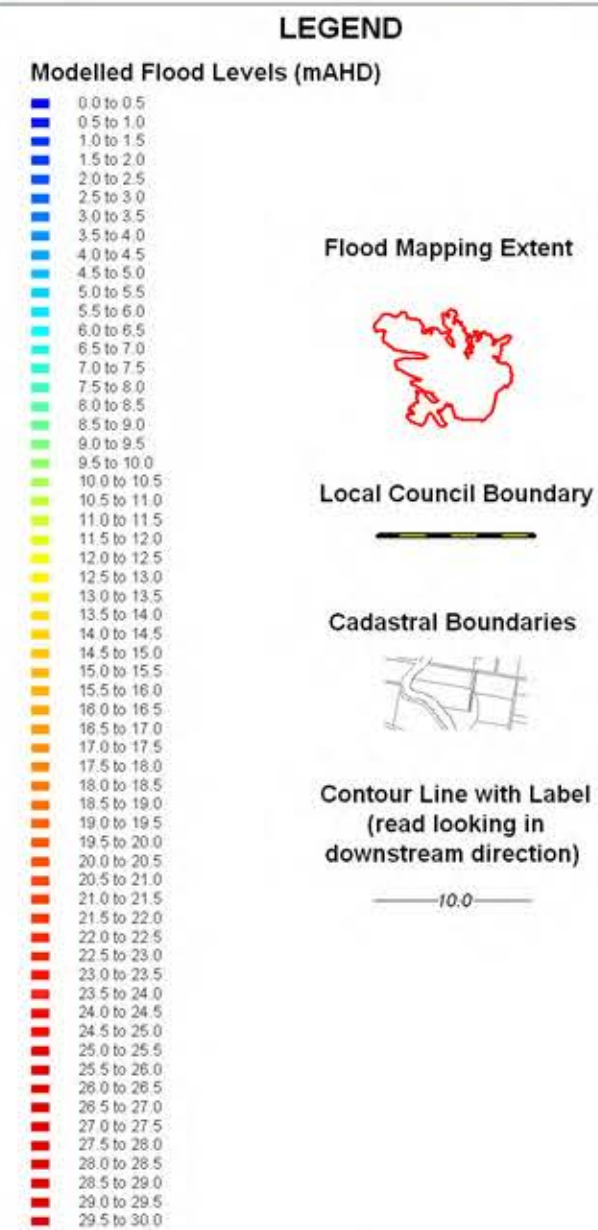
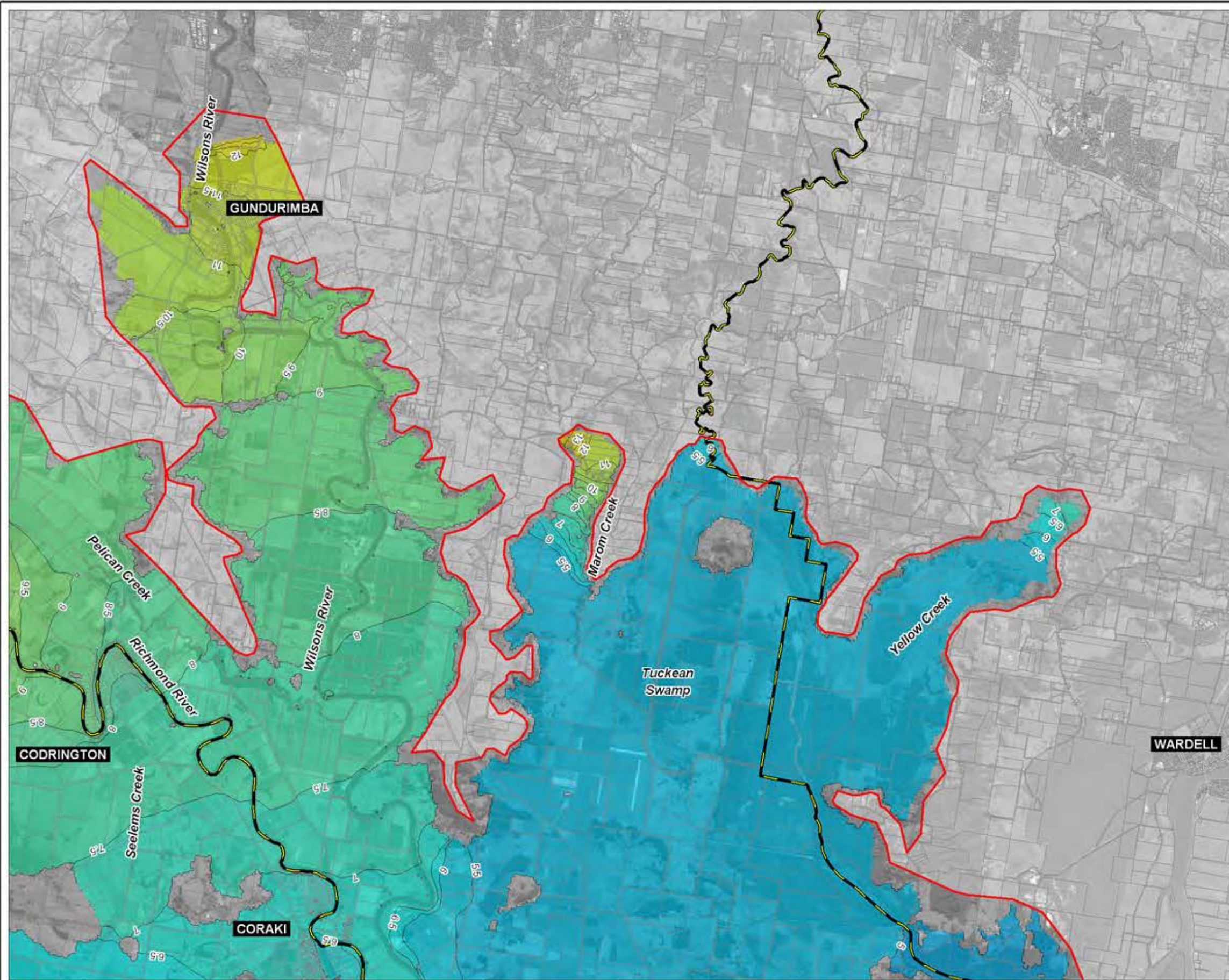
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Map: **6-28**
 Rev: **C**



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_065_100315_0100yrCC2_Levels_RevC.wor



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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 2 - Sheet 2
Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

