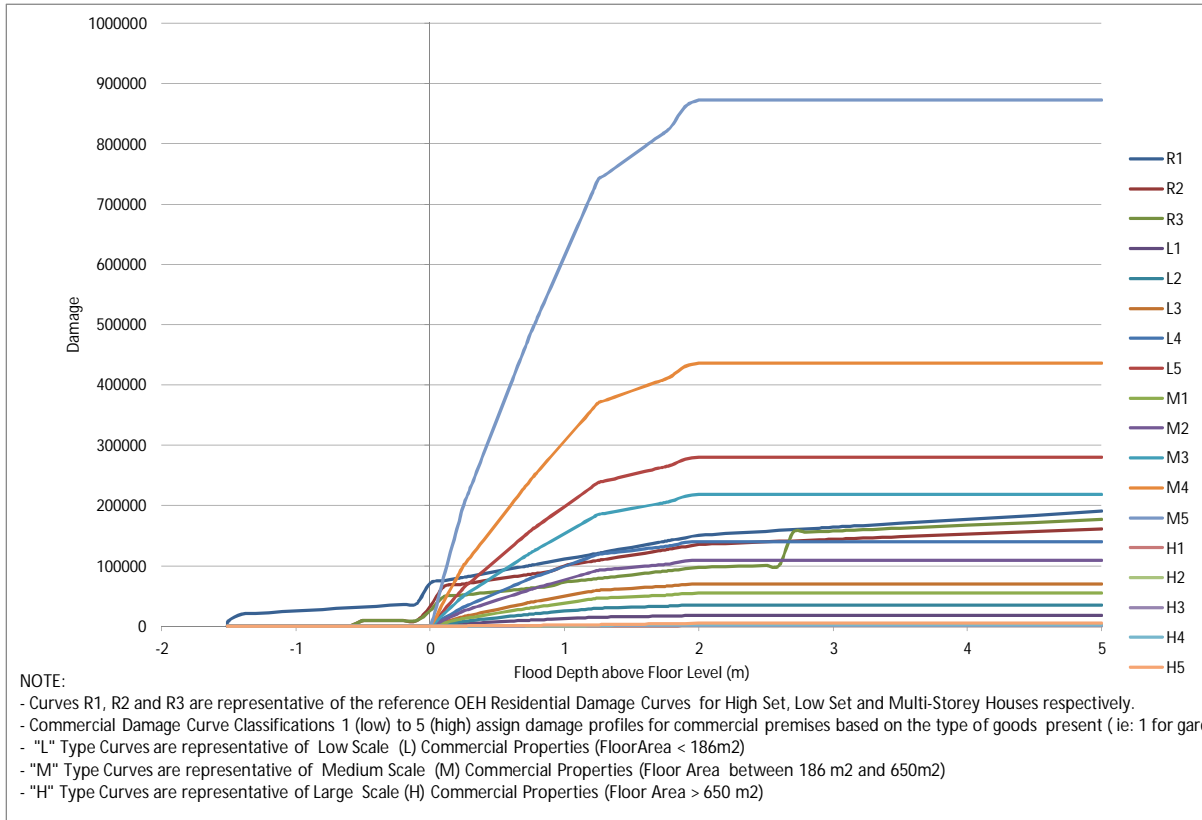


# **Appendix D** Flood Damage Information and Mapping

# Boambee Newports Creek FRMS&P

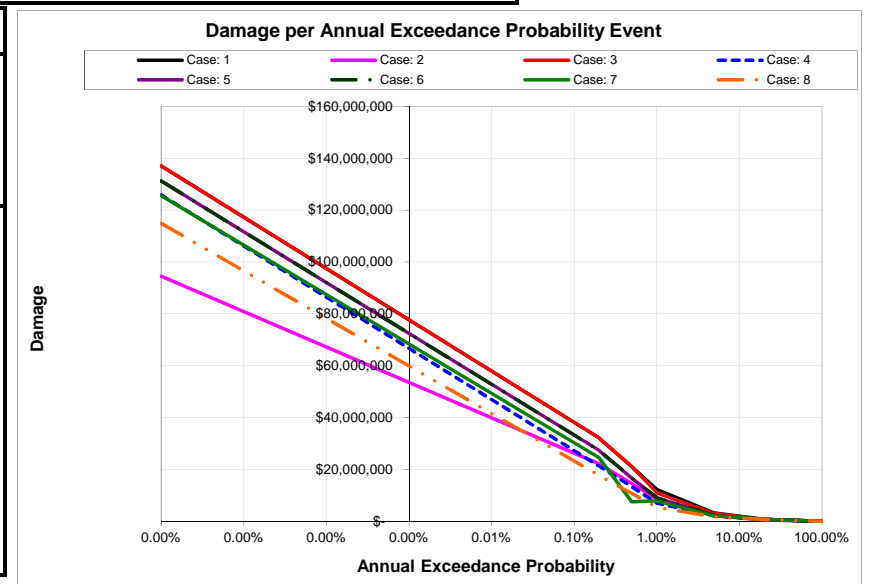
GHD Project: 22/16407



n:\AU\Coffs Harbour\Projects\22\16407\Technical\Flood Damages\Chart of Damage Curves.xlsx

**Annual Average Damage Calculation (AAD) for a Range of Cases - Based upon Total Damages for a Range of Events**

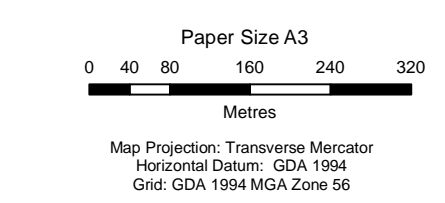
<b>Project:</b> Boambee Newports Creek Flood Damage Assessment							
<b>Job No:</b> 22-16407		<b>Design Life of Options (Years) - 50 years max for structural options</b>	<b>AAD</b>	<b>NPV of Damage</b>	<b>Cost Of Option</b>	<b>Option Benefit Relative to Case 1</b>	<b>Benefit/Cost Relative to Case 1</b>
<b>Discount Factors Used</b> 4% 7% 10%							
Use 4,7 and 11% unless otherwise justified. All calculations based upon Middle Figure							
<b>Case</b>	<b>Description</b>						
1	Additional 45% indirect, social, infrastructure damages	20	\$ 1,234,288	\$ 14,310,358	n/a	n/a	n/a
