

- LEGEND**
- Model Extent
 - Peak Flood Level Contours (m AHD)
(0.1m interval for 1.0 to 6.0m AHD then 1.0m interval for 6.0 to 30.0m AHD)
 - Pacific Highway (approximate location)
 - Cadastral Boundaries

Title:
**20 Year ARI Peak Flood Levels
Cudgen/Cudgera Creeks Catchments**

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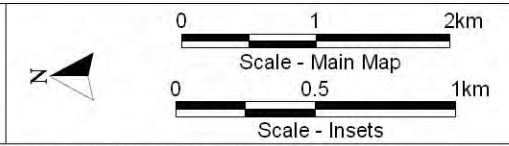
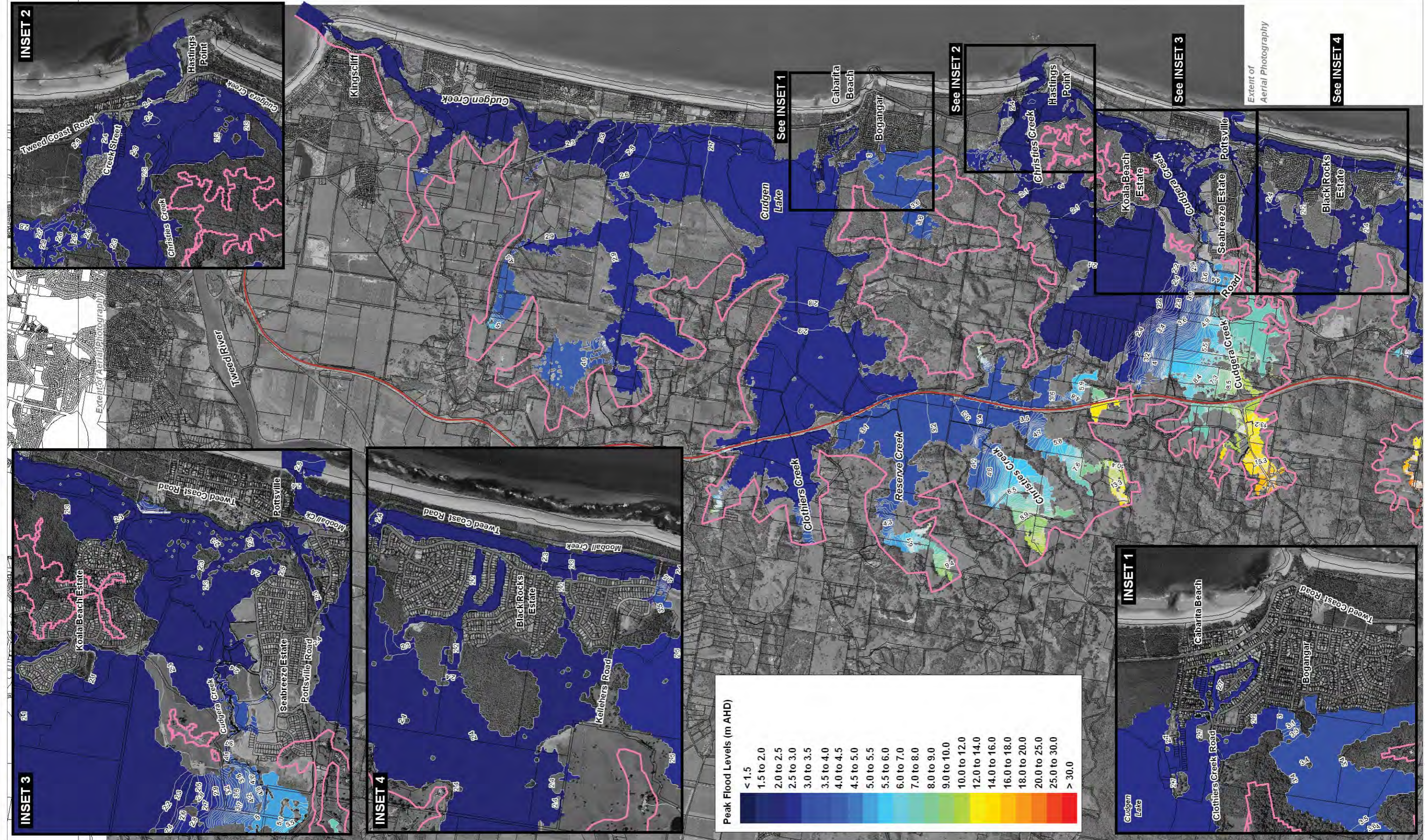


Figure:
Flood Map 7

Rev:
B





LEGEND

- Model Extent
- Peak Flood Level Contours (m AHD)
(0.1m interval for 1.0 to 6.0m AHD then 1.0m interval for 6.0 to 30.0m AHD)
- Pacific Highway (approximate location)
- Cadastral Boundaries