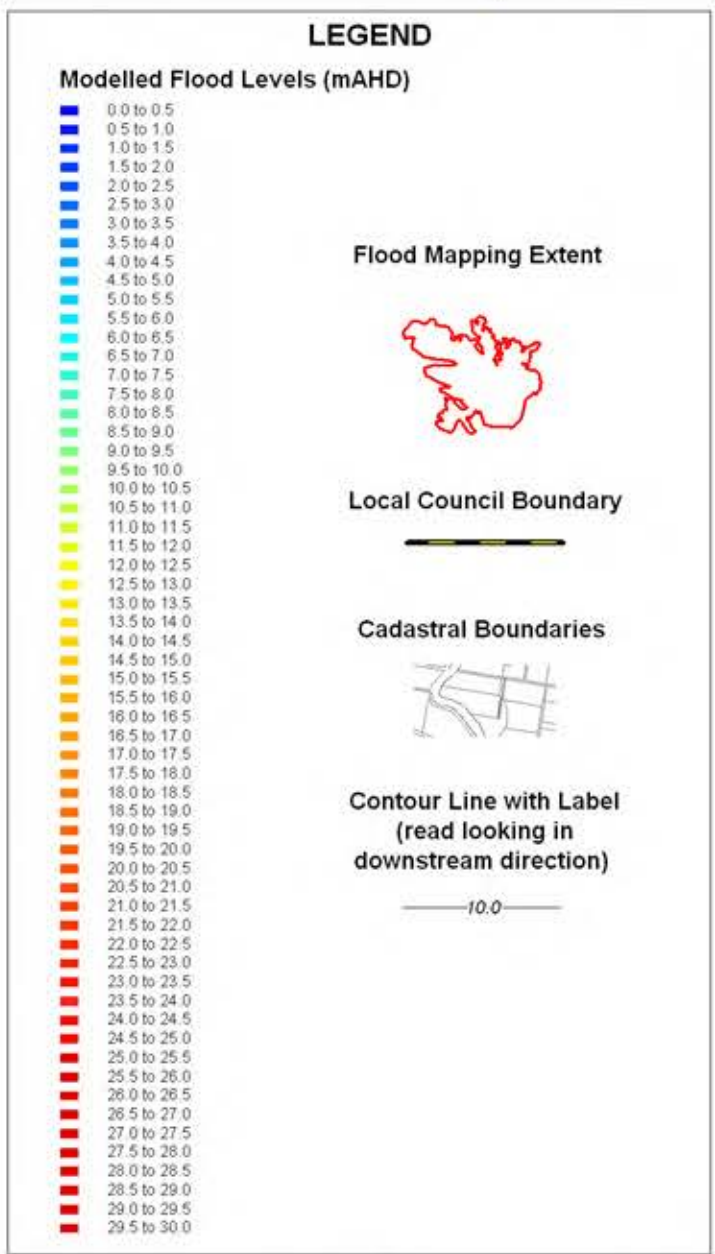
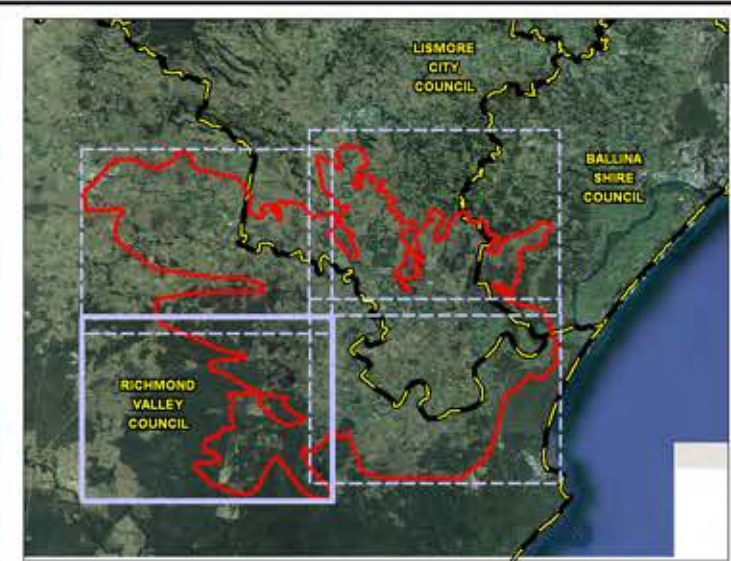
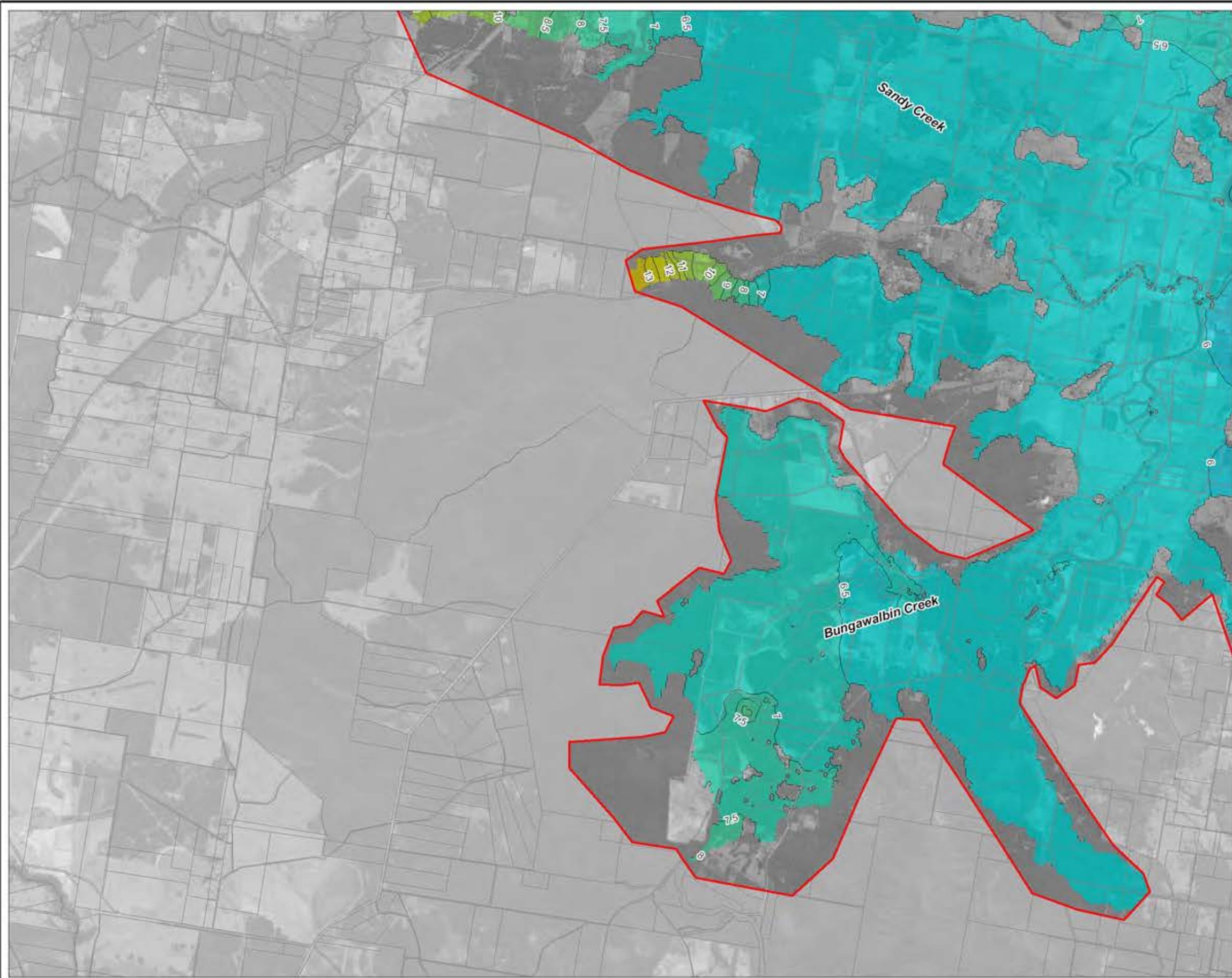
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Map: 6-29
 Rev: C



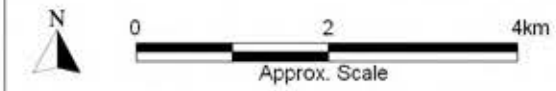
Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_065_100315_0100yrCC2_Levels_RevC.wor



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Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 2 - Sheet 3
Bungawalbin Creek and Lower Sandy Creek

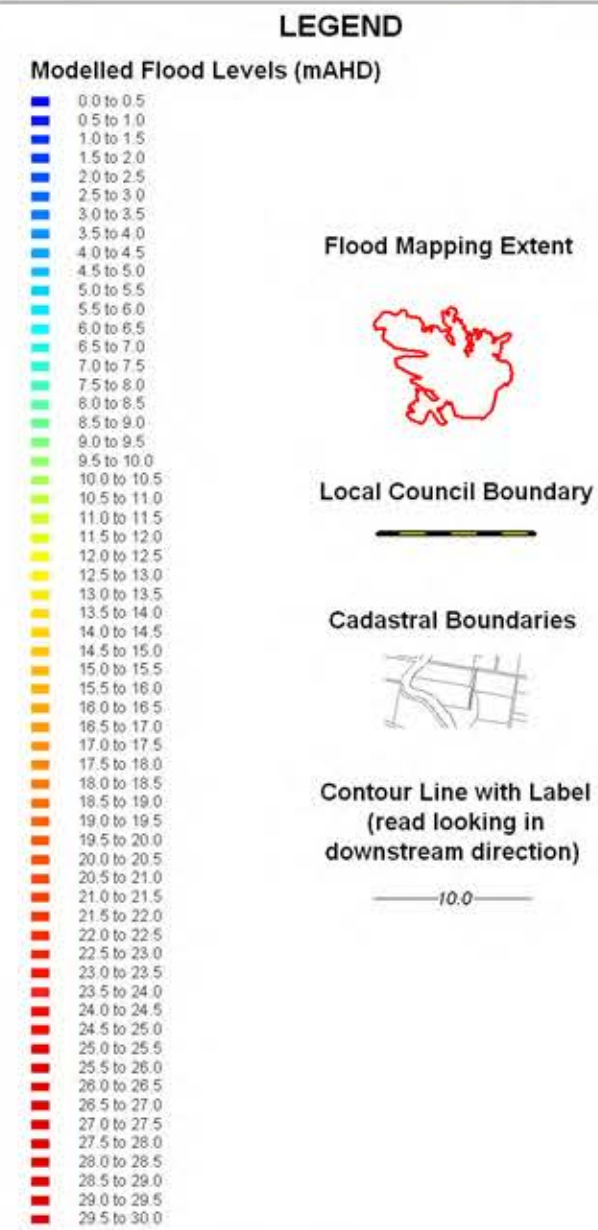
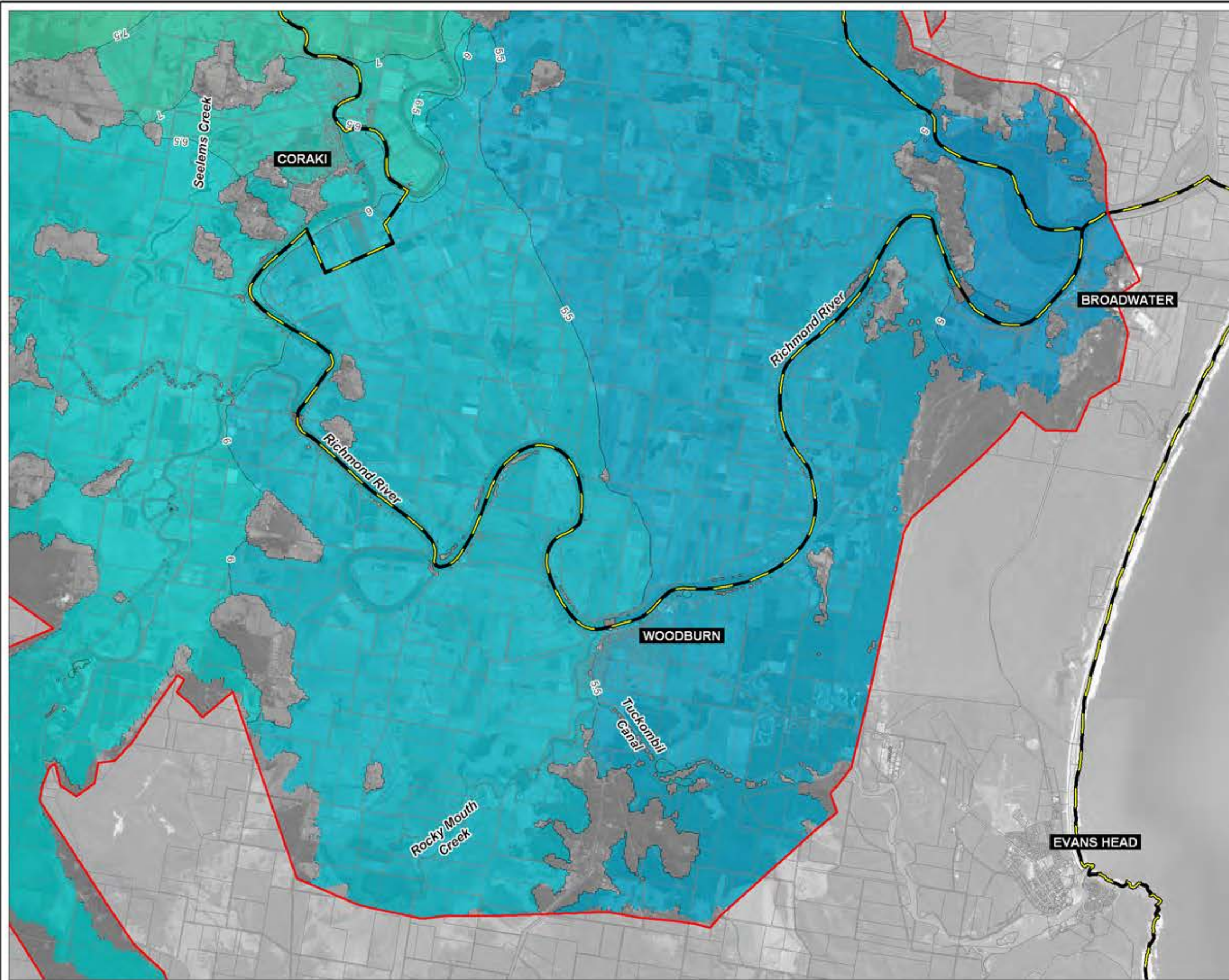
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Map: 6-30
 Rev: C