2	Direct damages associated with residential and commercial properties	20	\$ 851,233	\$ 9,869,213	\$ -	\$ 4,441,146	n/a
3	Barcoo Court Levee (1% AEP - No Freeboard) (Damages within proposed levee assumed to be zero for 1%, 5% and 20% AEP Flood events) concrete wall levee	20	\$ 1,180,490	\$ 13,686,622	\$ 638,720	\$ 623,737	0.98
4	North Boambee Valley Basin Works - OPTN4 - flood detention basin in upper North Boambee Valley - 63% of Costs to Flood Mitigation	20	\$ 932,478	\$ 10,811,166	\$ 2,992,500	\$ 3,499,192	1.17
5	Maintained Flood Bypass Channel through Isles Drive Subdivision and Additional Culverts under highway (assume Pipe Jacking of 8 x 1.2m Dia RCP)	20	\$ 1,006,239	\$ 11,666,344	\$ 1,172,001	\$ 2,644,014	2.26
6	Maintained Flood Bypass Channel through Isles Drive Subdivision and Removal of Pacific Highway Median at overflow Location (assumes damages as per 5)	20	\$ 1,006,239	\$ 11,666,344	\$ 433,221	\$ 2,644,014	6.10
7	PC 24	19	\$ 913,658	\$ 10,356,861	\$ 931,788	\$ 3,953,497	4.24
8	PC25, 63% of basin costs to flood mitigation	19	\$ 813,760	\$ 9,224,459	\$ 3,924,288	\$ 5,085,900	1.30