Title:
**50 Year ARI Peak Flood Levels
Cudgen/Cudgera Creeks Catchments**

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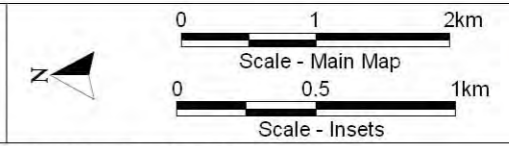
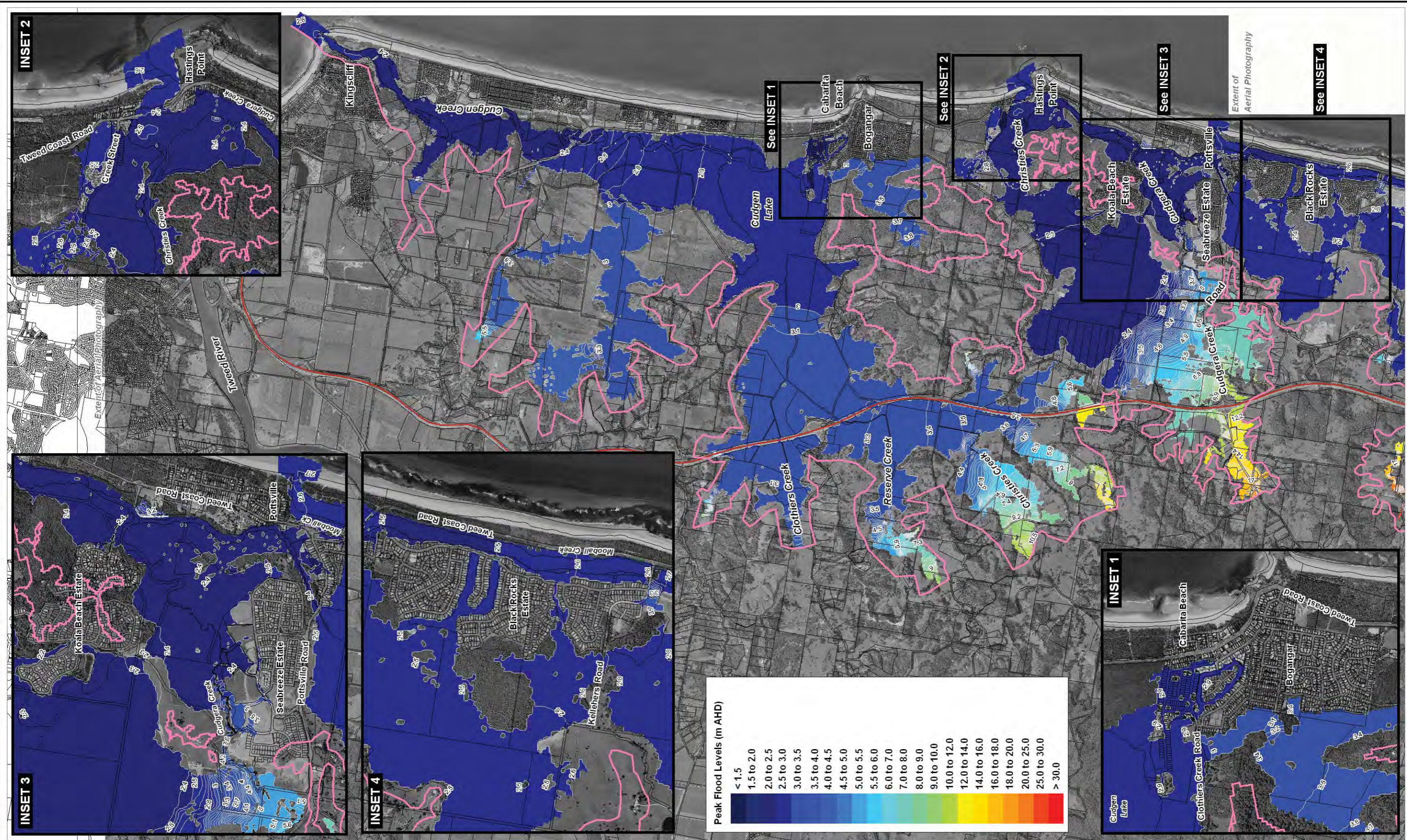


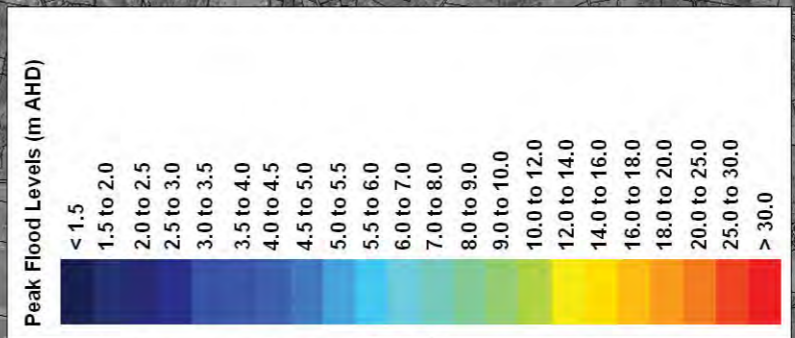
Figure:
Flood Map 10

Rev:
B





- LEGEND**
- Model Extent
 - Peak Flood Level Contours (m AHD)
(0.1m interval for 1.0 to 6.0m AHD then 1.0m interval for 6.0 to 30.0m AHD)
 - Pacific Highway (approximate location)
 - Cadastral Boundaries