Filepath : I:\B16784_I_BMC_RichmondMegaModel\DRG\FLD_065_100315_0100yrCC2_Levels_RevC.wor



1. Actual flood events can significantly differ from the design flood events presented here. The flood behaviour shown is predicted to occur during a typical design flood event, under the physical and topographic conditions prevailing at the time of preparation.
2. The approximate extent of land liable to flooding is based on survey data available at the time of preparation. Refer to Volume 1 of the Richmond River Flood Mapping Study for details of the survey data used.
3. Local flooding of other areas, or in excess of the levels shown, may occur. The extent of flooding shown relates primarily to long duration rainfall events. Shorter duration events leading to flash flooding may result in higher localised flood levels and velocities in some areas.
4. Local increases in flood levels, depths, and/or velocities from those shown may result from local factors such as full or partial blockages of drainage structures, and obstructions to overland flows such as changes to agricultural characteristics, farm levees and drains, fences and buildings.

Title:
100 Year ARI Peak Flood Levels - Climate Change Scenario 2 - Sheet 4
Richmond River (Coraki to Broadwater), Rocky Mouth Creek and Tuckombil Canal

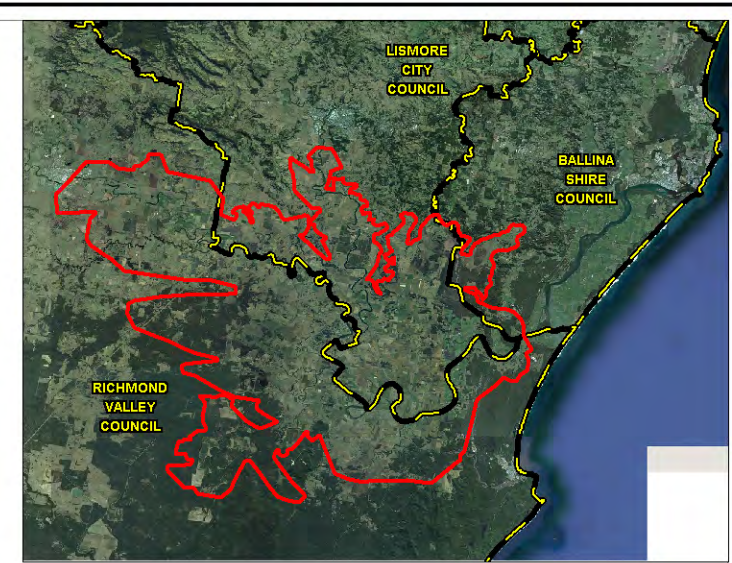
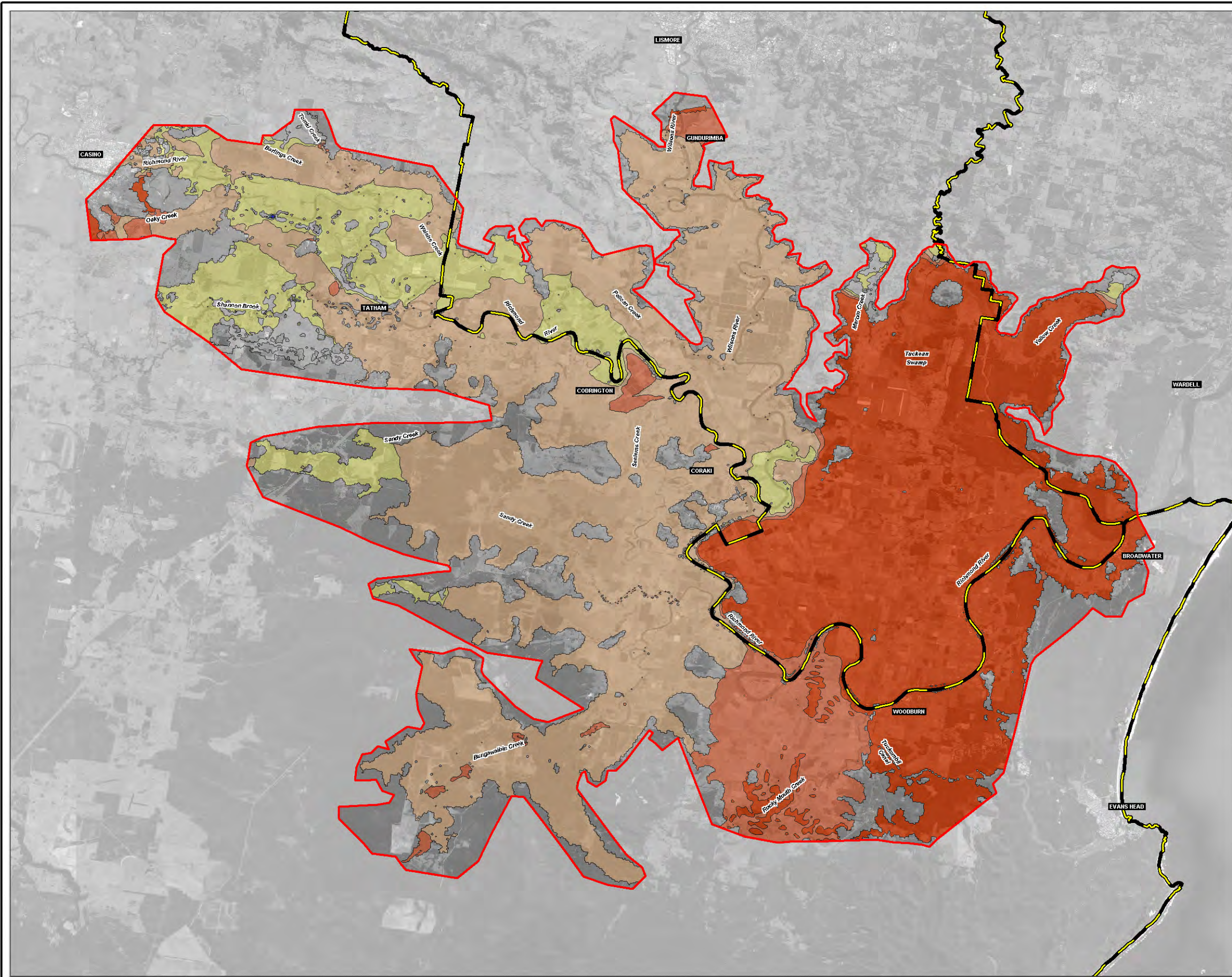
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Map: 6-31
 Rev: C



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LEGEND

Flood Impact (m)

- < -0.50
- -0.50 to -0.25
- -0.25 to -0.10
- -0.10 to 0.10
- 0.10 to 0.25
- 0.25 to 0.50
- 0.50 to 0.75
- > 0.75

Flood Depth Mapping Extent

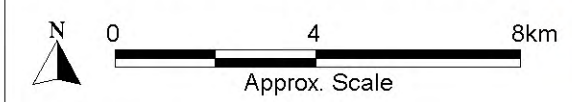
Local Council Boundary



1. Actual flood events can significantly differ from the design flood events presented here. The flood behaviour shown is predicted to occur during a typical design flood event, under the physical and topographic conditions prevailing at the time of preparation.
2. The approximate extent of land liable to flooding is based on survey data available at the time of preparation. Refer to Volume 1 of the Richmond River Flood Mapping Study for details of the survey data used.
3. Local flooding of other areas, or in excess of the levels shown, may occur. The extent of flooding shown relates primarily to long duration rainfall events. Shorter duration events leading to flash flooding may result in higher localised flood levels and velocities in some areas.
4. Local increases in flood levels, depths, and/or velocities from those shown may result from local factors such as full or partial blockages of drainage structures, and obstructions to overland flows such as changes to agricultural characteristics, farm levees and drains, fences and buildings.

Title:
100 Year ARI Increase in Peak Flood Levels - Climate Change Scenario 2 (0.9m Sea Level Rise and 20% Rainfall Increase)

