



MINUTES

ORDINARY MEETING OF COUNCIL

20 FEBRUARY 2018



<p style="text-align: center;">TABLE OF CONTENTS FOR ORDINARY MEETING OF COUNCIL HELD ON 20 FEBRUARY 2018</p>
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	PAGE
1. <u>DECLARATION OF OPENING</u>	3
2. <u>RECORD OF ATTENDANCE, APOLOGIES AND LEAVE OF ABSENCE</u>	3
2.1 ATTENDANCE	3
2.2 APOLOGIES	3
2.3 LEAVE OF ABSENCE	4
3. <u>DISCLOSURES OF INTEREST</u>	4
4. <u>PUBLIC QUESTION TIME</u>	4
4.1 RESPONSES TO PUBLIC QUESTIONS PREVIOUSLY TAKEN ON NOTICE	4
4.2 PUBLIC QUESTIONS	4
5. <u>PETITIONS, DEPUTATIONS AND PRESENTATIONS</u>	4
5.1 PETITIONS	4
5.2 DEPUTATIONS	4
5.3 PRESENTATIONS	4
6. <u>APPLICATIONS FOR LEAVE OF ABSENCE</u>	4
7. <u>CONFIRMATION OF MINUTES</u>	5
8. <u>ANNOUNCEMENTS BY THE PRESIDING MEMBER</u>	5
9. <u>UNRESOLVED BUSINESS FROM PREVIOUS MEETINGS</u>	5
10. <u>QUESTIONS BY MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN</u>	5
11. REPORTS	6
11.1. <u>OFFICE OF THE CEO</u>	6
11.2. <u>CORPORATE AND COMMUNITY SERVICES</u>	6
11.2.1 MONTHLY FINANCIAL STATEMENT FOR THE PERIOD ENDING 31 JANUARY 2018	6
11.3. <u>PLANNING AND DEVELOPMENT</u>	38
11.3.1 INITIATE FOR PUBLIC CONSULTATION THE SHIRE OF GINGGIN'S DRAFT COASTAL HAZARD RISK MANAGEMENT AND ADAPTATION PLAN (CHRMAP)	38
11.3.2 APPLICATION FOR DEVELOPMENT APPROVAL - PROPOSED OVERSIZE OUTBUILDING ON LOT 277 (2) O'NEIL STREET, LANCELIN	205
11.3.3 APPLICATION FOR DEVELOPMENT APPROVAL - PROPOSED OVER HEIGHT OUTBUILDING ON LOT 17 (5) PYP COURT, LANCELIN	216
11.3.4 APPLICATION FOR DEVELOPMENT APPROVAL - PROPOSED TELECOMMUNICATIONS INFRASTRUCTURE (MOBILE BASE STATION) ON LOT 9916 EDWARDS STREET, SEABIRD	227

11.4.	<u>OPERATIONS-CONSTRUCTION</u>	323
11.5.	<u>ASSETS</u>	323
12.	<u>MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN</u>	323
13.	<u>COUNCILLORS' OFFICIAL REPORTS</u>	323
13.1	GINGIN DISTRICT HIGHSCHOOL	323
13.2	LOWER COAST WEIGHT WATCHERS GROUP – SOVEREIGN HILL	323
13.3	LOWER COASTAL NEIGHBOURHOOD WATCH – OCEAN FARM	323
13.4	WHEATBELT NORTH REGIONAL ROAD GROUP – 19 FEBRUARY 2018	324
14.	<u>NEW BUSINESS OF AN URGENT NATURE</u>	324
15.	<u>MATTERS FOR WHICH MEETING IS TO BE CLOSED TO THE PUBLIC</u>	324
15.1	ACQUISITION OF LOT 361 (36) BROCKMAN STREET, GINGIN	325
16.	<u>CLOSURE</u>	326

SHIRE OF GINGIN

MINUTES OF THE ORDINARY MEETING OF THE SHIRE OF GINGIN HELD IN THE COUNCIL CHAMBER ON TUESDAY, 20 FEBRUARY 2018 AT 3.00 PM

DISCLAIMER

Members of the Public are advised that decisions arising from this Council Meeting can be subject to alteration.

Applicants and other interested parties should refrain from taking any action until such time as written advice is received confirming Council's decision with respect to any particular issue.

ORDER OF BUSINESS

1. DECLARATION OF OPENING

In the absence of the Shire President at the commencement of the meeting, the Deputy Shire President declared the meeting open at 3.05 pm.

2. RECORD OF ATTENDANCE, APOLOGIES AND LEAVE OF ABSENCE

2.1 ATTENDANCE

Councillors – I B Collard (Shire President) attended at 3:10 pm, J W Elgin (Deputy Shire President), C W Fewster, J Court, F J Peczka, K Rule, F Johnson and J Morton.

Staff – J Edwards (Chief Executive Officer), K Lowes (Executive Manager Corporate and Community Services, A Butcher (Executive Manager Operations – Construction), L Edwards (Executive Manager Planning and Development) from 3:20 pm, R Rasool (Executive Manager Assets) and K Okely (Minute Officer).

Gallery - There were two members of the public in the Gallery.

2.2 APOLOGIES

Councillor J Lobb

2.3 LEAVE OF ABSENCE

Nil

3. DISCLOSURES OF INTEREST

Nil

4. PUBLIC QUESTION TIME

4.1 RESPONSES TO PUBLIC QUESTIONS PREVIOUSLY TAKEN ON NOTICE

Nil

4.2 PUBLIC QUESTIONS

Nil

5. PETITIONS, DEPUTATIONS AND PRESENTATIONS

5.1 PETITIONS

Nil

5.2 DEPUTATIONS

Nil

5.3 PRESENTATIONS

Nil

6. APPLICATIONS FOR LEAVE OF ABSENCE

Applications for Leave of Absence were received from Councillor Morton for the period 16 March 2018 to 24 March 2018 and Councillor Fewster for the period 12 March to 22 March 2018.

RESOLUTION

Moved Councillor Court, seconded Councillor Elgin that Council approve Councillor Morton's Application for Leave of Absence for the period ~~12~~ **16** March to ~~22~~ **24** March 2018 and Councillor Fewster's Application for Leave of Absence for the period 12 March to 22 March 2018.

Item 7 –
20 March
2018

CARRIED UNANIMOUSLY

7. CONFIRMATION OF MINUTES

RECOMMENDATION

It is recommended that the Minutes of the Ordinary Meeting of Council held on 16 January 2018 be confirmed.

RESOLUTION

Moved Councillor Johnson, seconded Councillor Court that the Minutes of the Ordinary Meeting of Council held on 16 January 2018 be confirmed.

CARRIED UNANIMOUSLY

8. ANNOUNCEMENTS BY THE PRESIDING MEMBER

Nil

9. UNRESOLVED BUSINESS FROM PREVIOUS MEETINGS

Nil

10. QUESTIONS BY MEMBERS OF WHICH DUE NOTICE HAS BEEN GIVEN

Nil

11. REPORTS

11.1. OFFICE OF THE CEO

Nil

11.2. CORPORATE AND COMMUNITY SERVICES

11.2.1 MONTHLY FINANCIAL STATEMENT FOR THE PERIOD ENDING 31 JANUARY 2018

FILE:	FIN/25
REPORTING OFFICER:	KAYE LOWES– EXECUTIVE MANAGER CORPORATE AND COMMUNITY SERVICES
REPORT DATE:	20 FEBRUARY 2018
REFER:	NIL

OFFICER INTEREST DECLARATION

Nil

COMMENT

The Monthly Financial Statement for the period ending 31 January 2018 is attached and includes the following:

1. Statement of Financial Position for the period to 31 January 2018 **(Appendix 1)**.
2. List of Paid Accounts for the period to 31 January 2018 **(Appendix 2)**.