AAD Calculation for Various Cases																
AEP	Case: 1		Case: 2		Case: 3		Case: 4		Case: 5		Case: 6		Case: 7		Case: 8	
	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD	AEP Event Damage	Contribution to AAD
0.000%	\$ 137,103,513	\$ 169,272	\$ 94,554,147	\$ 116,740	\$ 137,103,513.15	\$ 169,272	\$ 125,908,898.35	\$ 147,202	\$ 131,303,889	\$ 158,746	\$ 131,303,889	\$ 158,746	\$ 125,625,277	\$ 150,150	\$ 114,913,857	\$ 132,669
0.20%	\$ 32,168,256	\$ 79,880	\$ 22,185,004	\$ 55,090	\$ 32,168,255.80	\$ 79,880	\$ 21,292,755.55	\$ 51,909	\$ 27,442,023	\$ 66,160	\$ 27,442,023	\$ 66,160	\$ 24,525,027	\$ 48,087	\$ 17,755,376	\$ 42,743
0.50%	\$ 21,085,279	\$ 83,630	\$ 14,541,572	\$ 57,676	\$ 21,085,279.40	\$ 80,063	\$ 13,313,302.60	\$ 50,713	\$ 16,664,956	\$ 64,395	\$ 16,664,956	\$ 64,395	\$ 7,532,873	\$ 38,420	\$ 10,739,908	\$ 40,550
1.0%	\$ 12,366,544	\$ 311,900	\$ 8,528,651	\$ 215,103	\$ 10,939,807.75	\$ 278,798	\$ 6,972,007.45	\$ 181,819	\$ 9,092,988	\$ 227,099	\$ 9,092,988	\$ 227,099	\$ 7,835,219	\$ 197,902	\$ 5,480,002	\$ 144,058
5.0%	\$ 3,228,454	\$ 296,998	\$ 2,226,520	\$ 204,826	\$ 3,000,068.85	\$ 279,869	\$ 2,118,963.30	\$ 212,908	\$ 2,261,981	\$ 220,205	\$ 2,261,981	\$ 220,205	\$ 2,059,874	\$ 205,745	\$ 1,722,905	\$ 180,458
20.0%	\$ 731,521	\$ 292,608	\$ 504,497	\$ 201,799	\$ 731,520.65	\$ 292,608	\$ 719,814.80	\$ 287,926	\$ 674,082	\$ 269,633	\$ 674,082	\$ 269,633	\$ 683,388	\$ 273,355	\$ 683,207	\$ 273,283
100.0%	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL AAD	\$ 1,234,288	TOTAL AAD	\$ 851,233	TOTAL AAD	\$ 1,180,490	TOTAL AAD	\$ 932,478	TOTAL AAD	\$ 1,006,239	TOTAL AAD	\$ 1,006,239	TOTAL AAD	\$ 913,658	TOTAL AAD	\$ 813,760	

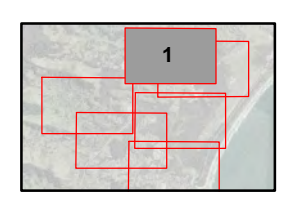
Summary of NPV of Damages for Options								
Discount Factor	Case							
	1	2	3	4	5	6	7	8
Applicable Timeframe For Option yrs (Max 50)	20	20	20	20	20	20	19	19
4%	\$ 18,008,672	\$ 12,419,774	\$ 17,223,739	\$ 13,605,162	\$ 14,681,349	\$ 14,681,349	\$ 12,913,591	\$ 11,501,640
7%	\$ 14,310,358	\$ 9,869,213	\$ 13,686,622	\$ 10,811,166	\$ 11,666,344	\$ 11,666,344	\$ 10,356,861	\$ 9,224,459
10%	\$ 11,742,482	\$ 8,098,263	\$ 11,230,670	\$ 8,871,191	\$ 9,572,915	\$ 9,572,915	\$ 8,556,337	\$ 7,620,801