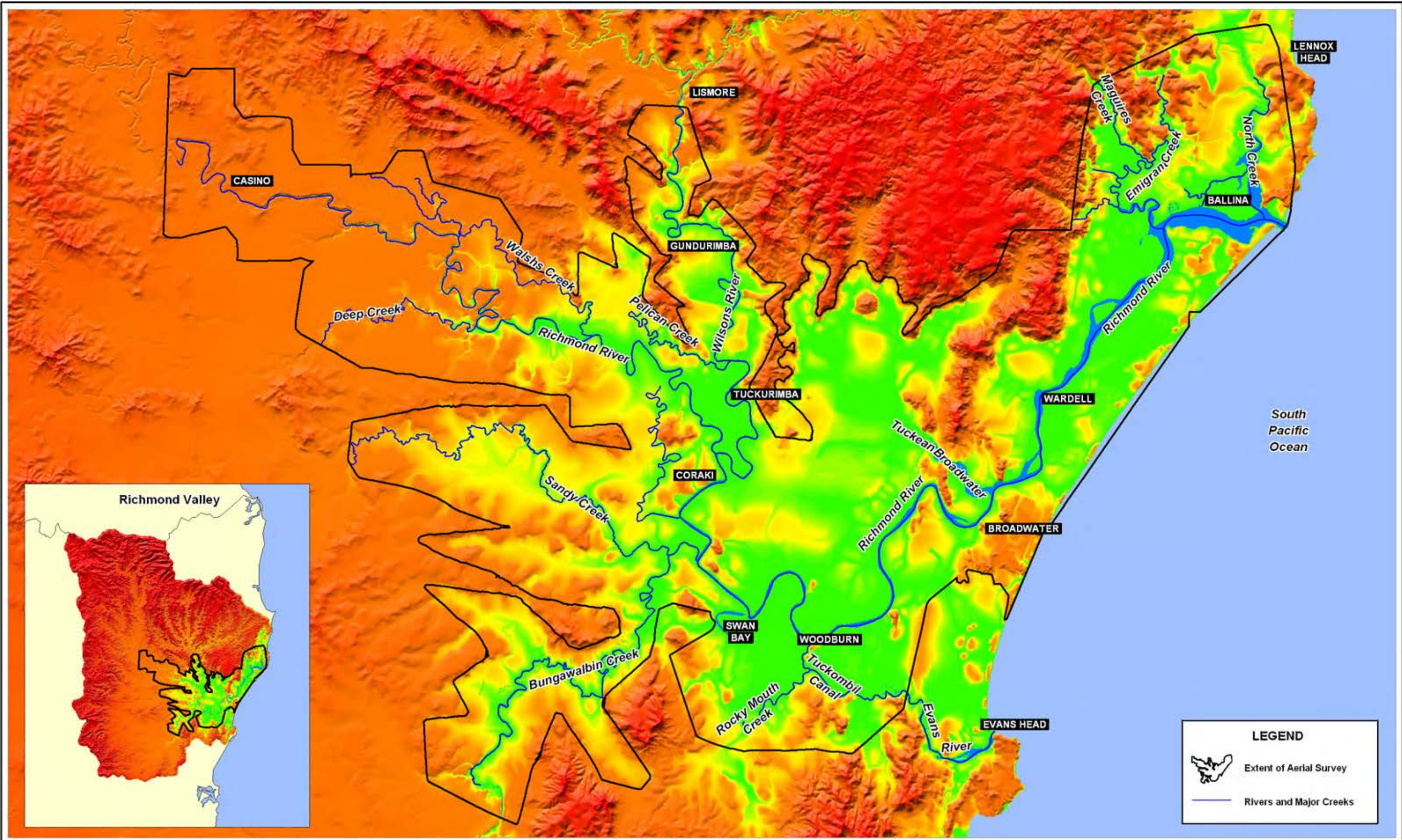
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Map: **6-32** Rev: **B**

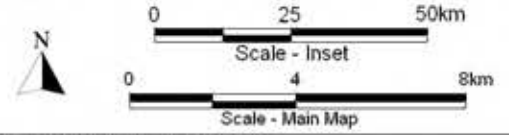


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Title:
Richmond River Flood Mapping Study
Study Area

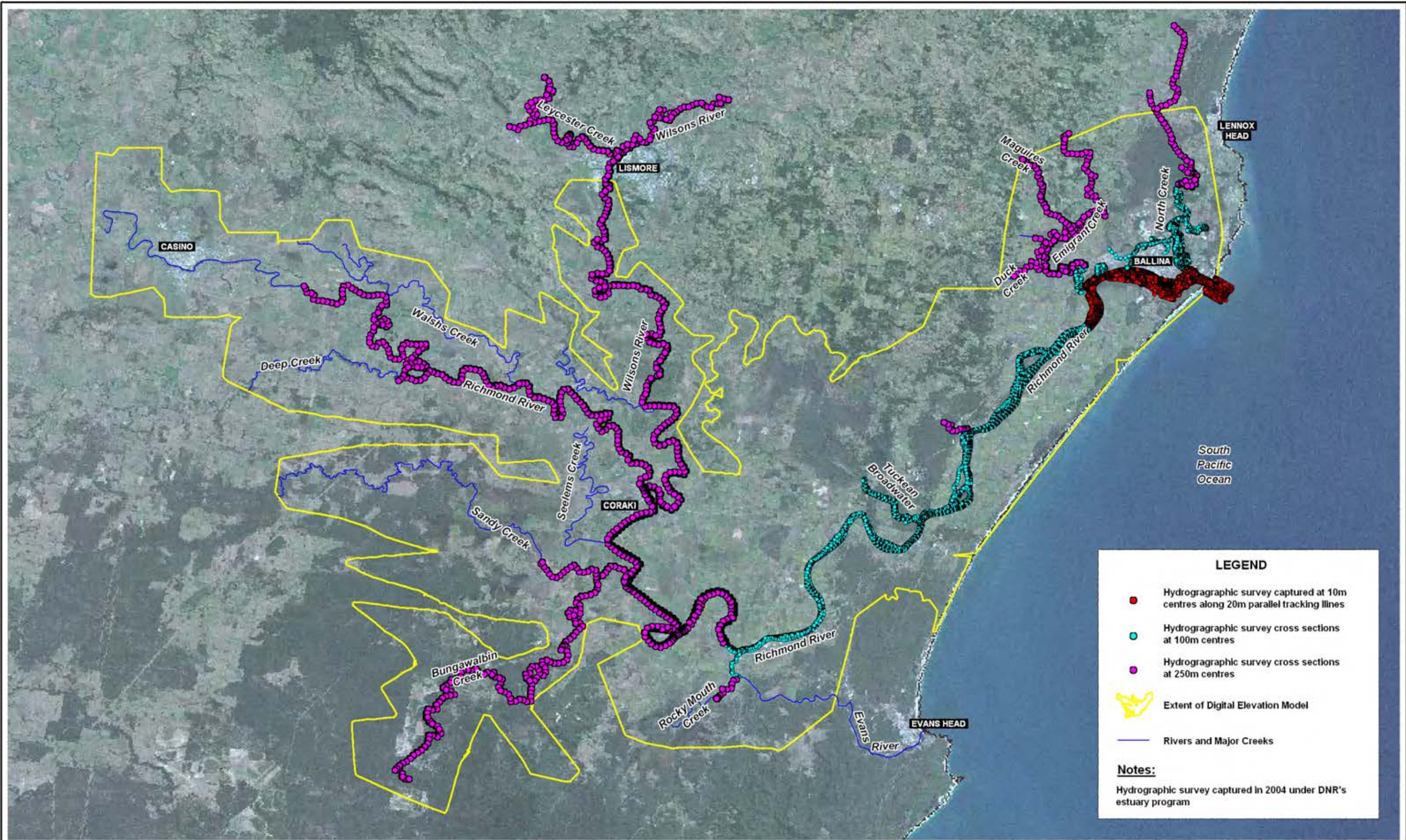
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Map:	Rev:
A1-1	A



Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRG\FLD_011_080902_Richmond_DEM.wor



LEGEND

- Hydrographic survey captured at 10m centres along 20m parallel tracking lines
- Hydrographic survey cross sections at 100m centres
- Hydrographic survey cross sections at 250m centres
- ▭ Extent of Digital Elevation Model
- Rivers and Major Creeks

Notes:
Hydrographic survey captured in 2004 under DNR's estuary program



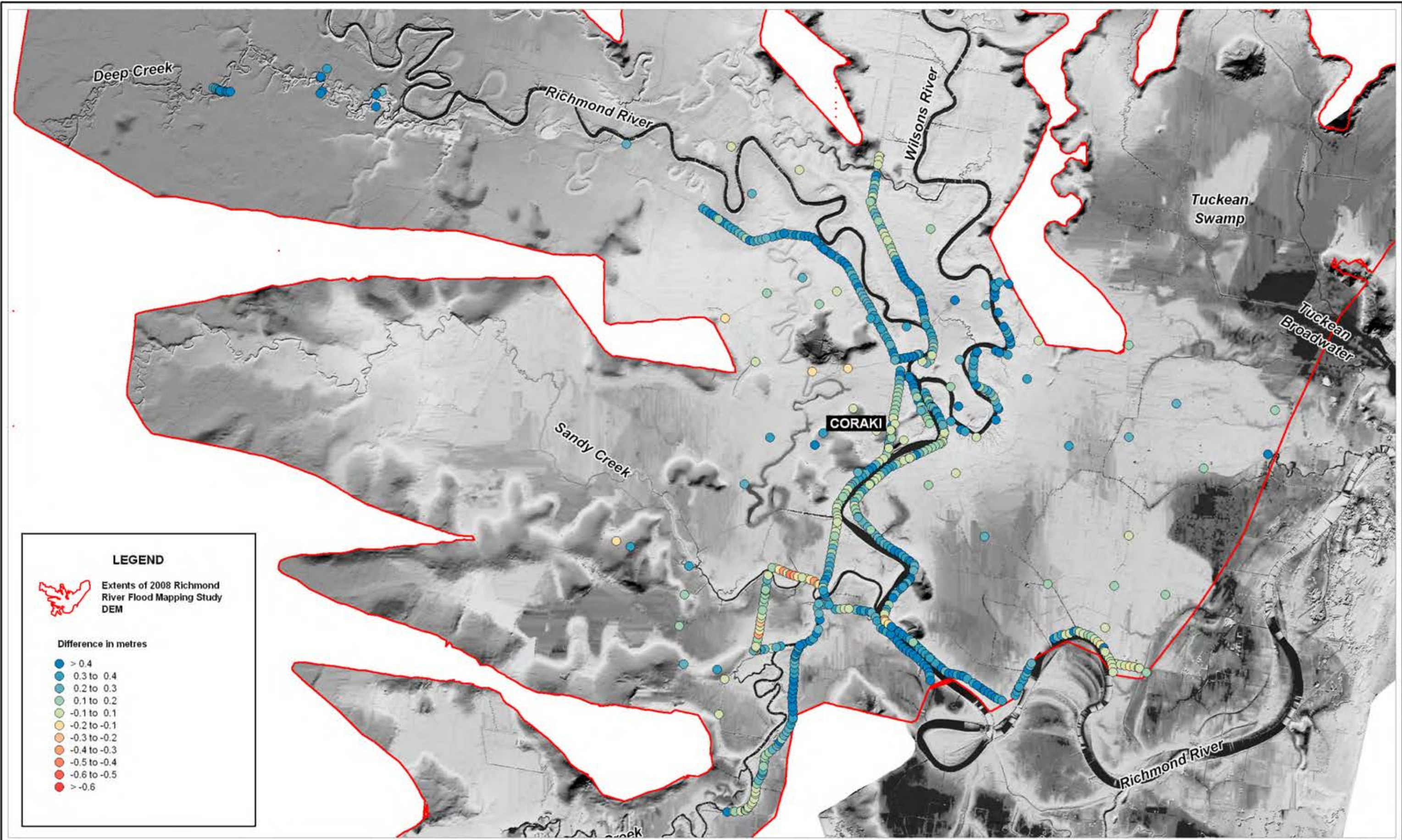
Title:
**Richmond River Flood Mapping Study
Hydrographic Survey Extents**