STATUTORY ENVIRONMENT

Local Government Act 1995

Part 6 – Financial management

Division 3 – Reporting on activities and finance

Section 6.4 – Financial report

Local Government (Financial Management) Regulations 1996

Part 4 – Financial reports – s.6.4

Regulation 34 – Financial activity statement required each month (Act s.6.4)

POLICY IMPLICATIONS

Nil

BUDGET IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Shire of Gingin Strategic Community Plan 2017-2027

Focus Area	<i>Governance</i>
Objective	<i>5. To demonstrate effective leadership, governance and advocacy on behalf of community</i>
Outcome	<i>5.1 Values Our Organisational/business values are demonstrated in all that we do.</i>
Key Service Area	<i>Financial Management</i>
Priorities	<i>Nil</i>

VOTING REQUIREMENTS – SIMPLE MAJORITY

RECOMMENDATION

It is recommended that Council receive:

1. The Monthly Financial Statement for the period ending 31 January 2018 as presented in Appendix 1; and
2. The List of Paid Accounts for the period ending 31 January 2018 as presented in Appendix 2.

RESOLUTION

Moved Councillor Peczka, seconded Councillor Johnson that Council receive:

1. **The Monthly Financial Statement for the period ending 31 January 2018 as presented in Appendix 1; and**
2. **The List of Paid Accounts for the period ending 31 January 2018 as presented in Appendix 2.**

CARRIED UNANIMOUSLY

Councillor Collard entered the meeting and assumed the chair at 3:10pm.

APPENDIX 1



SHIRE OF GINGIN
MONTHLY STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

TABLE OF CONTENTS

	Page
1 Financial Reporting Summary	1-8
Notes to and Forming Part of the Statement	
2 Statement of Financial Activity	9
3 Acquisition of Assets	10
4 Disposal of Assets	11
5 Information on Borrowings	12-13
6 Reserves	14-17
7 Net Current Assets	18
8 Rating Information	19
9 Trust Funds	20
10 Operating Statement	21
11 Statement of Financial Position	22



Summary of Financial Position up to 31 January 2018

Operating Statement

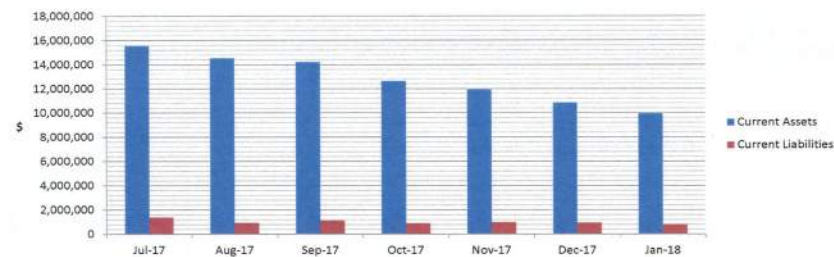
	Jan-18			Annual Budget	Annual Budget %
	Actual	YTD Budget	Variance		
Revenue	12,153,887	11,359,262	7%	13,926,873	87%
Expenses	(7,368,263)	(9,285,777)	-21%	(15,918,474)	46%
Profit/Loss	(77,945)	0	0%	0	0%
Non-Operating Grants	417,332	1,218,909	-66%	2,089,559	20%
Net Result	5,125,011	3,292,395		97,958	

Revenue: R to R and RRG Road Grants to be claimed in February

Assets & Liabilities

	Dec-17	Jan-18
Current		
Assets	10,861,064	9,963,744
Liabilities	988,754	842,841
Non-Current		
Assets	156,744,589	155,887,749
Liabilities	2,664,677	2,664,677
Net Assets	163,962,223	162,343,975

CURRENT ASSETS & LIABILITIES



Capital Payments

	Year to 31 January 2018			Annual Budget
	YTD Actual	YTD Budget	Variance	
Land & Buildings	244,042	681,333	-64%	1,168,000
Infrastructure Roads	1,127,698	2,190,698	-49%	3,755,483
Infrastructure Parks	774,680	499,867	55%	856,915
Infrastructure Other	44,770	755,133	-94%	1,294,513
Infrastructure Footpaths	-	25,921	-100%	44,436
Plant & Equipment	208,778	1,002,307	-79%	1,718,241
Furniture and Equipment	48,331	54,084	-11%	92,716
Loans Current	124,131	109,540	13%	187,783
Transfer to Reserve	220,047	94,067	134%	161,257
Provisions	-	-	0%	-
Net Result	2,792,476	5,412,951	-48%	9,279,344

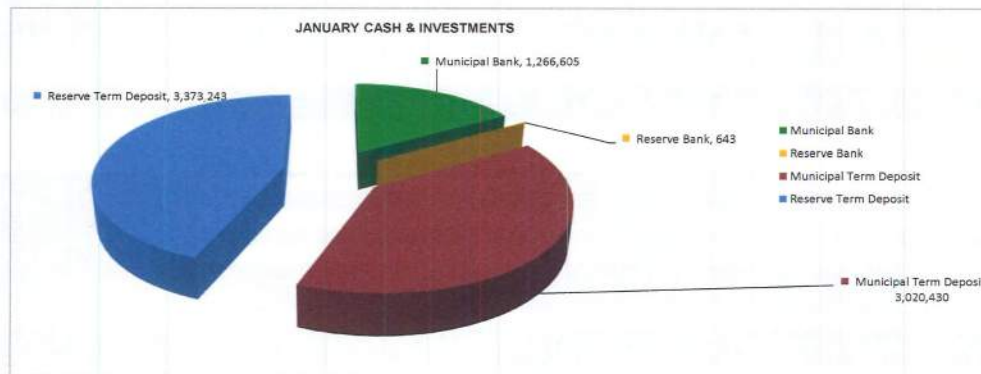
Refer to Capital Works Program.

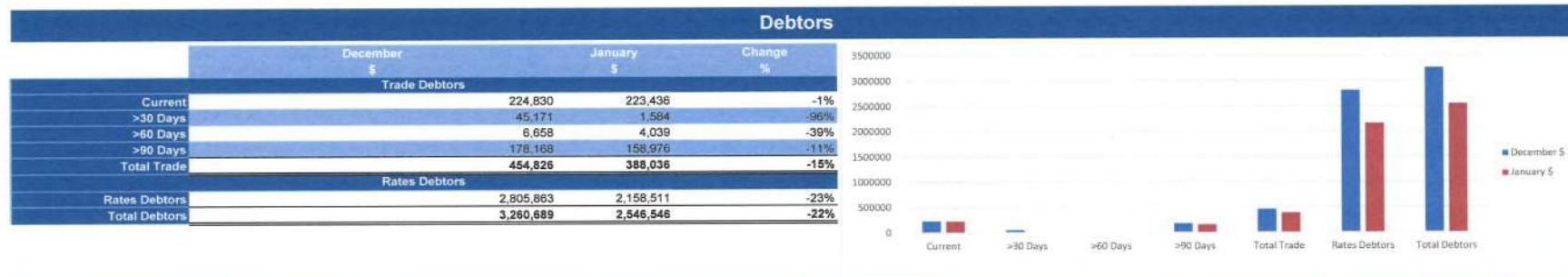
Note provisions are budgeted throughout operating accounts.

Cash & Investments

	Volume Held	
	Dec-17	Jan-18
Municipal Bank	1,380,324	1,266,605
Reserve Bank	643	643
Municipal Term Deposit	3,015,375	3,020,430
Reserve Term Deposit	3,354,426	3,373,243
Total	7,750,768	7,660,922

There was no RBA meeting in January. The cash rate remained the same at 1.5 per cent.