**LEGEND**

- Flood Damages (NPV - '\$000's)
- 1% AEP Flood Extents



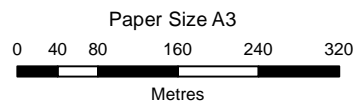
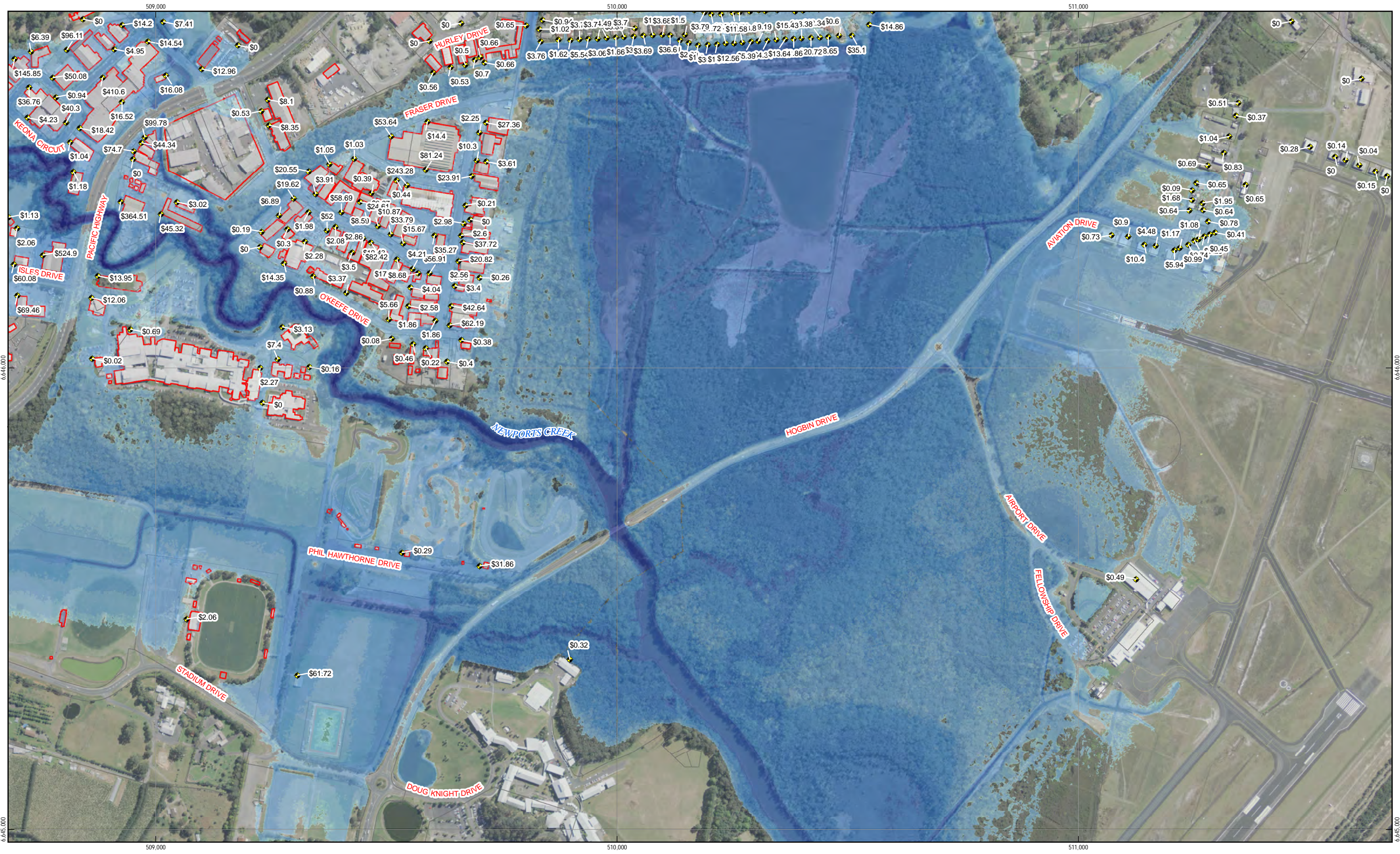
Coffs Harbour City Council  
Boambee newports Creek  
Floodplain Risk Management Study