Title:
**100 Year ARI Peak Flood Levels
Cudgen/Cudgera Creeks Catchments**

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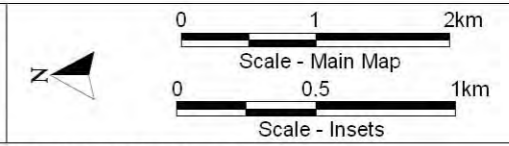
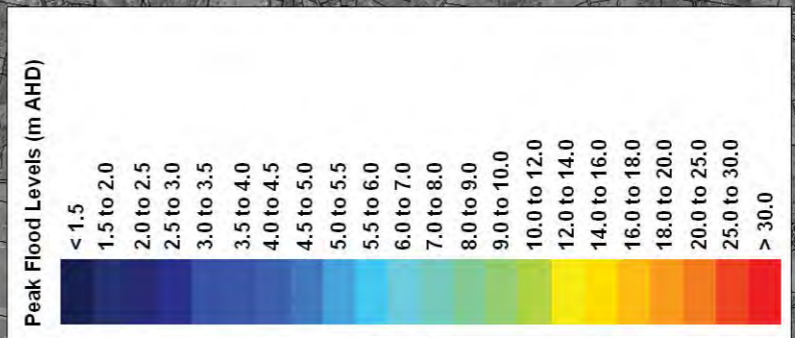
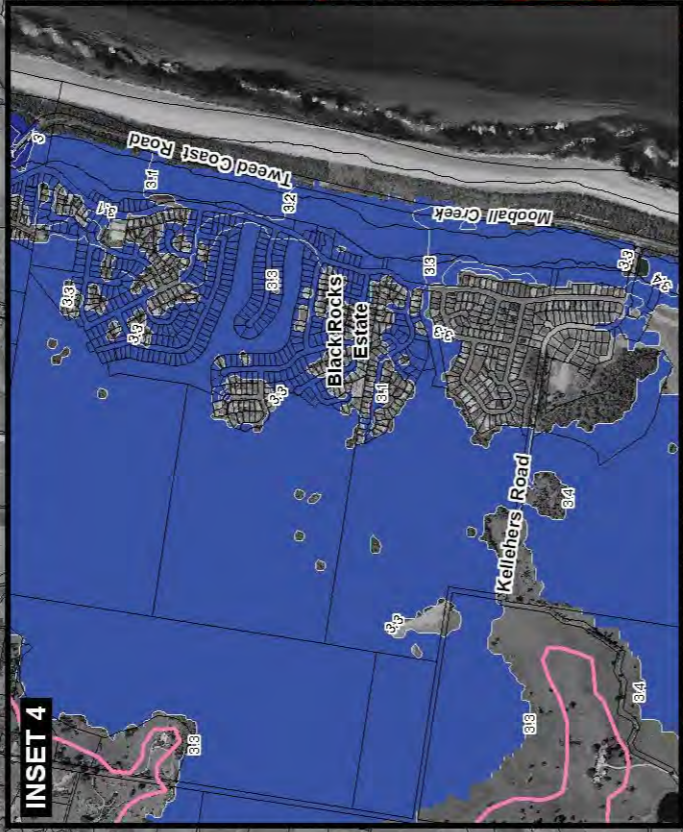
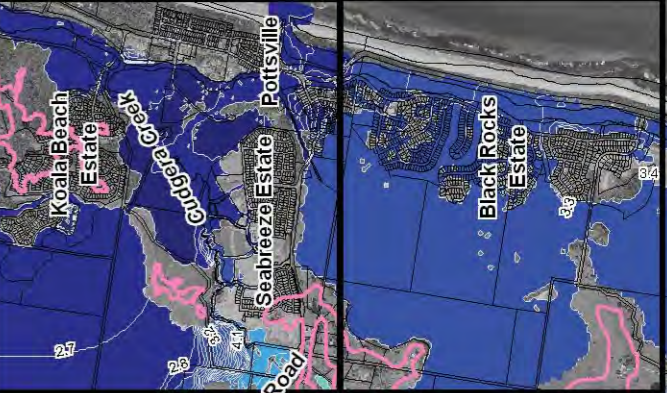
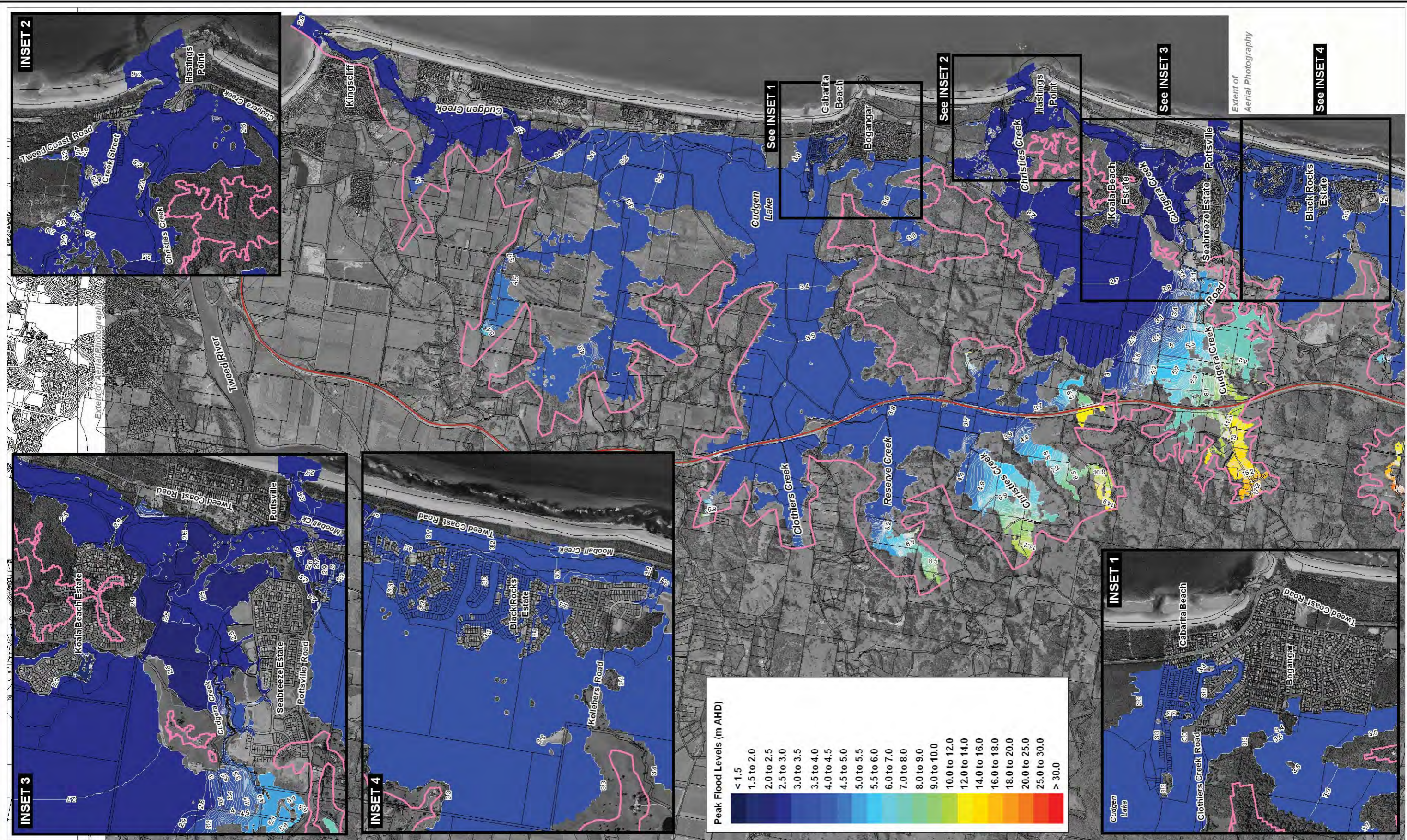


Figure:
Flood Map 13

Rev:
B





- LEGEND**
- Model Extent
 - Peak Flood Level Contours (m AHD)
(0.1m interval for 1.0 to 6.0m AHD then 1.0m interval for 6.0 to 30.0m AHD)
 - Pacific Highway (approximate location)
 - Cadastral Boundaries