Map: **A2-1** Rev: **A**


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Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRGIFLD_012_080902_Richmond_Hydro_Survey_Extents.wor



LEGEND

 Extents of 2008 Richmond River Flood Mapping Study DEM

Difference in metres

-  > 0.4
-  0.3 to 0.4
-  0.2 to 0.3
-  0.1 to 0.2
-  -0.1 to 0.1
-  -0.2 to -0.1
-  -0.3 to -0.2
-  -0.4 to -0.3
-  -0.5 to -0.4
-  -0.6 to -0.5
-  > -0.6



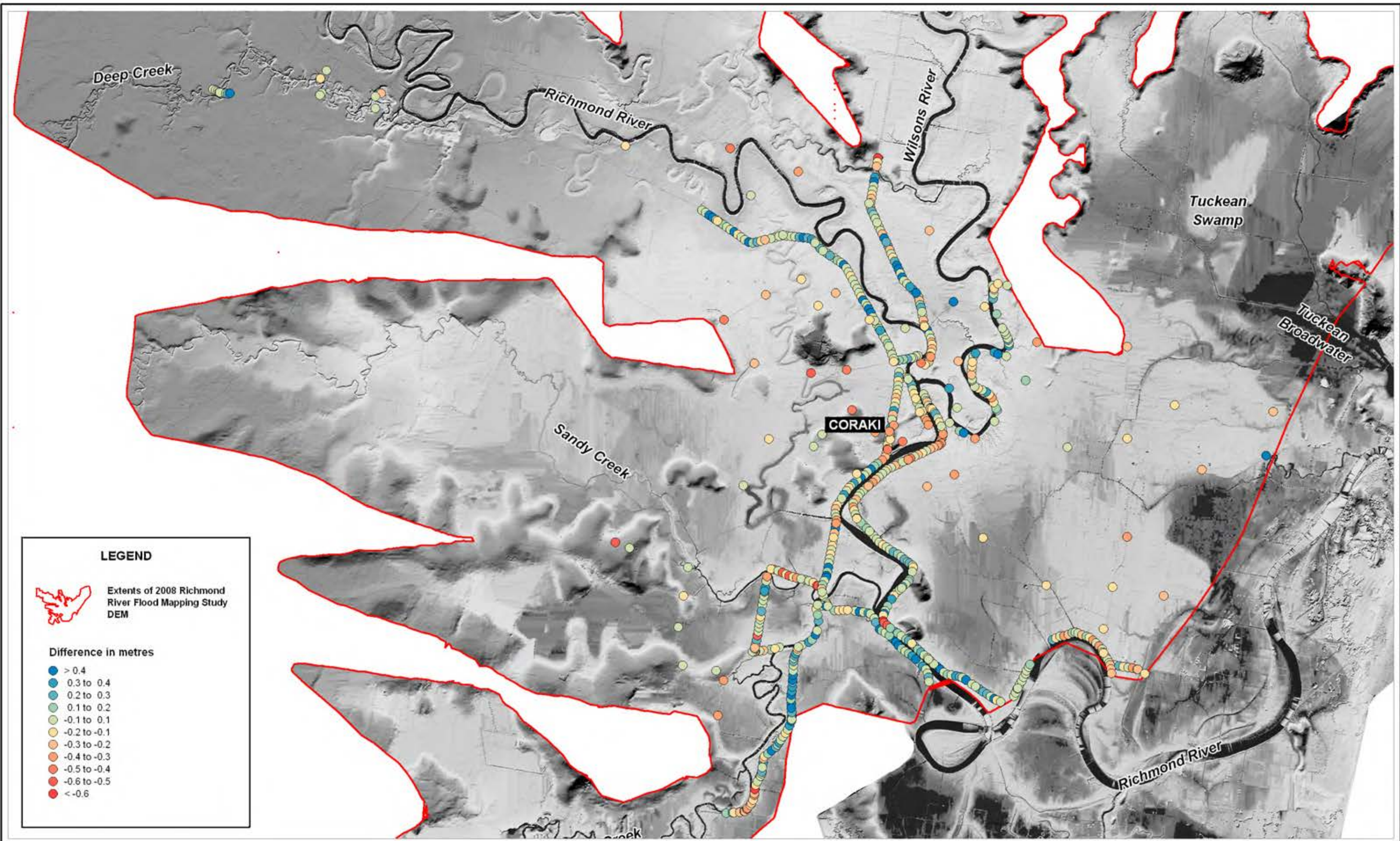
Title:
Thematic Map of Residuals Between 1998 Ground Survey and Original Photogrammetry

Map: A3-1
 Rev: A


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Filepath : I:\B16784_I_BMC_RichmondMegaModeNDRG\FLD_014_080912_1998_survey_thematic_mapping.wor



LEGEND

 Extents of 2008 Richmond River Flood Mapping Study DEM

Difference in metres

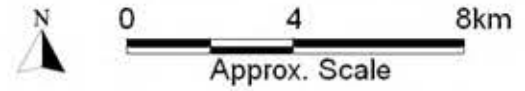
-  > 0.4
-  0.3 to 0.4
-  0.2 to 0.3
-  0.1 to 0.2
-  -0.1 to 0.1
-  -0.2 to -0.1
-  -0.3 to -0.2
-  -0.4 to -0.3
-  -0.5 to -0.4
-  -0.6 to -0.5
-  < -0.6



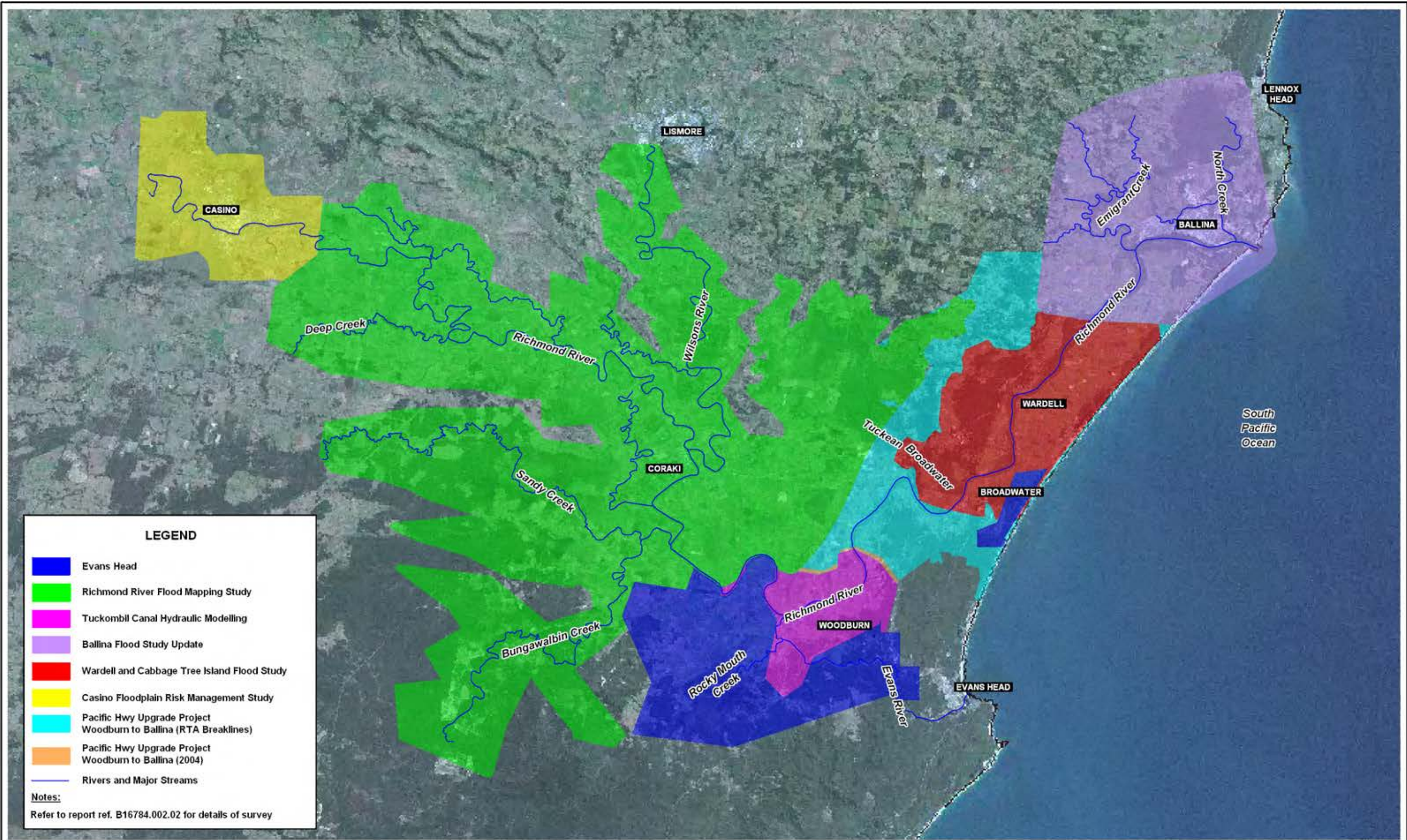
Title:
Thematic Map of Residuals Between 1998 Ground Survey and Elevated Photogrammetry

Map: A3-2
 Rev: A

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Filepath : I:\B16784_I_BMC_RichmondMegaMode\DRG\FLD_015_080912_1998_survey_thematic_mapping_elevated.wor