Job Number	22-16407
Revision	0
Date	14 Jul 2016

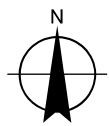
**Flood Damages  
NPV (\$000's)**

**Appendix D.1**



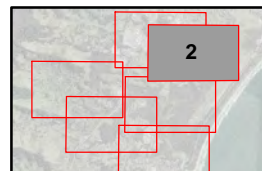


Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



LEGEND

- Flood Damages (NPV - '\$000's)
- 1% AEP Flood Extents



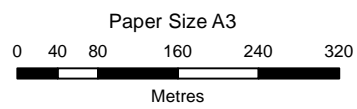
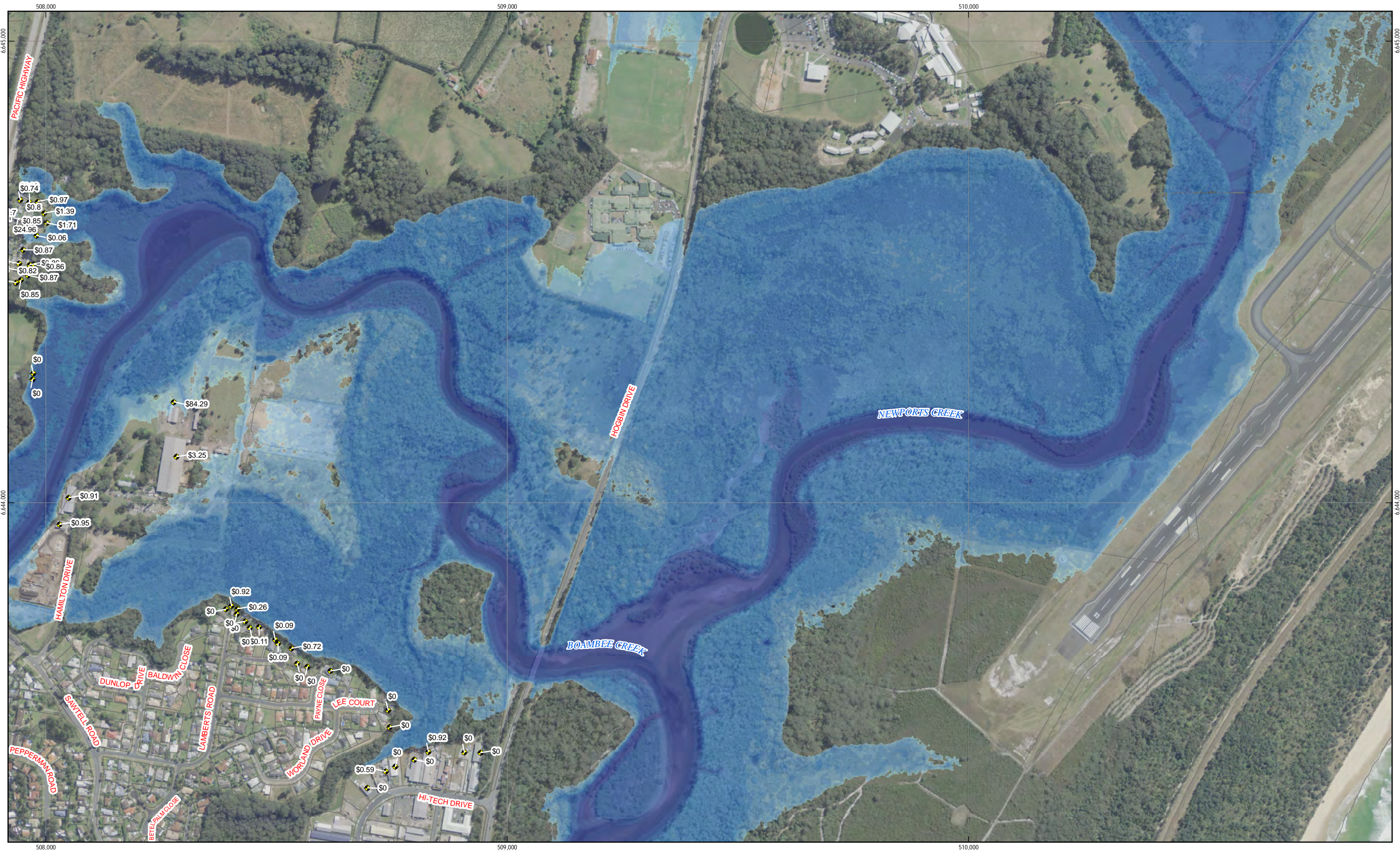
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Floodplain Risk Management Study