Title:
**500 Year ARI Peak Flood Levels
Cudgen/Cudgera Creeks Catchments**

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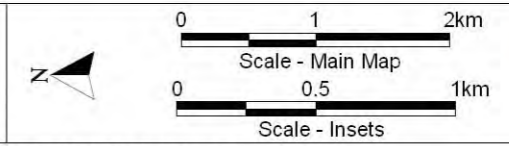
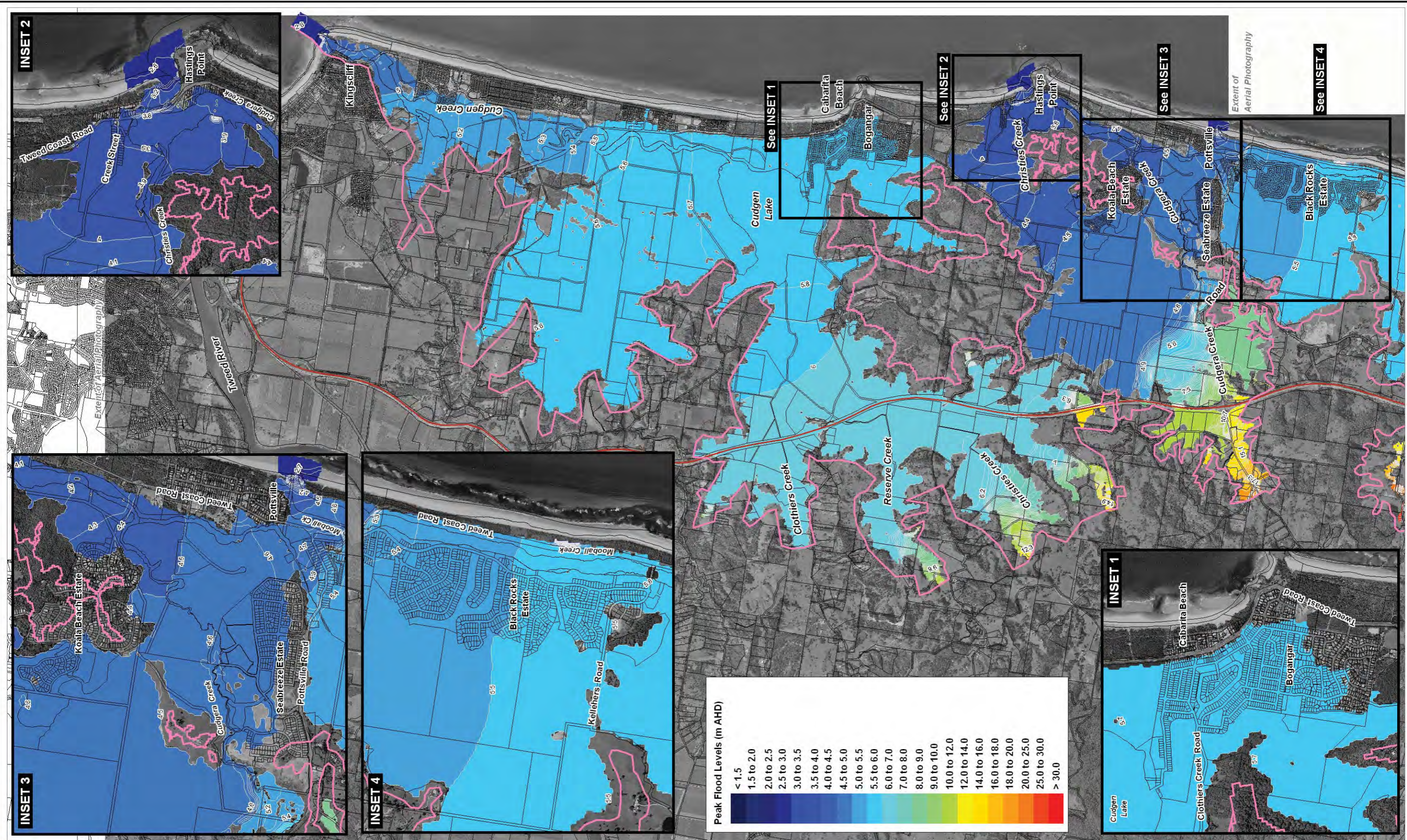


Figure:
Flood Map 16

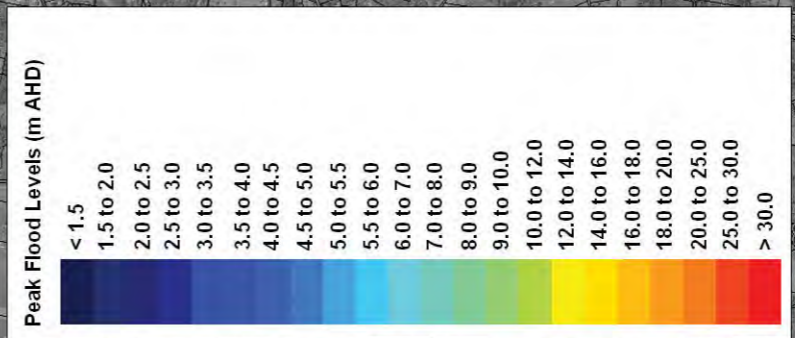
Rev:
B





LEGEND

- Model Extent
- Peak Flood Level Contours (m AHD)
(0.1m interval for 1.0 to 6.0m AHD then 1.0m interval for 6.0 to 30.0m AHD)
- Pacific Highway (approximate location)
- Cadastral Boundaries



Title:
**Probable Maximum Flood Peak Levels
Cudgen/Cudgera Creeks Catchments**

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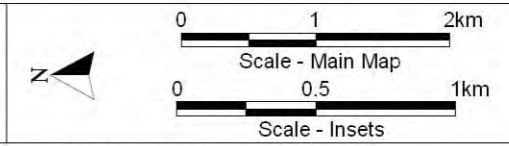


Figure:
Flood Map 19

Rev:
A



13 Appendix 5 – Tabulated TUFLOW model results

13.1 Appendix 5.1 Water surface levels and impacts

Table A5.1.1 Peak flood levels and critical storm durations – 100 year ARI design event