LEGEND

- Evans Head
- Richmond River Flood Mapping Study
- Tuckombil Canal Hydraulic Modelling
- Ballina Flood Study Update
- Wardell and Cabbage Tree Island Flood Study
- Casino Floodplain Risk Management Study
- Pacific Hwy Upgrade Project Woodburn to Ballina (RTA Breaklines)
- Pacific Hwy Upgrade Project Woodburn to Ballina (2004)
- Rivers and Major Streams

Notes:
Refer to report ref. B16784.002.02 for details of survey



Title:
**Richmond River Flood Mapping Study
Digital Elevation Model Composition**

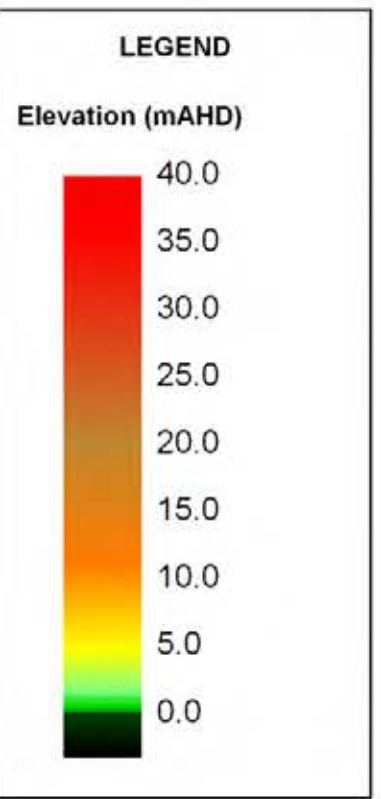
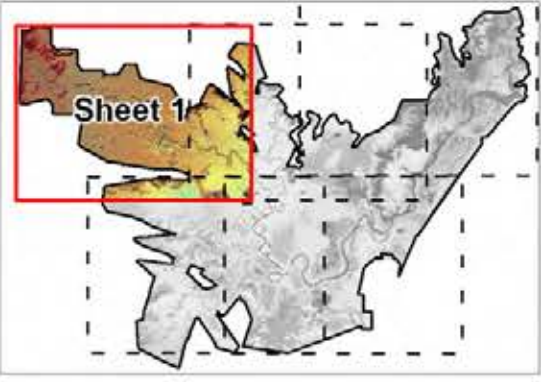
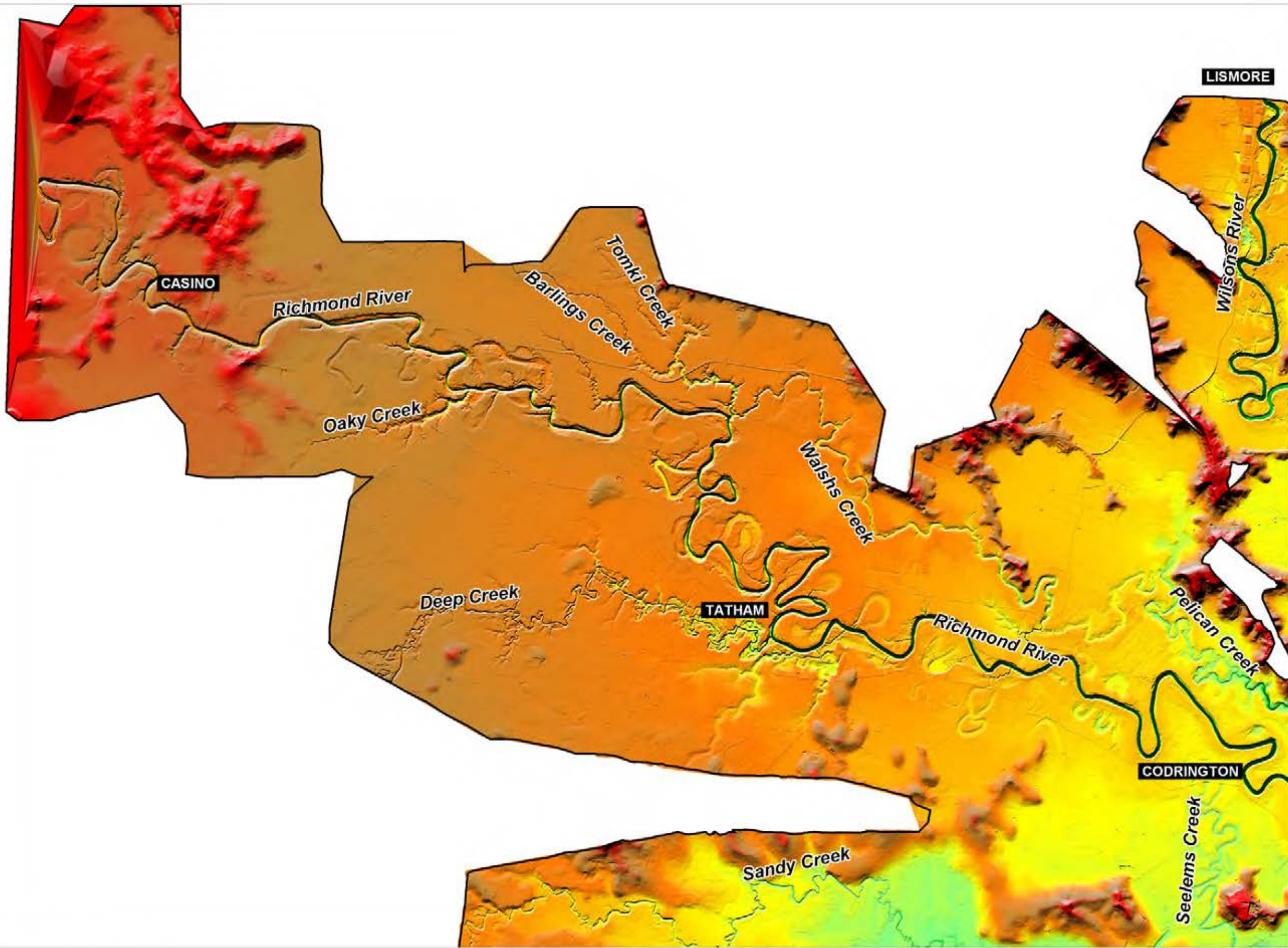
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Map A4-1	Rev: B
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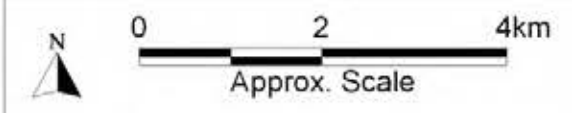
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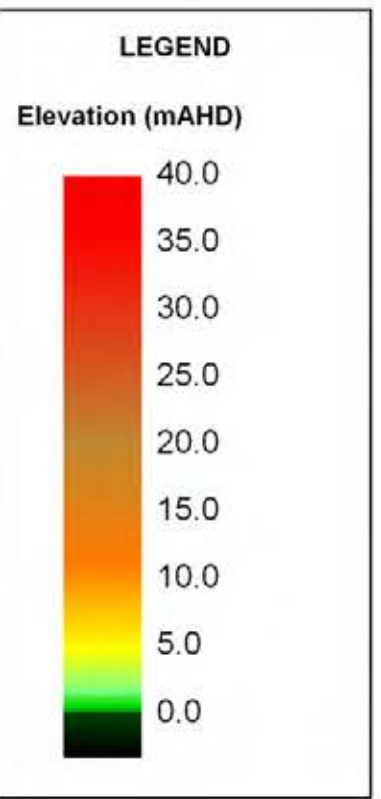
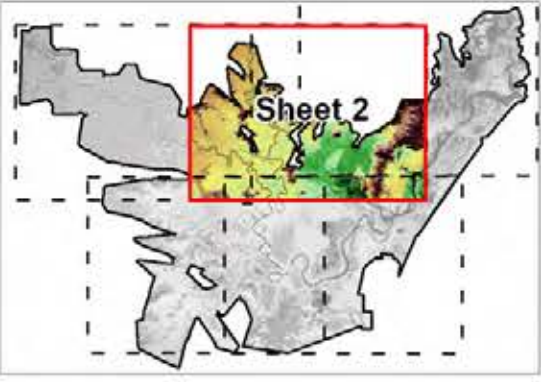
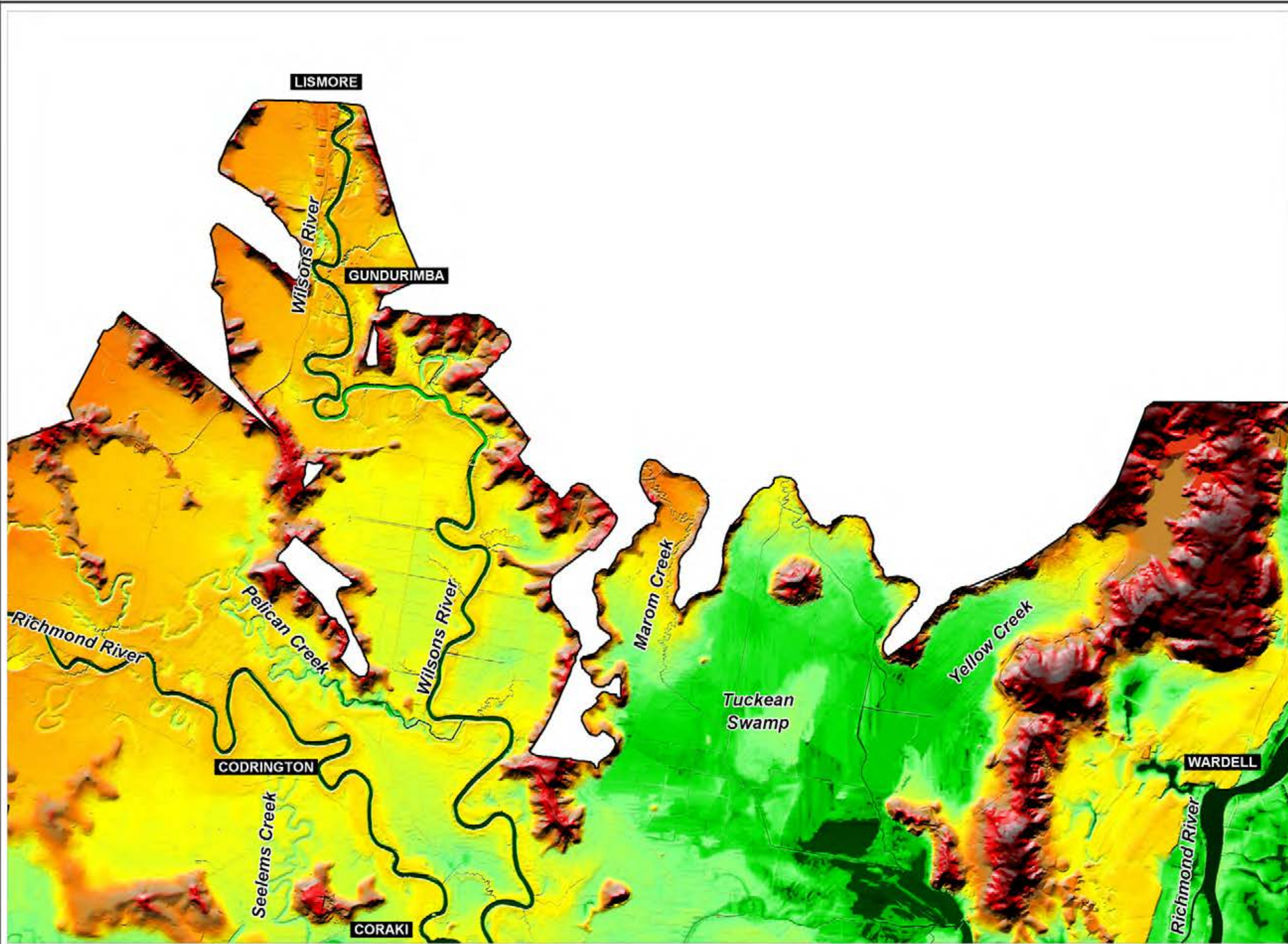
Title:
Richmond River Flood Mapping Study - Digital Elevation Model - Sheet 1
Richmond River (Casino to Codrington) and Deep Creek