Job Number	22-16407
Revision	0
Date	14 Jul 2016

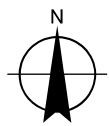
**Flood Damages  
NPV (\$000's)**

**Appendix D.2**



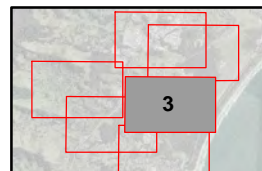


Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



LEGEND

- Flood Damages (NPV - '\$000's)
- 1% AEP Flood Extents



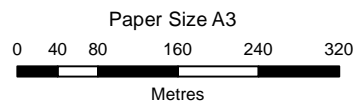
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Revision | 0  
Date | 14 Jul 2016

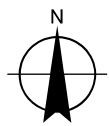
Flood Damages  
NPV (\$000's)

Appendix D.3



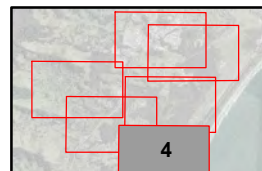


Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



LEGEND

- Flood Damages (NPV - '\$000's)
- 1% AEP Flood Extents



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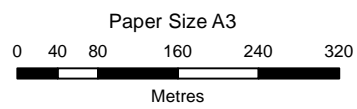
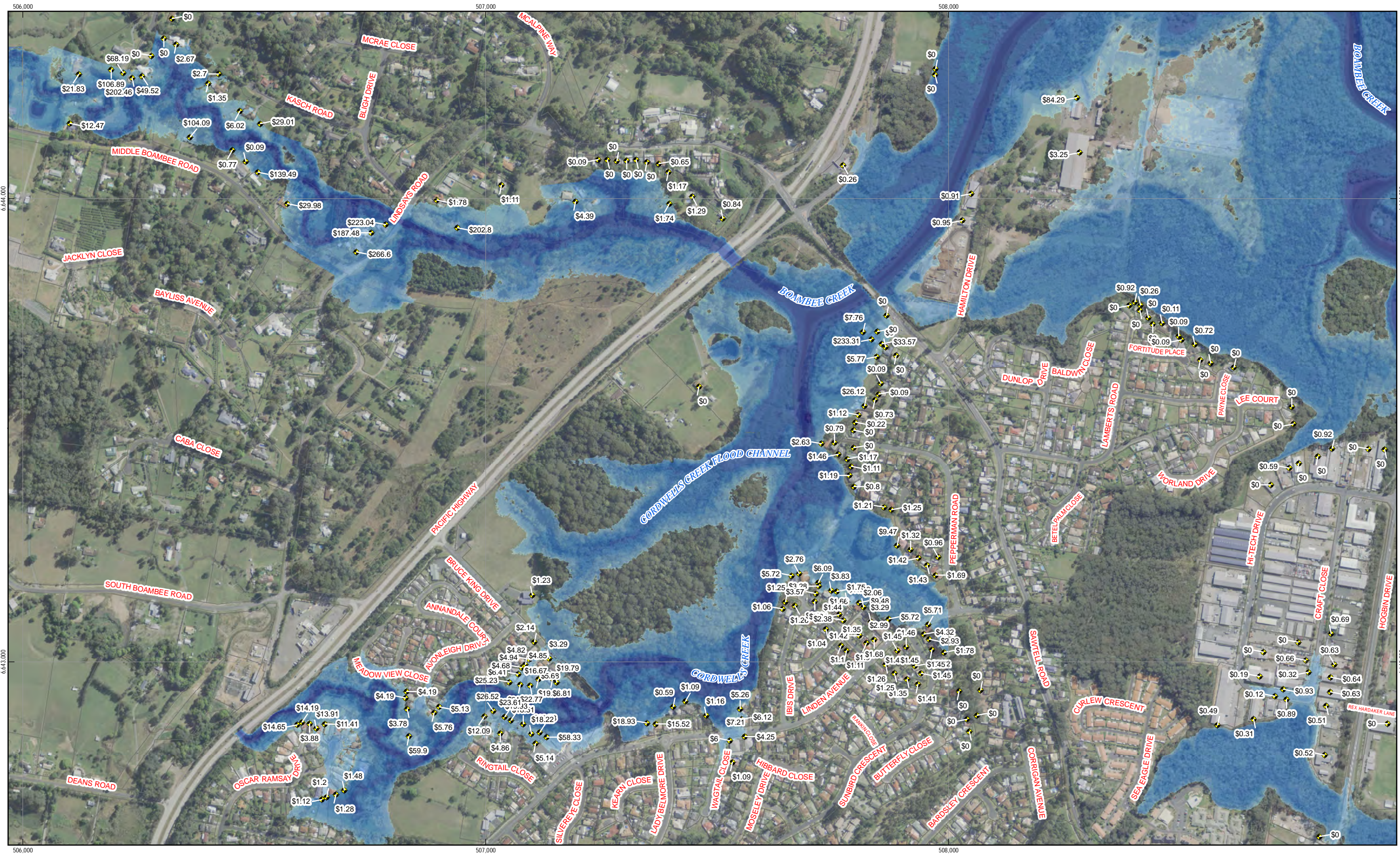
Flood Damages  
NPV (\$000's)

Appendix D.4

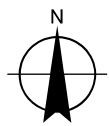
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Data source: LPI (2012), LPI Lot Boundaries, 2012. Created by:sldougias