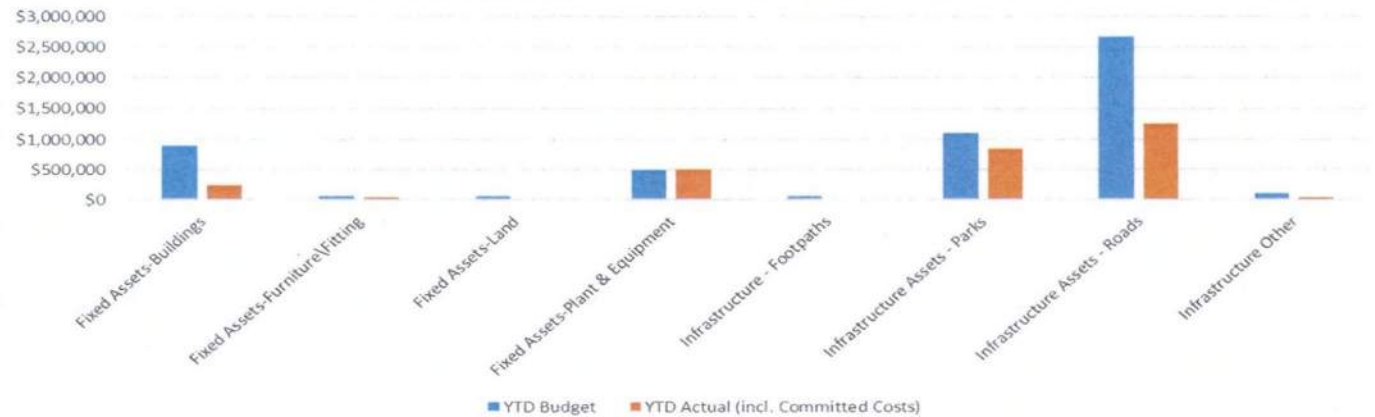




Budget Variances						
Account	Description	Total Budget	YTD Budget	YTD Actual	% of YTD Budget	Explanation
3010070	Plus Non Pay Penalty Interest	(\$98,000)	(\$57,162)	(\$67,193)	118%	Higher than anticipated Penalty Interest
5107045	Personal Protective Clothing/Equipment	\$32,000	\$18,662	\$7,378	40%	To be assessed in last quarter
5359020	Ranger/Fly Utility Purchase GG074	\$21,200	\$12,369	\$0	0%	Refer to Capital Works Program
6203106	Seniors Units - Lancelin	\$57,090	\$33,271	\$21,438	64%	Timing of refurbishment works
6259050	Gingin Aged Units (Air-conditioning, kitchen refurbishments, floor co	\$40,800	\$23,793	\$7,150	30%	Refer to Capital Works Program
7159090	Loan 100 Gingin Medical Ctr Principal Payment	\$24,425	\$14,245	\$24,424	171%	Refer to Capital Works Program
7407055	Health Allocation Fly Control	(\$20,000)	(\$11,662)	\$0	0%	EOY allocation
10105165	Waste Management Plan	\$20,000	\$11,662	\$0	0%	further investigation required into scope of works needed
10107050	Lancelin Domestic Removals	\$60,000	\$35,000	\$45,838	131%	Introduction of Recycling
10507002	Coastal Hazard Risk Management Plan (expenditure)	\$20,500	\$11,956	\$30,000	251%	Grace Darling Park Sand renourishment
10507080	CAP - Sand Renourishment Grant Project	\$26,773	\$15,617	\$1,710	11%	Seabird Wall monitoring as required
10659065	8GG Purchase of Isuzu D-Max LS-U 4x4 Crew Cab	\$52,500	\$52,500	\$37,480	71%	Refer to Capital Works Program
11203201	Guilderton Foreshore	\$45,181	\$26,334	\$36,961	140%	includes access track from boardwalk to foreshore
11305140	Gingin Aquatic Centre Mice (pool)	\$64,170	\$37,352	\$59,322	159%	Includes Kiosk expenditure which is offset by income
11305814	Tree Inspections - Public Open Space (POS)	\$20,000	\$11,662	\$0	0%	Timing of works
11313035	GG Swimming Pool Admissions	(\$38,500)	(\$22,456)	(\$37,698)	166%	Seasonal Income
11313037	GG Swimming Pool Kiosk Income	\$0	\$0	(\$11,098)		Kiosk Income Aquatic Centre
12205145	Traffic Signs/Equipment	\$60,500	\$35,280	\$47,153	134%	Timing of works
12259353	Old North Road Drive/Walk Trail	\$22,935	\$13,377	\$266	2%	Refer to Capital Works Program
12318916	Sale Of Front End Loader (TCM) GG016	(\$67,500)	(\$67,500)	\$0	0%	Sale in February
12359916	TCM Front End Loader GG016	\$313,000	\$313,000	\$0	0%	Refer to Capital Works Program
13115020	Grant - Agri Precinct Site identification project	\$0	\$0	(\$25,000)		transfer from restricted cash
13259065	Caravan Park Chalets	\$64,990	\$37,905	\$58,847	155%	Refer to Capital Works Program
13259120	Loan 128 LA Caravan Park Assets - Principal Repayment	\$18,900	\$11,025	\$0	0%	Refer to Capital Works Program
14404250	Plant Expendable Stores/Workshop	\$32,000	\$18,662	\$5,403	29%	Lower than anticipated expenditure to date
14717106	Reimbursements & Other Charges With GST	\$0	\$0	(\$34,359)		Electricity and various reimbursements
14718128	Sale Of Land	\$0	\$0	(\$195,000)		Sale of Old Moolabeenee Road property
14759211	Transfer To Reserve (L&B) Funds	\$0	\$0	\$195,000		Refer to Capital Works Program
		\$388,639	\$248,423	\$202,866		

Fixed Assets Expenditure January 2018

Asset Type	YTD Budget	YTD Actual (incl. Committed Costs)
Fixed Assets-Buildings	\$893,808	\$259,738
Fixed Assets-Furniture\Fitting	\$62,104	\$48,966
Fixed Assets-Land	\$66,656	\$847
Fixed Assets-Plant & Equipment	\$483,593	\$499,738
Infrastructure - Footpaths	\$66,664	\$0
Infrastructure Assets - Parks	\$1,104,144	\$849,217
Infrastructure Assets - Roads	\$2,657,600	\$1,263,008
Infrastructure Other	\$107,984	\$48,621
	\$5,442,553	\$2,970,134