Map: **A4-2** Rev: **B**

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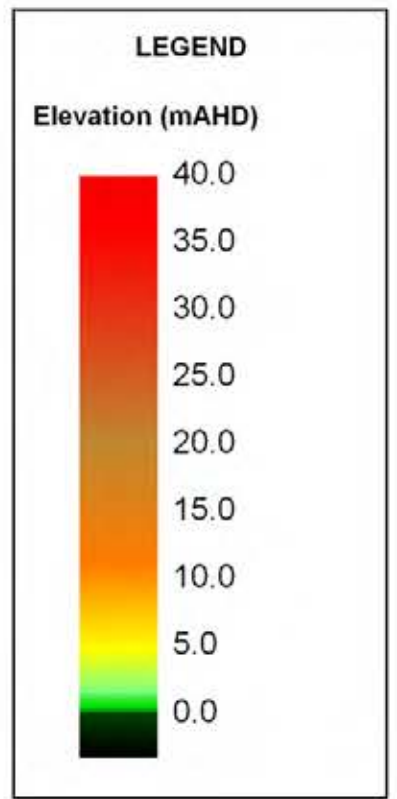
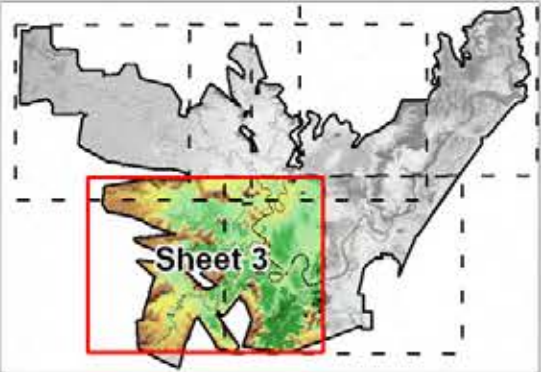
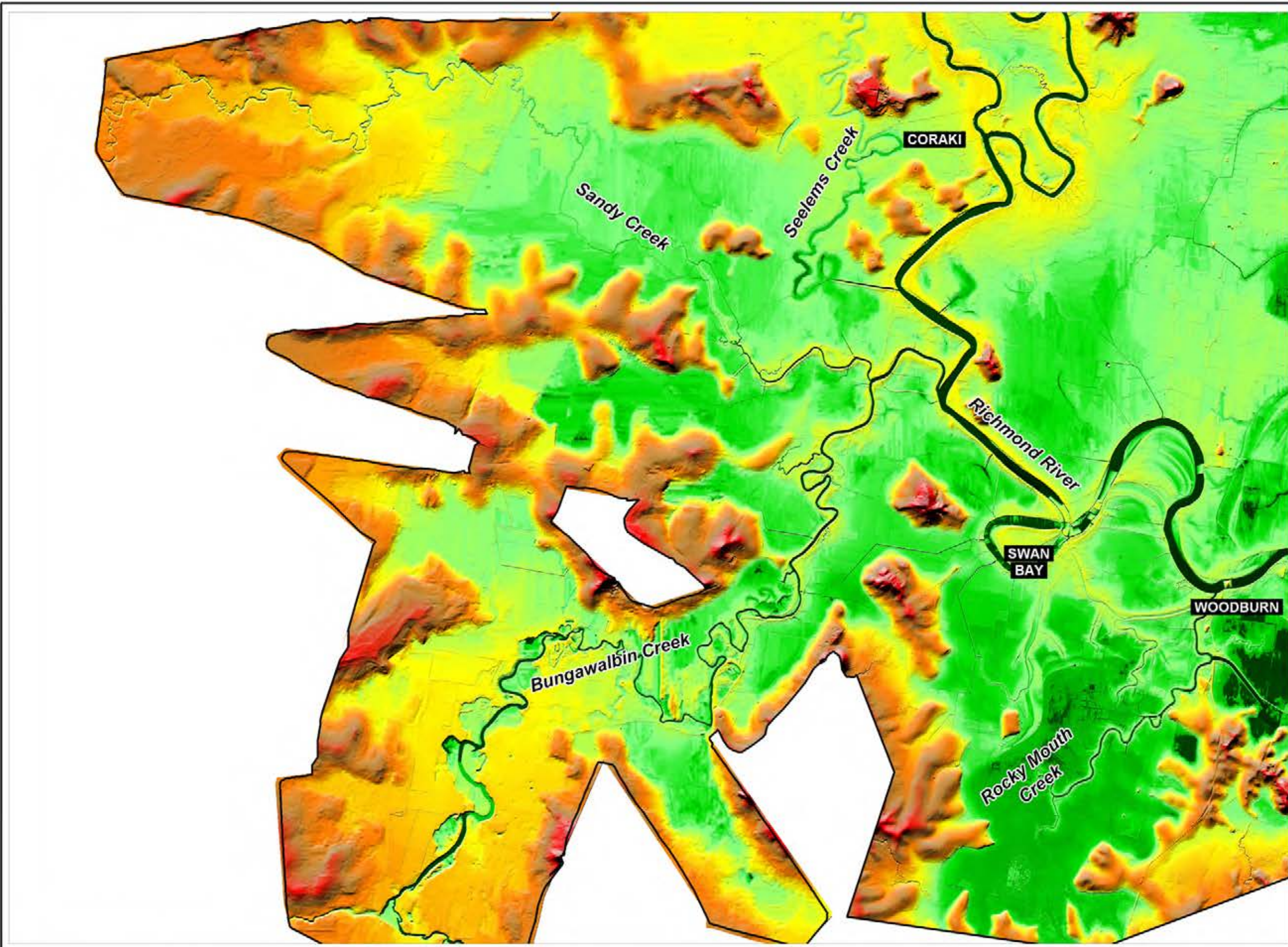
Title:
Richmond River Flood Mapping Study - Digital Elevation Model - Sheet 2
 Richmond River (Codrington to Coraki), Wilsons River and Tuckean Swamp