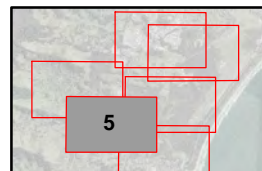


Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



LEGEND

- Flood Damages (NPV - '\$000's)
- 1% AEP Flood Extents



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Date | 14 Jul 2016

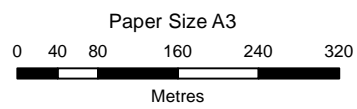
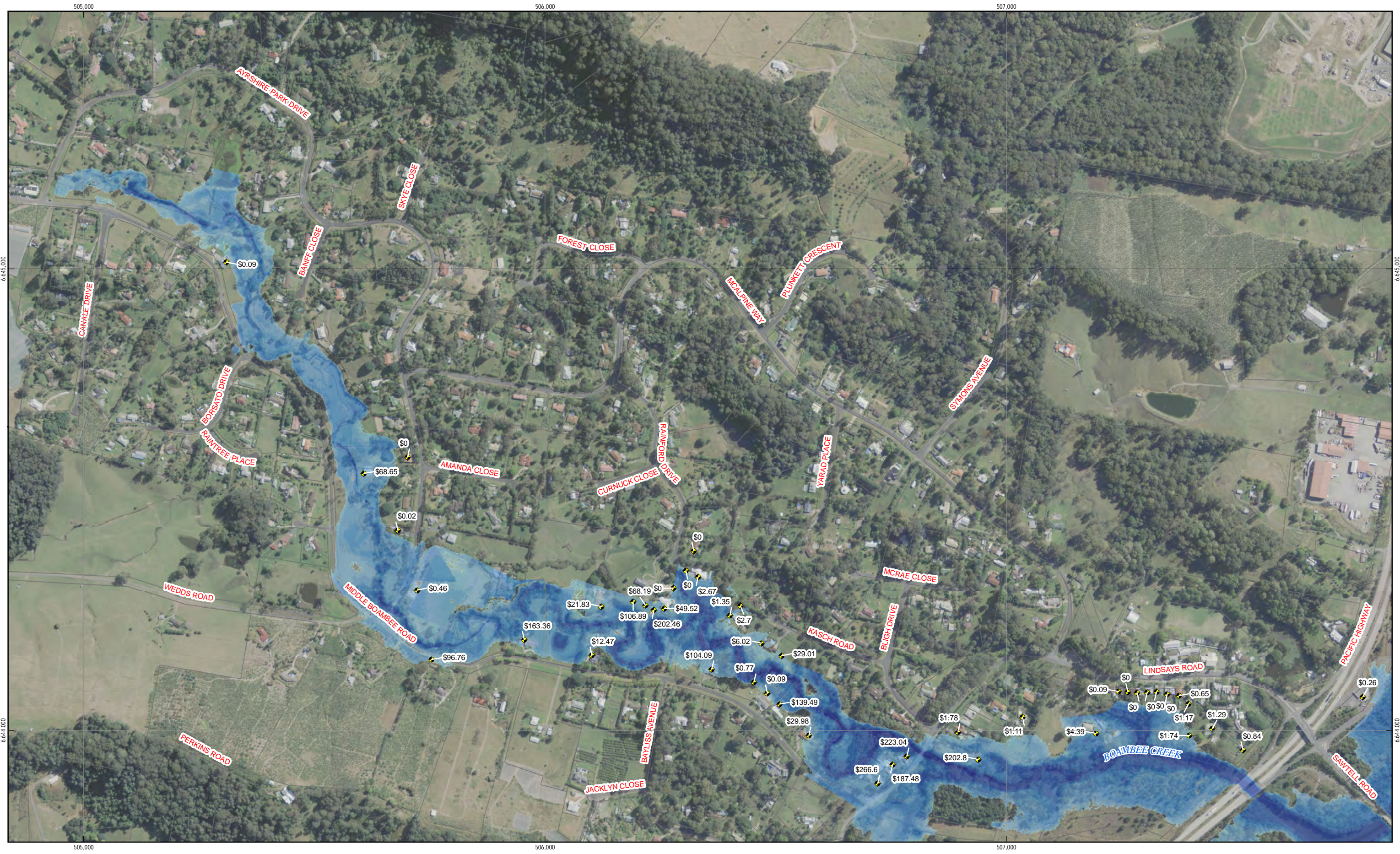
Flood Damages  
NPV (\$000's)

Appendix D.5

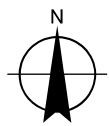
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Data source: LPI (2012), LPI Lot Boundaries, 2012. Created by:sliduglas



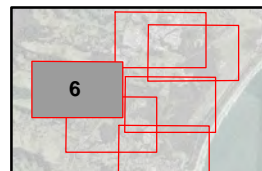


Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 56



LEGEND

- Flood Damages (NPV - \$'000's)
- 1% AEP Flood Extents



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Flood Damages  
 NPV (\$'000's)

Appendix D.6

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 Data source: LPI (2012), LPI Lot Boundaries, 2012. Created by:sldouglas