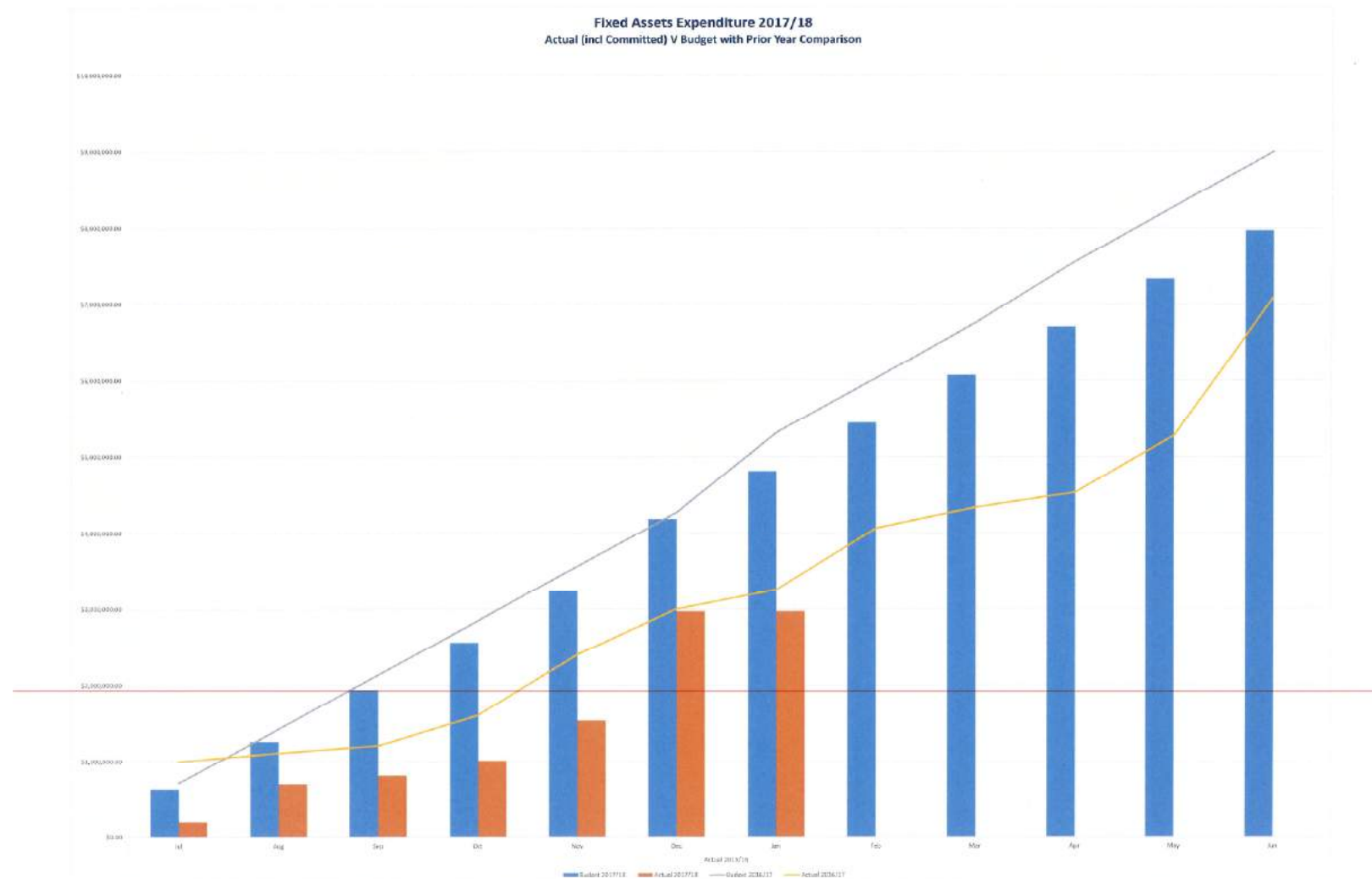


Fixed Assets Expenditure January 2018

Account #	Account Description	Budget	Budget YTD	Actual YTD (incl Committed Costs)	% Total Budget
5159129	Nilgen Fire Shed Construction	\$110,000	\$73,328	\$62,499	56.82%
6259020	Aged Homes Lancelin	\$90,362	\$60,232	\$24,682	27.31%
6259030	Aged Homes Gingin - Design and Construction	\$700,000	\$466,664	\$0	0.00%
6259040	Wangaree Day Centre - DADAA (operating expense - journal required)	\$0	\$0	\$2,073	100.00%
6259050	Gingin Aged Units (Air-conditioning, kitchen refurbishments, floor coverings)	\$40,800	\$27,192	\$7,150	17.52%
7159106	Gingin Medical Centre (New)	\$10,000	\$6,664	\$58	0.58%
9159003	57A Lefroy Street - Building Capital A/C (operating purchase order)	\$0	\$0	\$118	100.00%
10259217	Ablution Facility Guilderton Foreshore	\$0	\$0	\$21,041	100.00%
11159005	Granville Civic Centre Buildings	\$86,240	\$57,496	\$0	0.00%
11359049	Gingin Golf Club - Re-roof Club House	\$9,488	\$6,320	\$9,488	100.00%
11359051	Gingin Bowling Club - Patio roof extension & disabled ramp	\$48,500	\$32,328	\$0	0.00%
11359090	GG Recreation Centre Building Land & Buildings	\$37,829	\$25,216	\$0	0.00%
11359157	Gingin Horseman's Club Campdraft Facility	\$12,500	\$8,328	\$292	2.34%
11359177	LA - Gun Club Transportable Toilet and Water to Site	\$25,000	\$16,664	\$22,727	90.91%
11359179	LA - Bowling Club Storage Shed & Shade Shelters	\$9,500	\$6,328	\$0	0.00%
11359183	LP - Bowling Club - Synthetic Green	\$5,000	\$3,328	\$0	0.00%
11659315	Old Granville Building	\$12,000	\$7,992	\$3,740	31.17%
12259691	Bus Shelters (operating expense - journal required)	\$0	\$0	\$3,333	100.00%
12259956	Redfield Park - Bus Shelter	\$25,625	\$17,080	\$0	0.00%
13259065	Caravan Park Chalets	\$64,990	\$43,320	\$95,538	147.00%
13259300	Information Bays	\$28,000	\$18,664	\$0	0.00%
14759140	CWA Building - Structural Repairs	\$25,000	\$16,664	\$7,000	28.00%
4159110	Council Chambers Furniture	\$5,125	\$3,416	\$0	0.00%
4159115	Council Furniture & Equipment (refer account 4159110)	\$0	\$0	\$2,937	100.00%
7459010	Furniture And Equipment	\$2,300	\$1,528	\$1,388	60.35%
10159004	Landfill Site POS Equipment	\$6,100	\$4,064	\$4,111	67.39%
10659040	Planning Equipment	\$2,500	\$1,656	\$1,583	63.32%
11559020	Lancelin Library Furniture and Equipment	\$1,500	\$1,000	\$0	0.00%
13259060	GU Caravan Park Furniture/fitings	\$9,000	\$6,000	\$9,600	106.67%
13359010	Furniture And Equipment	\$1,700	\$1,128	\$0	0.00%
14259110	Computer System Furniture And Equipment	\$32,516	\$21,656	\$12,192	37.50%
14259115	Office Furniture/Equip. Furniture And Equipment	\$32,500	\$21,656	\$12,848	39.53%
14359110	Depot - Furniture And Equipment (funded from operating budget)	\$0	\$0	\$3,845	100.00%
14759122	Master Key System (operating expense - journal required)	\$0	\$0	\$460	100.00%
10159000	Landfill Site Implementation	\$60,000	\$40,000	\$0	0.00%

Account #	Account Description	Budget	Budget YTD	Actual YTD (incl Committed Costs)	% Total Budget
11159010	Guilderton Hall Carpark (operating expense - journal required)	\$0	\$0	\$313	100.00%
14759124	Lancelin Commercial Centre Land Purchase	\$40,000	\$26,656	\$534	1.34%
5159200	Fire Warning Signs	\$60,000	\$40,000	\$60,000	100.00%
5359020	Ranger/Fly Utility Purchase GG074	\$21,200	\$14,136	\$21,200	100.00%
7459001	Vehicle Purchase - 6GG (5GG budget) EHO	\$43,000	\$43,000	\$43,008	100.02%
12359202	Kanga Loader	\$44,129	\$44,129	\$44,129	100.00%
12359937	Kanga Trailer	\$7,868	\$7,868	\$7,868	100.00%
12359750	Minor Plant/Equipment	\$15,000	\$10,000	\$10,534	70.23%
12359916	TCM Front End Loader GG016	\$313,000	\$313,000	\$313,000	100.00%
14759226	Generator - Shire Office (Gingin)	\$29,000	\$19,328	\$0	0.00%
12259990	Footpath projects unallocated	\$100,000	\$66,664	\$0	0.00%
11259065	Lancelin Foreshore Development - Cunliffe St	\$150,000	\$100,000	\$0	0.00%
11259077	Guilderton Beach Access Boardwalk	\$89,000	\$59,328	\$11,610	13.04%
11259079	Boat Launch Facility - Planning Study	\$109,421	\$72,944	\$55,675	50.88%
11259081	LA Hinchcliffe Hill Staircase South Side	\$100,000	\$66,664	\$0	0.00%
11259082	LA Hinchcliffe Hill Ramp North Side	\$60,000	\$40,000	\$0	0.00%
11259083	LA Hinchcliffe Hill Pathway and Carpark	\$82,125	\$54,744	\$0	0.00%
11359042	GG Swim Pool Plant & Pump Room	\$23,000	\$15,328	\$10,053	43.71%
11359115	LA Skate Park Bowl (at BMX Track)	\$126,000	\$84,000	\$94,182	74.75%
11359124	LA 1/2 Basketball Court	\$15,000	\$10,000	\$0	0.00%
11359132	Playground Equipment	\$36,772	\$24,512	\$33,874	92.12%
11359133	LP Playground Equipment	\$135,949	\$90,632	\$136,541	100.44%
11359155	Bendigo Bank Complex	\$9,000	\$6,000	\$175	1.94%
11359171	Regional Hardcourt Facility - Bank Stabilisation & Landscaping	\$165,000	\$110,000	\$0	0.00%
11359248	GG - Granville Park Playground Swings (operating expense - journal required)	\$0	\$0	\$108	100.00%
11359268	Lancelin Golf Club Bore and Pump	\$100,000	\$66,664	\$60,000	60.00%
13259068	Lancelin Caravan Park - Infrastructure Parks	\$355,000	\$236,664	\$354,919	99.98%
13259314	Caravan Park Retaining Wall	\$60,000	\$40,000	\$60,000	100.00%
13259315	Caravan Park Tap and Pipe Replacement Bays	\$40,000	\$26,664	\$32,080	80.20%
12259160	Cowalla Road Bridge Upgrade	\$190,000	\$126,664	\$0	0.00%
12259161	Marchmont Drainage	\$160,000	\$106,664	\$0	0.00%
12259169	Rural - Dingo Road (Budget Amendment Required to fund Ferguson/Walker Avenue/Lancelin Road/KW Road)	\$592,724	\$395,136	\$0	0.00%
12259170	Rural - Mimegarra Road	\$290,764	\$193,824	\$0	0.00%
12259199	Rural - Breera Road (Outstanding Purchase Order maintenance)	\$0	\$0	\$4,491	100.00%
12259211	Guilderton - Mortimer St	\$44,800	\$29,864	\$0	0.00%
12259222	Lancelin - Lancelin Plaza	\$10,000	\$6,664	\$2,522	25.22%
12259233	Craig Sandy Reseal SLK 0.00 - 0.32	\$5,512	\$3,672	\$0	0.00%
12259235	Bateman Way Reseal SLK 0.00 - 2.00	\$6,064	\$4,040	\$0	0.00%
12259236	Jones Place Reseal SLK 0.00 - 0.07	\$1,929	\$1,280	\$0	0.00%