Reporting Point ID	Existing Case		Developed Case		
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	Impact (m)
Cudgen Creek (downstream of site discharge)					
A	2.418	24hr H	2.419	24hr H	0.000
B	2.553	Q 36hr	2.553	Q 36hr	0.000
C	2.743	Q 36hr	2.742	Q 36hr	-0.001
Kings Forest local catchment					
D	2.769	Q 36hr	2.765	Q 36hr	-0.004
E	2.771	Q 36hr	2.777	Q 36hr	0.006
F	2.771	Q 36hr	2.778	Q 36hr	0.006
G	2.772	Q 36hr	2.783	Q 36hr	0.011
H	2.774	Q 36hr	2.785	Q 36hr	0.011
I	2.795	Q 36hr	2.797	Q 36hr	0.002
J	4.136	Q 6hr	4.105	Q 24hr	-0.031
K	4.411	Q 24hr	4.409	Q 24hr	-0.002
L	4.327	Q 24hr	4.296	Q 24hr	-0.031
M	3.484	Q 24hr	3.496	Q 24hr	0.012
N	3.310	Q 24hr	3.323	Q 24hr	0.013
O	2.794	Q 36hr	2.824	Q 36hr	0.030
Cudgen Creek (upstream of site discharge)					
P	2.868	Q 36hr	2.868	Q 36hr	0.000
Q	2.922	Q 36hr	2.922	Q 36hr	0.000
R	2.935	Q 36hr	2.934	Q 36hr	0.000
S	2.936	Q 36hr	2.936	Q 36hr	0.000

Note: Flood level envelope includes (a) 100 year ARI catchment runoff with 20 year ARI storm surge boundary, denoted by 'Q duration', and (b) 100 year ARI storm surge boundary with 10 year ARI catchment runoff, denoted by 'duration H'.

Table A5.1.2 Peak flood levels and critical storm durations – 50 year ARI design event

Reporting Point ID	Existing Case		Developed Case		
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	Impact (m)
Cudgen Creek (downstream of site discharge)					
A	2.328	24hr H	2.328	24hr H	0.000
B	2.273	Q 36hr	2.271	Q 36hr	-0.001
C	2.551	Q 36hr	2.549	Q 36hr	-0.002
Kings Forest local catchment					
D	2.600	Q 36hr	2.589	Q 36hr	-0.010
E	2.602	Q 36hr	2.608	Q 36hr	0.006
F	2.604	Q 36hr	2.610	Q 36hr	0.006
G	2.605	Q 36hr	2.620	Q 36hr	0.015
H	2.610	Q 36hr	2.624	Q 36hr	0.014
I	2.653	Q 36hr	2.644	Q 36hr	-0.008
J	4.097	Q 6hr	4.066	Q 24hr	-0.031
K	4.384	Q 24hr	4.382	Q 24hr	-0.001
L	4.267	Q 24hr	4.231	Q 24hr	-0.035
M	3.452	Q 24hr	3.464	Q 24hr	0.012
N	3.282	Q 24hr	3.292	Q 24hr	0.009
O	2.741	Q 24hr	2.750	Q 24hr	0.009
Cudgen Creek (upstream of site discharge)					
P	2.677	Q 36hr	2.677	Q 36hr	0.000
Q	2.726	Q 36hr	2.726	Q 36hr	0.000
R	2.738	Q 36hr	2.738	Q 36hr	0.000
S	2.739	Q 36hr	2.739	Q 36hr	0.000

Note: Flood level envelope includes (a) 50 year ARI catchment runoff with 10 year ARI storm surge boundary, denoted by 'Q duration', and (b) 50 year ARI storm surge boundary with 10 year ARI catchment runoff, denoted by 'duration H'.

Table A5.1.3 Peak flood levels and critical storm durations – 20 year ARI design event

Reporting Point ID	Existing Case		Developed Case		Impact (m)
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	
Cudgen Creek (downstream of site discharge)					
A	2.116	24hr H	2.116	24hr H	0.000
B	2.053	Q 36hr	2.050	Q 36hr	-0.003
C	2.336	Q 36hr	2.333	Q 36hr	-0.003
Kings Forest local catchment					
D	2.410	Q 36hr	2.390	Q 36hr	-0.019
E	2.413	Q 36hr	2.411	Q 36hr	-0.002
F	2.414	Q 36hr	2.413	Q 36hr	-0.002
G	2.417	Q 36hr	2.428	Q 36hr	0.012
H	2.422	Q 36hr	2.432	Q 36hr	0.010
I	2.518	Q 36hr	2.472	Q 36hr	-0.046
J	4.056	Q 24hr	4.032	Q 24hr	-0.024
K	4.370	Q 24hr	4.370	Q 24hr	0.000
L	4.219	Q 24hr	4.188	Q 24hr	-0.032
M	3.421	Q 24hr	3.432	Q 24hr	0.011
N	3.255	Q 24hr	3.263	Q 24hr	0.008
O	2.715	Q 24hr	2.725	Q 24hr	0.010
Cudgen Creek (upstream of site discharge)					
P	2.448	Q 36hr	2.446	Q 36hr	-0.001
Q	2.486	Q 36hr	2.485	Q 36hr	-0.001
R	2.496	Q 36hr	2.494	Q 36hr	-0.001
S	2.496	Q 36hr	2.495	Q 36hr	-0.001

Note: Flood level envelope includes (a) 20 year ARI catchment runoff with 10 year ARI storm surge boundary, denoted by 'Q duration', and (b) 20 year ARI storm surge boundary with 10 year ARI catchment runoff, denoted by 'duration H'.