Map: **A4-3** Rev: **B**

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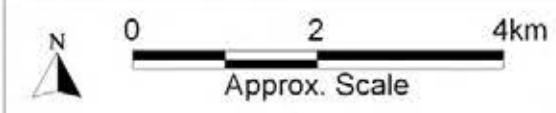
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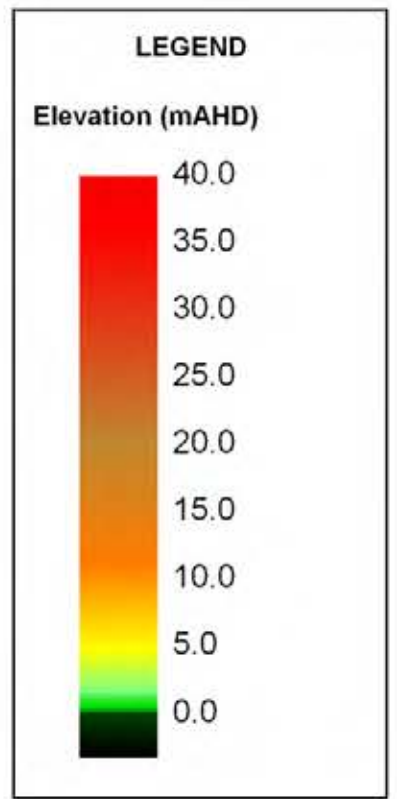
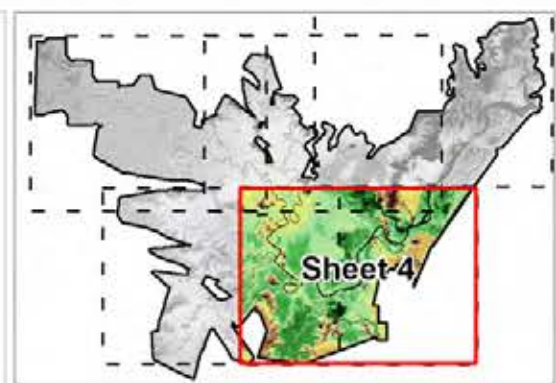
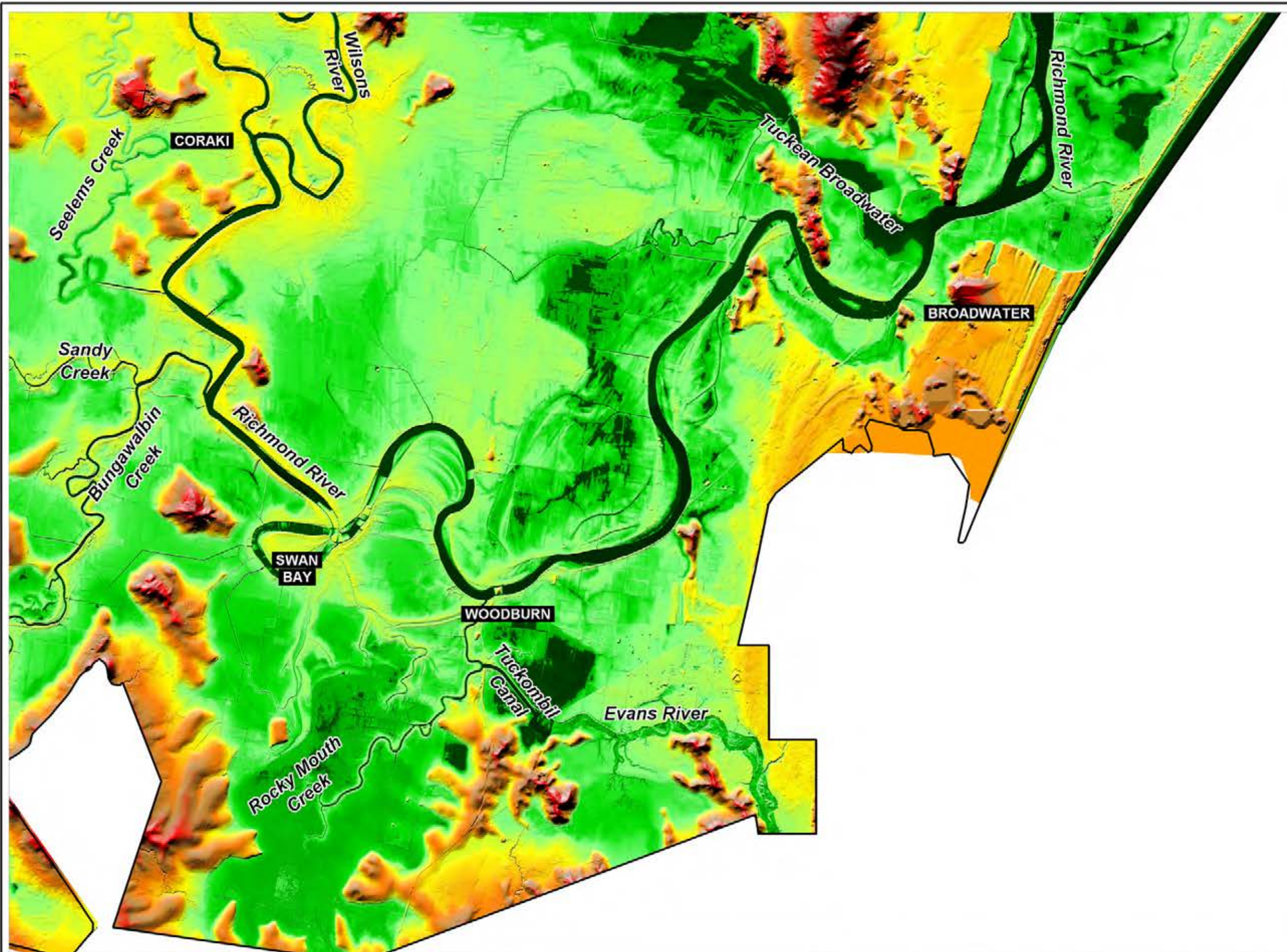
Title:
Richmond River Flood Mapping Study - Digital Elevation Model - Sheet 3
 Richmond River (Coraki to Woodburn), Bungawalbin and Sandy Creeks

Map: **A4-4** Rev: **B**

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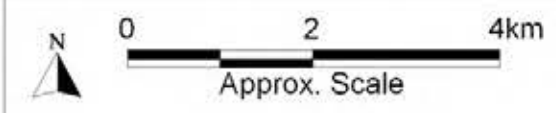
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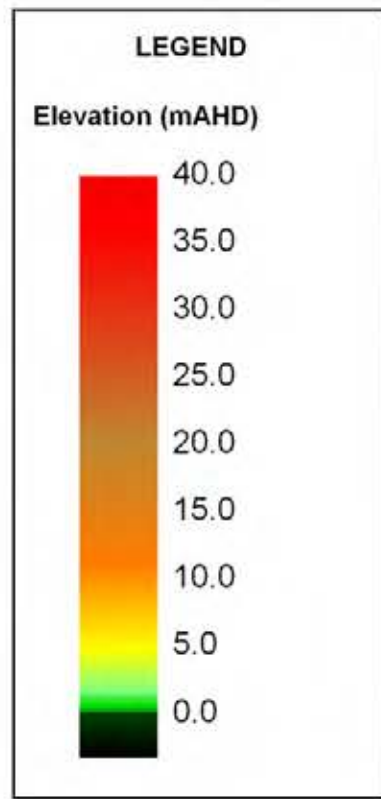
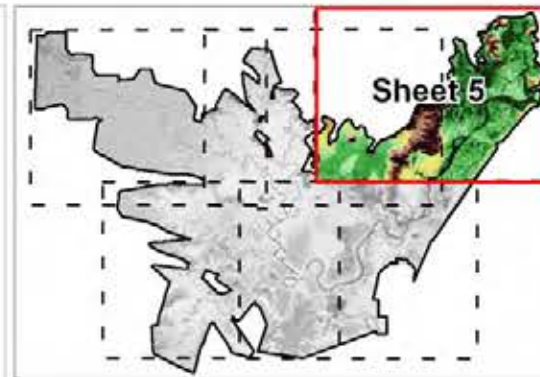
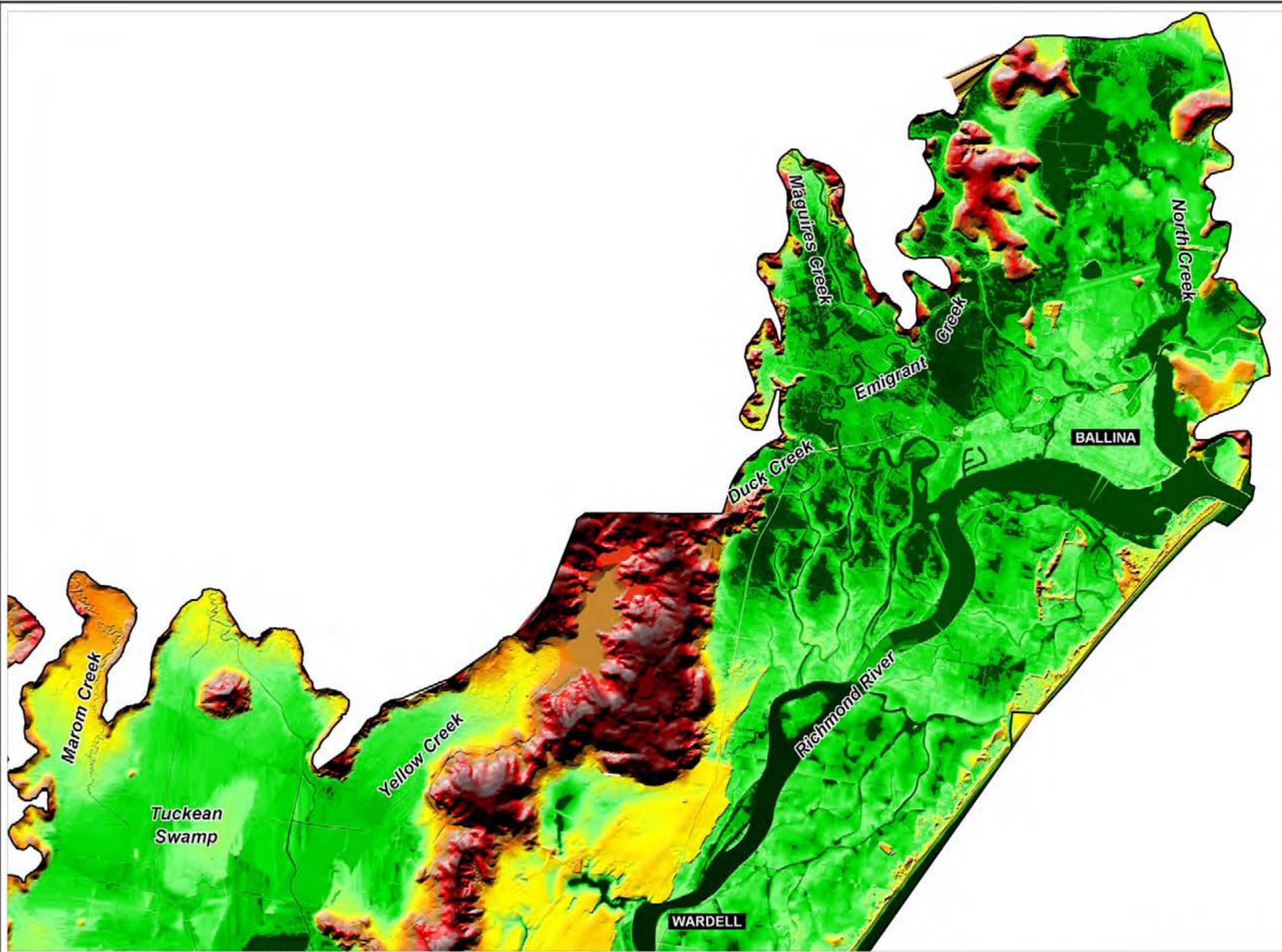
Title:
Richmond River Flood Mapping Study - Digital Elevation Model - Sheet 4
 Richmond River (Coraki to Broadwater), Rocky Mouth Ck and Evans River

Map: **A4-5** Rev: **B**

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Title:
Richmond River Flood Mapping Study - Digital Elevation Model - Sheet 5
 Lower Richmond River (Wardell to Ballina)

Map: **A4-6** Rev: **B**

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