Account #	Account Description	Budget	Budget YTD	Actual YTD (incl Committed Costs)	% Total Budget
12259240	Rural - Beermullah Road West	\$134,546	\$89,696	\$0	0.00%
12259259	Ashby Road Reseal SLK 0.00 - 3.00	\$187,329	\$124,880	\$0	0.00%
12259262	Rural - Red Gully Road	\$399,034	\$266,000	\$0	0.00%
12259271	RP - Redfield Park (operating expense - journal required)	\$0	\$0	\$58	100.00%
12259277	Link Road - Reseal SLK 0.00-0.15	\$3,256	\$2,168	\$0	0.00%
12259278	St Andrews Court - Reseal SLK 0.00-0.57	\$12,175	\$8,112	\$0	0.00%
12259279	Military Road - Centreline SLK 0.00-14.79	\$40,000	\$26,664	\$0	0.00%
12259306	GG - Brockman Street/Cheriton Road Intersection	\$78,015	\$52,008	\$84,850	108.76%
12259326	Rural - Ferguson Road Construct/Seal Intersection (Budget Amendment funded from Dingo Road)	\$0	\$0	\$83,366	100.00%
12259332	Rural - Cowalla Rd	\$125,000	\$83,328	\$89,776	71.82%
12259339	R to R - Rural - Cullalla Rd	\$45,000	\$30,000	\$272	0.60%
12259353	Old North Road Drive/Walk Trail	\$22,935	\$15,288	\$286	1.25%
12259501	Black Spot - Dewar Road	\$259,441	\$172,936	\$215	0.08%
12259959	RRG - Gingin Brook Road - Final Seal	\$86,527	\$57,680	\$0	0.00%
12259961	RRG - Gingin Brook Road	\$893,066	\$595,352	\$762,519	85.38%
12259982	Drainage Construction	\$21,538	\$14,352	\$4,500	20.89%
12259993	R to R - Murray Bridge works	\$129,778	\$86,512	\$144,698	111.50%
12259996	Rural - Fynes Road Resheet SLK 0.00-5.32	\$247,242	\$164,816	\$85,456	34.56%
10159030	Gingin Landfill Fencing	\$7,000	\$4,664	\$0	0.00%
10759128	Gingin Cemetery Fence and Driveway	\$31,000	\$20,664	\$0	0.00%
12259362	Streetscape Project - Lancelin	\$70,000	\$46,664	\$3,816	5.45%
12259994	Parking Meters - Guilderton (Budget Amendment - installation costs)	\$0	\$0	\$1,440	100.00%
13259312	Caravan Waste Dump Points	\$3,000	\$2,000	\$35	1.17%
13259313	Caravan Park Drainage	\$50,000	\$33,328	\$43,330	86.66%
14759225	Gingin Flag Poles	\$1,000	\$664	\$0	0.00%
		\$7,972,214	\$5,450,421	\$2,970,134	



SHIRE OF GINGIN
INTERIM MONTHLY STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

	NOTE	Jan 2017/2018 Y-T-D Actual \$	2017/2018 Y-T-D Budget \$	2017/2018 Budget \$	Variances Budget to Actual Y-T-D %
Net current assets at start of year - surplus/(deficit)		1,931,712	2,009,010	2,009,010	0.00%
Revenue from operating activities (excluding rates and non-operating grants, subsidies & contributions)					
Governance		2,095	0	0	0.00%
General Purpose Funding		525,458	682,686	1,170,319	(13.43%)
General Purpose Funding - Rates		7,742,176	7,764,606	7,764,606	(0.29%)
Law, Order, Public Safety		228,409	197,798	339,083	9.03%
Education and Welfare		65,768	169,167	290,000	(35.65%)
Health		278,408	68,250	117,000	179.62%
Housing		13,120	13,650	23,400	(2.26%)
Community Amenities		1,389,646	970,106	1,663,038	25.23%
Recreation and Culture		118,964	96,033	164,628	13.93%
Transport		130,863	144,694	248,046	(5.58%)
Economic Services		1,149,160	1,125,952	1,930,203	1.20%
Other Property and Services		509,820	126,321	216,550	177.10%
		12,153,887	11,359,262	13,926,873	5.71%
Expenditure from operating activities					
Governance		(641,312)	(654,470)	(1,121,949)	(1.17%)
General Purpose Funding		(224,735)	(216,783)	(371,628)	2.14%
Law, Order, Public Safety		(664,598)	(782,678)	(1,341,733)	(8.80%)
Education and Welfare		(82,236)	(377,968)	(647,945)	(45.64%)
Health		(480,445)	(122,023)	(209,182)	171.34%
Housing		(32,325)	(17,768)	(30,460)	47.79%
Community Amenities		(1,174,332)	(1,546,415)	(2,650,997)	(14.04%)
Recreation & Culture		(1,552,246)	(1,741,130)	(2,984,794)	(6.33%)
Transport		(1,342,377)	(2,462,000)	(4,220,571)	(26.53%)
Economic Services		(808,846)	(954,121)	(1,635,636)	(8.88%)
Other Property and Services		(442,755)	(410,421)	(703,579)	4.60%
		(7,446,208)	(9,285,777)	(15,918,474)	(11.56%)
Operating activities excluded from budget					
(Profit)/Loss on Asset Disposals	2	77,945	0	0	0.00%
Depreciation on Assets	10	956,362	2,555,954	4,381,636	(36.51%)
Non-Cash Expenditure and Revenue		84	0	0	0.00%
Leave Entitlements		0	0	0	0.00%
Amount attributable to operating activities		5,742,070	6,638,450	4,399,045	(20.38%)
Investing Activities					
Non operating grants, subsidies & contributions		417,332	1,218,909	2,089,559	(38.36%)
Purchase Land Held for Resale	1	0	0	0	0.00%
Purchase Land and Buildings	1	(244,042)	(845,153)	(1,448,834)	(41.49%)
Purchase Infrastructure Assets - Roads	1	(1,127,698)	(2,325,561)	(3,986,675)	(30.05%)
Purchase Infrastructure Assets - Parks	1	(774,680)	(962,656)	(1,650,267)	(11.39%)
Purchase Infrastructure Assets - Other	1	(44,770)	(94,500)	(162,000)	(30.70%)
Purchase Infrastructure Assets - Footpaths	1	0	(58,333)	(100,000)	(58.33%)
Purchase Tools		0	0	0	0.00%
Purchase Plant and Equipment	1	(208,778)	(60,667)	(104,000)	142.41%
Purchase Furniture and Equipment		(48,331)	(54,391)	(93,241)	(6.50%)
Proceeds from Disposal of Assets	2	113,998	0	0	0.00%
		(1,916,968)	(3,182,351)	(5,455,459)	(23.19%)
Financing Activities					
Repayment of Debentures	3	(124,131)	(131,802)	(225,947)	(3.40%)
Proceeds from New Debentures	3	200,000	525,000	900,000	(36.11%)
New Self Supporting Loans		0	0	0	0.00%
New Advances		0	0	0	0.00%
Proceeds from Advances		5,556	6,581	11,281	(9.08%)
Self-Supporting Loan Principal Income		5,111	17,401	29,831	(41.20%)
Transfers to Reserves (Restricted Assets)	4	(220,047)	323,269	554,176	(98.04%)
Transfers from Reserves (Restricted Assets)	4	0	(561,052)	(961,803)	(58.33%)
Transfers from Restricted Cash			436,844	748,876	(58.33%)
		(133,511)	616,242	1,056,414	(70.97%)
Net Current Assets Year to Date		5,623,303	4,072,340	0	

This statement is to be read in conjunction with the accompanying notes.
Note: Difference in B/Fwd balance relates to End of year adjustments.