Table A5.1.4 Peak flood levels and critical storm durations – 10 year ARI design event

Reporting Point ID	Existing Case		Developed Case		Impact (m)
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	
Cudgen Creek (downstream of site discharge)					
A	1.536	Q 6hr	1.535	Q 6hr	0.000
B	1.876	Q 36hr	1.874	Q 36hr	-0.002
C	2.157	Q 36hr	2.152	Q 36hr	-0.005
Kings Forest local catchment					
D	2.256	Q 36hr	2.237	Q 36hr	-0.020
E	2.259	Q 36hr	2.259	Q 36hr	0.000
F	2.261	Q 36hr	2.260	Q 36hr	0.000
G	2.263	Q 36hr	2.269	Q 36hr	0.006
H	2.269	Q 36hr	2.273	Q 36hr	0.004
I	2.426	Q 36hr	2.412	Q 36hr	-0.014
J	4.002	Q 24hr	3.976	Q 24hr	-0.026
K	4.355	Q 24hr	4.356	Q 24hr	0.001
L	4.145	Q 24hr	4.117	Q 24hr	-0.028
M	3.377	Q 24hr	3.386	Q 24hr	0.009
N	3.216	Q 24hr	3.223	Q 24hr	0.007
O	2.683	Q 24hr	2.688	Q 24hr	0.004
Cudgen Creek (upstream of site discharge)					
P	2.249	Q 36hr	2.247	Q 36hr	-0.001
Q	2.279	Q 36hr	2.278	Q 36hr	-0.001
R	2.287	Q 36hr	2.286	Q 36hr	-0.001
S	2.287	Q 36hr	2.286	Q 36hr	-0.001

Table A5.1.5 Peak flood levels and critical storm durations – 5 year ARI design event

Reporting Point ID	Existing Case		Developed Case		Impact (m)
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	
Cudgen Creek (downstream of site discharge)					
A	0.873	Q 24hr	0.873	Q 24hr	0.000
B	1.683	Q 36hr	1.678	Q 36hr	-0.005
C	2.018	Q 36hr	2.011	Q 36hr	-0.007
Kings Forest local catchment					
D	2.115	Q 36hr	2.085	Q 36hr	-0.031
E	2.118	Q 36hr	2.104	Q 36hr	-0.013
F	2.119	Q 36hr	2.106	Q 36hr	-0.014
G	2.121	Q 36hr	2.111	Q 36hr	-0.010
H	2.125	Q 36hr	2.114	Q 36hr	-0.012
I	2.318	Q 36hr	2.318	Q 24hr	-0.001
J	3.953	Q 24hr	3.930	Q 6hr	-0.022
K	4.349	Q 24hr	4.349	Q 24hr	0.000
L	4.087	Q 24hr	4.061	Q 24hr	-0.026
M	3.342	Q 24hr	3.351	Q 24hr	0.009
N	3.187	Q 24hr	3.192	Q 24hr	0.006
O	2.662	Q 24hr	2.666	Q 24hr	0.004
Cudgen Creek (upstream of site discharge)					
P	2.064	Q 36hr	2.062	Q 36hr	-0.002
Q	2.089	Q 36hr	2.087	Q 36hr	-0.002
R	2.096	Q 36hr	2.095	Q 36hr	-0.002
S	2.097	Q 36hr	2.095	Q 36hr	-0.002

13.2 Appendix 5.2 Predicted water surface levels during extreme flood events

Table A5.2.1 Flood levels and critical storm durations – 500 year ARI design event

Reporting Point ID	Existing Case		Developed Case		Impact (m)
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	
Cudgen Creek (downstream of site discharge)					
A	2.732	Q 36hr	2.733	Q 36hr	0.001
B	3.085	Q 36hr	3.085	Q 36hr	0.000
C	3.215	Q 36hr	3.214	Q 36hr	0.000
Kings Forest local catchment					
D	3.237	Q 36hr	3.231	Q 36hr	-0.006
E	3.238	Q 36hr	3.238	Q 36hr	-0.001
F	3.239	Q 36hr	3.238	Q 36hr	-0.001
G	3.240	Q 36hr	3.240	Q 36hr	0.000
H	3.241	Q 36hr	3.241	Q 36hr	0.000
I	3.245	Q 36hr	3.244	Q 36hr	-0.001
J	4.200	Q 6hr	4.117	Q 6hr	-0.082
K	4.458	Q 6hr	4.433	Q 6hr	-0.026
L	4.426	Q 6hr	4.346	Q 6hr	-0.081
M	3.519	Q 6hr	3.541	Q 6hr	0.023
N	3.346	Q 6hr	3.365	Q 6hr	0.018
O	3.240	Q 36hr	3.244	Q 36hr	0.003
Cudgen Creek (upstream of site discharge)					
P	3.297	Q 36hr	3.298	Q 36hr	0.001
Q	3.345	Q 36hr	3.346	Q 36hr	0.001
R	3.357	Q 36hr	3.358	Q 36hr	0.001
S	3.359	Q 36hr	3.359	Q 36hr	0.001

Table A5.2.2 Flood levels and critical storm durations – Probable Maximum Flood (PMF)

Reporting Point ID	Existing Case		Developed Case		Impact (m)
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	
Cudgen Creek (downstream of site discharge)					
A	5.304	Q 36hr	5.308	Q 36hr	0.005
B	5.420	Q 36hr	5.425	Q 36hr	0.005
C	5.617	Q 36hr	5.623	Q 36hr	0.006
Kings Forest local catchment					
D	5.636	Q 36hr	5.641	Q 36hr	0.006
E	5.641	Q 36hr	5.652	Q 36hr	0.011
F	5.642	Q 36hr	5.652	Q 36hr	0.011
G	5.643	Q 36hr	5.653	Q 36hr	0.010
H	5.643	Q 36hr	5.653	Q 36hr	0.011
I	5.643	Q 36hr	5.654	Q 36hr	0.011
J	5.643	Q 36hr	5.654	Q 36hr	0.011
K	5.644	Q 36hr	5.654	Q 36hr	0.010
L	5.644	Q 36hr	5.654	Q 36hr	0.010
M	5.643	Q 36hr	5.653	Q 36hr	0.010
N	5.643	Q 36hr	5.653	Q 36hr	0.011
O	5.643	Q 36hr	5.653	Q 36hr	0.011
Cudgen Creek (upstream of site discharge)					
P	5.658	Q 36hr	5.661	Q 36hr	0.002
Q	5.702	Q 36hr	5.698	Q 36hr	-0.004
R	5.715	Q 36hr	5.712	Q 36hr	-0.004
S	5.720	Q 36hr	5.716	Q 36hr	-0.004