SHIRE OF GINGIN
MONTHLY STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

1. ACQUISITION OF ASSETS & OTHER NON CAPITAL EXPENDITURE	Jan 2017/2018 Y-T-D Actual \$	2017/2018 Budget \$
The following assets and other non capital expenditure have been acquired/paid for during period under review.		
<u>By Program</u>		
Governance	2,937	5,000
General Purpose Funding	25,047	121,487
Law, Order, Public Safety	106,687	542,500
Health	73,155	69,387
Education and Welfare	33,255	20,000
Housing	0	21,000
Community Amenities	91,334	1,032,974
Recreation and Culture	447,911	1,450,231
Transport	1,191,668	5,405,419
Economic Services	571,404	340,693
Other Property and Services	249,078	270,653
	<u>2,792,476</u>	<u>9,279,344</u>
<u>By Class</u>		
Land and Buildings	244,042	1,168,000
Infrastructure Assets - Roads	1,127,698	3,755,483
Infrastructure Assets - Parks and Ovals	774,680	856,915
Infrastructure Assets - Other	44,770	1,294,513
Infrastructure - Footpaths	0	44,436
Plant and Equipment	208,778	1,718,241
Furniture and Fittings	48,331	92,716
Tools	0	0
Loans Current	124,131	187,783
Provisions	0	0
Transfers to Reserve	220,047	161,267
	<u>2,792,476</u>	<u>9,279,344</u>

A detailed breakdown of acquisitions on an individual asset basis can be found in the supplementary information attached to this statement as follows:

SHIRE OF GINGIN
MONTHLY STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

2. DISPOSALS OF ASSETS

The following assets have been disposed of during the period under review:

	Net Book Value	Sale Proceeds	Profit(Loss)
<u>By Program</u>	Jan 2017/2018 Y-T-D Actual \$	Jan 2017/2018 Y-T-D Actual \$	Jan 2017/2018 Y-T-D Actual \$
Law Order & Public Safety	0	0	0
Health	11,196	18,182	(6,986)
Community Amenities	44,707	48,182	(3,475)
Transport	(19,850)	47,635	(67,485)
Economic Services	0	0	0
Other Property & Services	0	0	0
	36,053	113,998	(77,945)
<u>By Class</u>	Jan 2017/2018 Y-T-D Actual \$	Jan 2017/2018 Y-T-D Actual \$	Jan 2017/2018 Y-T-D Actual \$
Plant & Equipment	36,053	113,998	(77,945)
Land & Buildings	0	0	0
	36,053	113,998	(77,945)
<u>Summary</u>	Profit(Loss)		
	2017/2018 Y-T-D Actual \$		
Profit on Asset Disposals	16,889		
Loss on Asset Disposals	(94,834)		
	(77,945)		

SHIRE OF GINGIN
NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

3. INFORMATION ON BORROWINGS

(a) Debenture Repayments

Particulars	Principal 1-Jul-17	New Loans Actual	New Loans Budget	Principal Repayments		Principal Outstanding		Interest Repayments	
				Actual \$	Budget \$	Actual \$	Budget \$	Actual \$	Budget \$
Health									
L100 GG Medical Centre	209,564			24,424	24,425	185,140	185,139	13,252	13,252
Housing									
L129 Aged Accomodation	0	0	0	0	0	0	700,000	0	0
Community Amenities									
L111 Tip Rationalisation Site	484,873		5,180	7,646	15,540	477,227	469,333	15,734	31,220
L127 - SB Erosion Extension	204,422		6,436	19,309	19,309	185,113	185,113	5,011	5,011
Recreation & Culture									
L114 Gu C/Club	463,497		9,651	14,222	28,952	449,275	434,545	16,547	32,586
L115 Gu C/Club	13,453		4,484	6,608	13,453	6,845	0	482	728
L119 LP Country Club & Granville Civic Centre	8,445		2,815	4,149	8,445	4,297	0	304	459
L120 Regional Netball Facility	322,973		6,093	8,989	18,278	313,984	304,695	10,787	21,274
L124A Regional Hardcourt Facility	312,626		6,200	9,204	18,599	303,421	294,027	6,456	12,721
L126 Swimming Pool	136,990		4,472	6,657	13,416	130,333	123,574	2,123	4,144
Economic Services									
L103 Gingin Sale Yards	12,340			2,949	5,987	9,391	6,353	365	654
L128 Lancelin Caravan Park	0	0	6,300	0	18,900	0	181,100	0	2,500
Other Property & Services									
L93 LA Angling/Aquatic	10,391		3,464	5,111	10,391	5,280	0	339	511
L118 Office Extensions	16,826		5,609	8,265	16,826	8,562	0	605	913
L123 Purchase Lot 44 Weld Street GG	212,827		4,475	6,598	13,426	206,228	199,401	7,406	14,583
			0						
	2,409,227	0	75,316	124,131	225,947	2,285,097	3,083,280	79,411	140,556

SHIRE OF GINGIN
NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

3. INFORMATION ON BORROWINGS (continued)

		Interest Actual
(a) Debenture Repayments		\$
Repayment of Principal for Council Funded Loans will be	112,412 Interest on Council Funded Loans	78,590
Repayment of Principal for Self Supporting Loans will be	11,719 Interest on Self Supporting Loans	821
	<u>\$124,131</u>	<u>\$79,411</u>
 (b) New Debentures		
Nil		

SHIRE OF GINGIN
NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

4. RESERVES	Jan Y-T-D Actual \$	2017/2018 Budget \$
Cash Backed Reserves		
(a) Long Service Leave, Sick Leave, Staff Contingency		
Opening Balance	513,063	513,063
Amount Set Aside / Transfer to Reserve	3,859	10,725
Amount Used / Transfer from Reserve	-	-
	<u>516,922</u>	<u>523,788</u>
(b) Office Equipment Replacement		
Opening Balance	17,486	17,486
Amount Set Aside / Transfer to Reserve	132	366
Amount Used / Transfer from Reserve	-	(15,000)
	<u>17,618</u>	<u>2,852</u>
(c) Plant & Equipment Replacement		
Opening Balance	153,129	153,129
Amount Set Aside / Transfer to Reserve	1,152	818,201
Amount Used / Transfer from Reserve	-	-
	<u>154,281</u>	<u>971,330</u>
(d) Land & Buildings General		
Opening Balance	753,210	653,210
Amount Set Aside / Transfer to Reserve	200,665	83,811
Amount Used / Transfer from Reserve	-	(75,000)
	<u>953,875</u>	<u>662,021</u>
(e) Guilderton Caravan Park Recreation		
Opening Balance	222,713	222,713
Amount Set Aside / Transfer to Reserve	1,675	1,283
Amount Used / Transfer from Reserve	-	(90,000)
	<u>224,388</u>	<u>133,996</u>
(f) Shire Recreational Development		
Opening Balance	204,380	304,380
Amount Set Aside / Transfer to Reserve	1,537	4,272
Amount Used / Transfer from Reserve	-	(220,000)
	<u>205,917</u>	<u>88,652</u>
(g) Redfield Park Public Open Space		
Opening Balance	29,762	29,762
Amount Set Aside / Transfer to Reserve	224	622
Amount Used / Transfer from Reserve	-	-
	<u>29,986</u>	<u>30,384</u>

SHIRE OF GINGIN

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

	Jan Y-T-D Actual \$	2017/2018 Budget \$
RESERVES (continued)		
(h) Ocean Farm Recreation		
Opening Balance	36,564	36,564
Amount Set Aside / Transfer to Reserve	275	764
Amount Used / Transfer from Reserve	-	(7,237)
	<u>36,839</u>	<u>30,091</u>
(i) Tip Rationalisation		
Opening Balance	697,171	697,171
Amount Set Aside / Transfer to Reserve	5,244	14,573
Amount Used / Transfer from Reserve	-	(87,399)
	<u>702,415</u>	<u>624,345</u>
(j) Lancelin Community Sporting Club		
Opening Balance	49,002	49,002
Amount Set Aside / Transfer to Reserve	369	13,524
Amount Used / Transfer from Reserve	-	(10,000)
	<u>49,370</u>	<u>52,526</u>
(k) Community Infrastructure Reserve		
Opening Balance	87,429	87,429
Amount Set Aside / Transfer to Reserve	658	1,828
Amount Used / Transfer from Reserve	-	-
	<u>88,086</u>	<u>89,257</u>
(l) Staff Housing Reserve		
Opening Balance	31,740	31,740
Amount Set Aside / Transfer to Reserve	239	663
Amount Used / Transfer from Reserve	-	-
	<u>31,979</u>	<u>32,403</u>
(m) Future Infrastructure Reserve		
Opening Balance	531,524	531,524
Amount Set Aside / Transfer to Reserve	3,998	11,111
Amount Used / Transfer from Reserve	-	(244,240)
	<u>535,522</u>	<u>298,395</u>
(n) Guilderton Country Club Reserve		
Opening Balance	2,852	2,852
Amount Set Aside / Transfer to Reserve	21	60
Amount Used / Transfer from Reserve	-	-
	<u>2,873</u>	<u>2,912</u>
Total Cash Backed Reserves	<u>3,550,069</u>	<u>3,542,952</u>

All of the above reserve accounts are supported by money held in financial institutions.