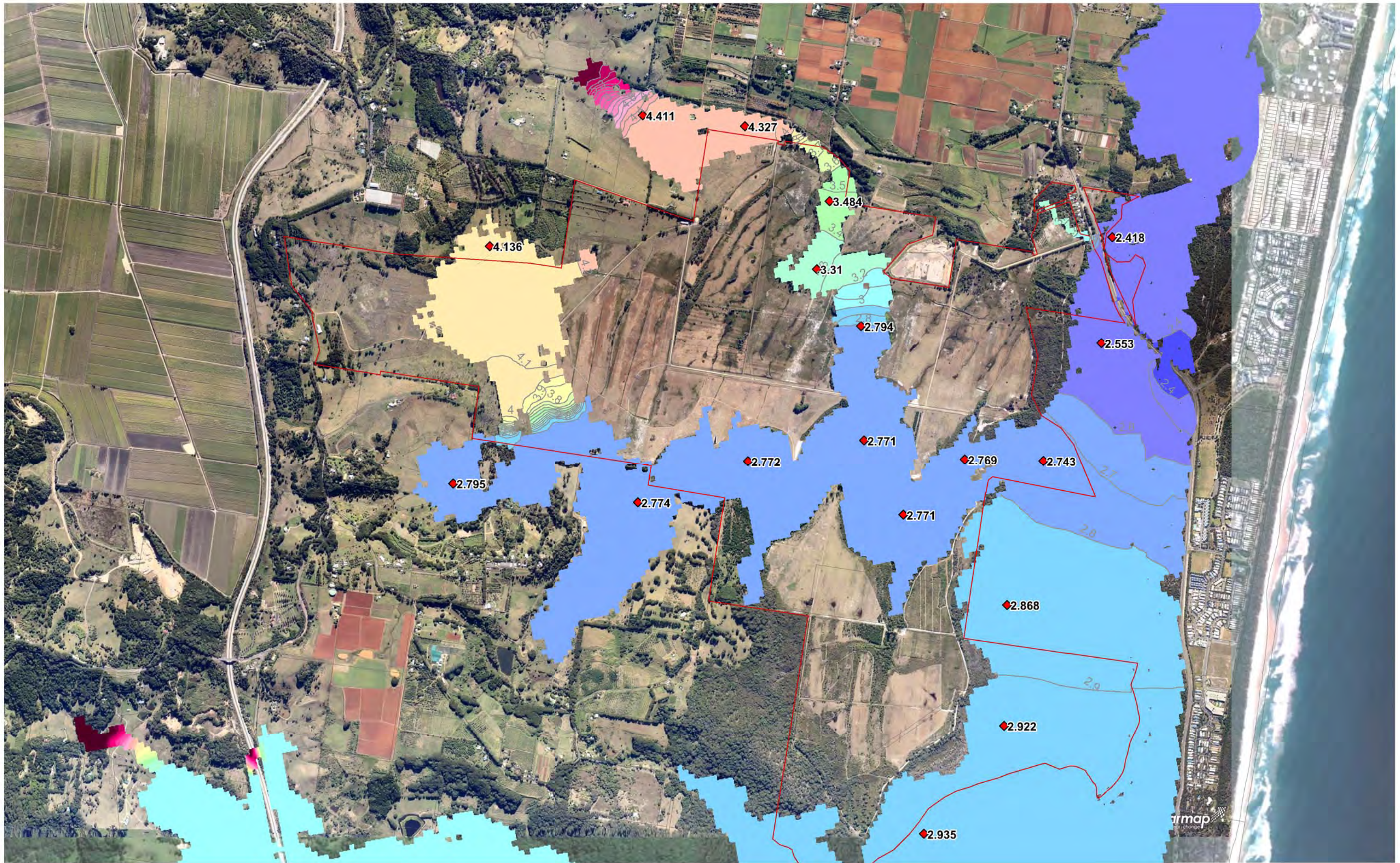
13.3 Appendix 5.3 Predicted water surface levels under future Climate Change conditions

Table A5.3.1 Flood levels and critical storm durations – 100 year ARI Climate Change Scenario

Reporting Point ID	Existing Case		Developed Case		Impact (m)
	Flood level (mAHD)	Storm duration	Flood level (mAHD)	Storm duration	
Cudgen Creek (downstream of site discharge)					
A	2.797	24hr H	2.797	24hr H	0.000
B	2.796	Q 36hr	2.799	Q 36hr	0.003
C	2.956	Q 36hr	2.959	Q 36hr	0.003
Kings Forest local catchment					
D	2.979	Q 36hr	2.978	Q 36hr	-0.001
E	2.980	Q 36hr	2.984	Q 36hr	0.004
F	2.980	Q 36hr	2.985	Q 36hr	0.004
G	2.981	Q 36hr	2.987	Q 36hr	0.006
H	2.982	Q 36hr	2.987	Q 36hr	0.005
I	2.986	Q 36hr	2.990	Q 36hr	0.004
J	4.166	Q 6hr	4.129	Q 24hr	-0.037
K	4.442	Q 24hr	4.432	Q 24hr	-0.010
L	4.392	Q 24hr	4.335	Q 24hr	-0.057
M	3.499	Q 24hr	3.522	Q 24hr	0.022
N	3.328	Q 24hr	3.345	Q 24hr	0.018
O	2.984	Q 36hr	2.999	Q 36hr	0.016
Cudgen Creek (upstream of site discharge)					
P	3.069	Q 36hr	3.072	Q 36hr	0.003
Q	3.124	Q 36hr	3.127	Q 36hr	0.003
R	3.137	Q 36hr	3.140	Q 36hr	0.003
S	3.138	Q 36hr	3.141	Q 36hr	0.003

Note: Flood level envelope includes (a) 100 year ARI climate change catchment runoff with 10 year ARI storm surge boundary including sea level rise, denoted by 'Q duration', and (b) 100 year ARI storm surge boundary including sea level rise with 10 year ARI climate catchment runoff, denoted by 'duration H'.

14 Appendix 6 – Flood maps



ORIENTATION
 NORTH
SCALE
 200 400 600 800 1000 metres
ROBINA
 PO Box 4115 Robina QLD4230
 Email robina@access.gs 07 5578 9944
 www.access.gs

LEGEND

— Site boundary	Water surface level (mAHd)	3.0 to 3.2	4.2 to 4.4	5.4 to 5.6
◆ Peak flood level at reporting point (mAHd)	< 2.0	3.2 to 3.4	4.4 to 4.6	5.6 to 5.8
— Peak flood level contours (mAHd)	2.0 to 2.2	3.4 to 3.6	4.6 to 4.8	5.8 to 6.0
	2.2 to 2.4	3.6 to 3.8	4.8 to 5.0	> 6.0
	2.4 to 2.6	3.8 to 4.0	5.0 to 5.2	
	2.6 to 2.8	4.0 to 4.2	5.2 to 5.4	
	2.8 to 3.0			

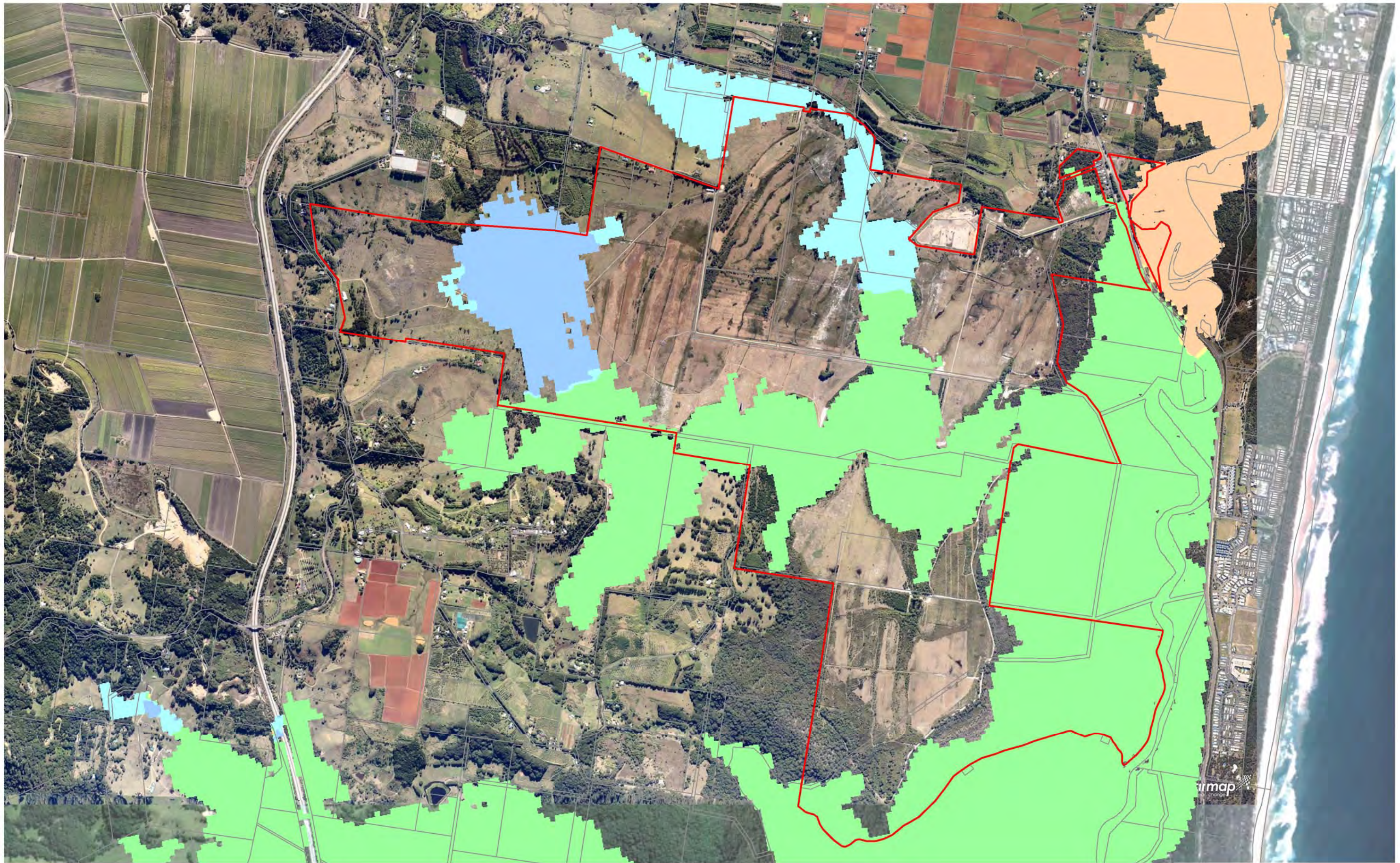
SOURCES
 Image sources:
 Nearmap (Image date: 14 June 2012)
 Google Earth (Image date: 13 May 2010)



PROJECT
 KINGS FOREST REGIONAL FLOOD MAPS
SCALE
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CLIENT
 PROJECT 28 PTY LTD
DATE
 29/08/12
DRAWN
 AJF
CHECKED
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DRAWING
 100 YEAR ARI EXISTING CASE FLOOD LEVELS
PROJECT NO
 10927
DRAWING NO
 MAP-01

Brisbane Sydney Melbourne and regions
GILBERT SUTHERLAND
 Agriculture. Water. Environment.




ORIENTATION
 NORTH
SCALE

ROBINA
 PO Box 4115 Robina QLD4230 07 5578 9944
 Email robina@access.gs www.access.gs

LEGEND
 Site boundary
 Critical storm event
 100 year ARI 6hr runoff event (20 year ARI storm surge)
 100 year ARI 24hr runoff event (20 year ARI storm surge)
 100 year ARI 36hr runoff event (20 year ARI storm surge)
 100 year ARI storm surge (10 year ARI 6hr runoff event)
 100 year ARI storm surge (10 year ARI 24hr runoff event)
 100 year ARI storm surge (10 year ARI 36hr runoff event)

SOURCES
 Image sources:
 Nearmap (Image date: 14 June 2012)
 Google Earth (Image date: 13 May 2010)

PROJECT
 KINGS FOREST
 REGIONAL
 FLOOD MAPS
SCALE
 1:20 000@A3

CLIENT
 PROJECT 28
 PTY LTD
DATE
 27/08/12
DRAWN
 AJF
CHECKED
 NTZ

DRAWING
 100 YEAR ARI
 EXISTING CASE
 CRITICAL STORM
 ANALYSIS
PROJECT NO
 10927
DRAWING NO
 MAP-02

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 Agriculture. Water. Environment.