SHIRE OF GINGIN

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

	Jan Y-T-D Actual \$	2017/2018 Budget \$
4. RESERVES (Continued)		
Summary of Transfers		
To Cash Backed Reserves		
Transfers to Reserves		
Transfers to Reserves		
Long Service Leave, Sick Leave, Staff Contingency	3,659	10,725
Office Equipment Replacement	132	366
Plant & Equipment Replacement	1,152	818,201
Land & Buildings General	200,665	83,811
Guilderton Caravan Park Recreation	1,675	1,283
Shire Recreational Development	1,537	4,272
Redfield Park Public Open Space	224	622
Ocean Farm Recreation	275	764
Tip Rationalisation	5,244	14,573
Lancelin Community Sporting Club	369	13,524
Community Infrastructure	658	1,828
Staff Housing Reserve	239	663
Guilderton Country Club Reserve	21	60
Future Infrastructure Reserve	3,998	11,111
	<u>220,047</u>	<u>961,803</u>
Transfers from Reserves		
Long Service Leave, Sick Leave, Staff Contingency	-	-
Office Equipment Replacement	-	(15,000)
Plant & Equipment Replacement	-	-
Land & Buildings General	-	(75,000)
Guilderton Caravan Park Recreation	-	(90,000)
Shire Recreational Development	-	(220,000)
Redfield Park Public Open Space	-	-
Ocean Farm Recreation	-	(7,237)
Tip Rationalisation	-	(87,399)
Lancelin Community Sporting Club	-	(10,000)
Community Infrastructure	-	-
Staff Housing Reserve	-	-
Guilderton Country Club Reserve	-	-
Future Infrastructure Reserve	-	(244,240)
	<u>-</u>	<u>(748,876)</u>
Total Transfer to/(from) Reserves	<u>220,047</u>	<u>212,927</u>

In accordance with council resolutions in relation to each reserve account, the purpose for which the reserves are set aside are as follows: for which the reserves are set aside are as follows:

Long Service Leave, Sick Leave, Staff Contingency

Used to fund annual, long service leave, rostered days off (executive staff only), sick leave redundancy/retirement and staff contingency

SHIRE OF GINGIN

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 TO 31 JANUARY 2018

Office Equipment Replacement Reserve

Used for the acquisition and/or replacement of major items of office equipment (including computer system)

Plant and Equipment Reserve

Used for the purchase of major plant and equipment

Land and Building General Reserve

Used for the replacement and/or acquisition of land and buildings

Guilderton Caravan Park Recreation

Used for the development of Guilderton Caravan Park facilities

Shire Recreational Development Reserve Shire Recreational Development Reserve

Used for the development of Shire Recreational facilities

Redfield Park Public Open Space Reserve

Used for the development of Public Open Space within the Redfield Park subdivision

Ocean Farm Recreation

Used for the development of recreation and community facilities within the Ocean Farm subdivision

Tip Rationalisation

Used for rationalisation of rubbish tip facilities within the Shire

Plant & Equipment/Infrastructure Replacement

Used for replacement of Fire Equipment and Infrastructure for fire fighting purposes within the Shire

Lancelin Community Sporting Club Reserve

Used in developing building and other associated infrastructure at the Lancelin Community Sporting Club and are to be spent upon request from the Club, and approval from Council

Community Infrastructure Reserve

Used to assist in the financing of community facilities

Staff Housing Contingency

Staff housing infrastructure additions and/or replacement

Future Infrastructure Reserve

Used for the provision of renewal, upgrade and asset purchases

SHIRE OF GINGIN
NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

	Actual Jan 2017/2018 Y-T-D Actual \$	Actual Brought Forward 1-Jul \$
5. NET CURRENT ASSETS		
Composition of Estimated Net Current Asset Position		
CURRENT ASSETS:		
Cash - Unrestricted	3,015,806	994,821
Cash - Restricted Reserves	4 3,550,069	3,330,023
Cash - Restricted General	884,991	909,991
Rates - Current	1,966,295	859,216
Sundry Debtors	500,786	1,160,020
Inventories	15,351	26,713
	<u>9,933,298</u>	<u>7,280,784</u>
LESS: CURRENT LIABILITIES		
Payables	(147,269)	(1,375,787)
Employee Provisions	(612,656)	(612,656)
Accrued Interest on Loans	0	(30,606)
	<u>(759,925)</u>	<u>(2,019,049)</u>
	9,173,373	5,261,735
Less: Cash - restricted reserves	4 (3,550,069)	(3,330,023)
NET CURRENT ASSET POSITION	<u><u>5,623,303</u></u>	<u><u>1,931,712</u></u>

SHIRE OF GINGIN
NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

6. RATING INFORMATION

<u>RATE TYPE</u>	<u>Rate in \$</u>	<u>Number of Properties</u>	<u>Rateable Value \$</u>	<u>2017/2018 Rate Revenue \$</u>	<u>2017/2018 Interim Rates \$</u>	<u>2017/2018 Back Rates \$</u>	<u>2017/2018 Total Revenue \$</u>	<u>2017/2018 Budget \$</u>
General Rate								
GRV - Townsites	0.083499	1,743	28,508,235	2,380,547			2,380,547	2,380,547
GRV - Other	0.083499	923	14,815,362	1,267,167			1,267,167	1,267,167
UV - Rural	0.004504	422	286,427,000	1,287,887			1,287,887	1,287,887
UV - Other	0.004504	1	2,800,000	12,611			12,611	12,611
UV - Intensive	0.008448	184,468	64,543,000	553,403			553,403	553,403
Interim Rates					15,606		15,606	25,000
Back Rates						747	747	10,000
Sub-Totals		1,833,872	397,093,597	5,501,615	15,606	747	5,517,969	5,536,615
Minimum Rates	Minimum \$							
GRV - Townsites	997	289,795	6,752,442	869,384			869,384	869,384
GRV - Other	997	242,936	4,133,426	728,807			728,807	728,807
UV - Rural	1260	158,340	74,924,300	475,020			475,020	475,020
UV - Other	1260	10,080	675,764	30,240			30,240	30,240
UV - Intensive	2,240	71,680	15,554,347	215,040			215,040	215,040
Sub-Totals		772,830	102,040,279	2,318,491	0	0	2,318,491	2,318,491
Concessions					(94,284)		(94,284)	(95,000)
Rate Write Off							0	0
Ex-Gratia Rates							0	4,500
Totals		2,606,702	499,133,876	7,820,106	(78,678)	747	7,742,176	7,764,606

SHIRE OF GINGIN

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

7. TRUST FUNDS

Funds held at balance date over which the Municipality has no control and which are not included in this statement are as follows:

Detail	Balance 01-Jul-17 \$	Amounts Received \$	Amounts Paid (\$)	Jan Y-T-D Actual \$
Bonds, Tenders etc	9,117			9,117
Car Parking Cash in Lieu	13,014			13,014
Community Groups	4,293			4,293
Councillors Nominations	-			-
D Wedge Trust	6,314	13		6,327
Excavation Bonds	26,096			26,096
Footpath Bonds	5,982			5,982
Landscaping Bonds	49,767			49,767
Old Junction Hotel Restoration	1,743			1,743
Other Bonds/Trusts	21,457	2,863	3,969	20,351
Public Open Space	34,465			34,465
Rehabilitation Bonds	85,831			85,831
Second Hand Buildings	47,639		5,000	42,639
Staff Trust	16,880	22,344	33,343	5,881
Subdivision Bonds	207,138			207,138
Tree Planting Bonds	5,456			5,456
Trust Interest	0	2,244	26	2,218
	535,193	27,463	42,338	520,318

SHIRE OF GINGIN

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

8. OPERATING STATEMENT

	Jan 2017/2018 Y-T-D Actual \$	2017/2018 Budget \$	2016/2017 Actual \$
OPERATING REVENUES			
Governance	1,139	0	534
General Purpose Funding	8,267,633	8,934,925	10,555,255
Law, Order, Public Safety	228,409	449,083	779,095
Health	278,408	290,000	246,157
Education and Welfare	65,764	117,000	127,217
Housing	13,120	23,400	24,280
Community Amenities	1,389,754	1,663,038	2,335,826
Recreation and Culture	274,965	600,694	575,412
Transport	392,088	1,791,539	1,811,071
Economic Services	1,149,160	1,930,203	1,983,912
Other Property and Services	509,820	216,550	336,435
Restricted Cash	(24,041)	45,000	(626,578)
TOTAL OPERATING REVENUE	12,546,219	16,061,432	18,148,616
OPERATING EXPENSES			
Governance	(640,494)	(1,121,949)	(1,003,716)
General Purpose Funding	(224,735)	(371,628)	(425,934)
Law, Order, Public Safety	(664,598)	(1,341,733)	(1,484,151)
Health	(455,445)	(647,945)	(853,712)
Education and Welfare	(82,236)	(209,182)	(180,186)
Housing	(32,325)	(30,460)	(29,725)
Community Amenities	(1,174,332)	(2,650,997)	(2,250,652)
Recreation & Culture	(1,552,246)	(2,984,794)	(3,169,400)
Transport	(1,342,377)	(4,220,571)	(2,082,557)
Economic Services	(808,846)	(1,635,636)	(1,652,775)
Other Property and Services	(442,755)	(703,570)	(1,287,904)
Restricted Cash	(818)	509,176	0
TOTAL OPERATING EXPENSE	(7,421,208)	(15,409,289)	(14,420,713)
CHANGE IN NET ASSETS RESULTING FROM OPERATIONS	5,125,011	652,143	3,727,903

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NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2017 to 31 JANUARY 2018

9. STATEMENT OF FINANCIAL POSITION

	Jan 2017/18 Y-T-D Actual \$	2016/2017 Actual \$
CURRENT ASSETS		
Cash Assets	3,900,797	1,904,812
Reserves - Cash Backed	3,550,069	3,330,023
Receivables - Cash	2,467,081	1,991,420
Receivables - Non Cash	30,446	40,593
Inventories	15,351	26,713
TOTAL CURRENT ASSETS	9,963,744	7,293,562
NON-CURRENT ASSETS		
Receivables	148,898	149,418
Inventories	-5	0
Property, Plant and Equipment	50,836,380	55,108,739
Infrastructure	104,902,476	99,969,173
TOTAL NON-CURRENT ASSETS	155,887,749	155,227,330
TOTAL ASSETS	165,851,493	162,520,891
CURRENT LIABILITIES		
Payables	147,269	1,338,110
Accrued Interest on Debentures	0	30,606
Interest-bearing Liabilities	82,916	0
Provisions	612,656	688,185
TOTAL CURRENT LIABILITIES	842,841	2,056,901
NON-CURRENT LIABILITIES		
Interest-bearing Liabilities	2,402,180	2,409,227
Provisions	262,497	152,503
TOTAL NON-CURRENT LIABILITIES	2,664,677	2,561,730
TOTAL LIABILITIES	3,507,518	4,618,631
NET ASSETS	162,343,975	157,902,260
EQUITY		
Reserves - Asset Revaluation	107,571,075	106,207,280
Reserves - Cash Backed	3,550,069	3,330,023
Retained Surplus	51,222,830	48,364,957
TOTAL EQUITY	162,343,975	157,902,260

APPENDIX 2

LIST OF ACCOUNTS PAID BY COUNCIL SUBMITTED TO THE
COUNCIL MEETING HELD JANUARY 2018

TYPE	DATE PAID NAME	DETAILS	AMOUNT
Chq/EFT			
EFT23489	08/01/2018 RSPCA WA (INC.)	PAYROLL DEDUCTIONS	10.00
EFT23490	08/01/2018 LGRCEU (WA DIVISION)	PAYROLL DEDUCTIONS	82.00
EFT23491	08/01/2018 HIF	PAYROLL DEDUCTIONS	157.55
EFT23492	08/01/2018 SOCIAL CLUB	PAYROLL DEDUCTIONS	1334.00
EFT23493	08/01/2018 TONY PISCONERI	MANAGEMENT FEES SEABIRD LANDFIL	15180.00
EFT23494	08/01/2018 COUNTRY COPIERS NORTHAM	PHOTOCOPIER METER READING	2683.64
EFT23495	08/01/2018 CELLARBRATIONS GINGIN	RESTOCK BAR	69.00
EFT23496	08/01/2018 MOORE CATCHMENT COUNCIL	ANNUAL CONTRIBUTION	2200.00
EFT23497	08/01/2018 BUILDING COMMISSION	BSL REMITTANCE - NOVEMBER 2017	3041.00
EFT23498	08/01/2018 LANCELIN FABRICATION	HAND RAILS FOR LP COUNTRY CLUB	950.00
EFT23499	08/01/2018 WALGA	WALGA FBT WORKSHOP K LEONHARDT	660.00
EFT23500	08/01/2018 SHIELDS POWER CLEAN	HALL AND BUS CLEAN - NOV 17	1200.00
EFT23501	08/01/2018 UNREAL KIDS PARTIES	PARTY IN THE PARK - SUNDAY 7TH JAN	419.00
EFT23502	08/01/2018 JOONDALUP DRIVE MEDICAL CENTRE	BASELINE MEDICAL - JODIE MORTADZA	130.00
EFT23503	08/01/2018 ELEMENTS TREE SOLUTIONS PTY LTD	TREE LOPPING	1900.00
EFT23504	08/01/2018 CASTLES R US	AUSTRALIA DAY ENTERTAINMENT	510.00
EFT23505	08/01/2018 DFES	ESL RECEIVED DURING NOVEMBER 2017	19128.70
EFT23506	08/01/2018 BUILDING COMMISSION	BSL REMITTANCE - DEC 17	1148.84
EFT23507	08/01/2018 GULL GINGIN	STUDENT COUNCIL LUNCH	151.00
EFT23508	08/01/2018 VERENA (FRAN) HAENNI	KIOSK SUPPLIES REIMBURSEMENT	164.99
EFT23509	08/01/2018 GRO-TURF PTY LTD	TURF MAINTENANCE - NOV 17	35609.99
EFT23510	08/01/2018 LIMESTONE PARK EARTHMOVING	FIREBREAKS BY PRIVATE CONTRACTOR	1193.50
EFT23511	08/01/2018 LANCELIN IGA XPRESS	LANCELIN IGA ACCOUNT - NOV 17	91.72
EFT23512	08/01/2018 RSA SIGNS PTY LTD	SIGNS - VARIOUS	4877.40
EFT23513	08/01/2018 FULTON HOGAN	BULKA BAGS SUMMER EZY PATCH	5632.00
EFT23514	08/01/2018 STEVEN JOHN LUSK	RATES REFUND	1453.58
EFT23515	08/01/2018 KLEENHEAT GAS PTY LTD	GAS - VARIOUS LOCATIONS	9732.65
EFT23516	08/01/2018 LANCELIN SANDS	BREAK MOORE RIVER SAND BAR	440.00
EFT23517	08/01/2018 JE MIEL T/AS GINGIN IGA EXPRESS	GINGIN IGA ACCOUNT - DEC 17	810.40
EFT23518	08/01/2018 MARIE THERESA CRANE	REIMBURSEMENT XMAS CRAFT DAY	26.60
EFT23519	08/01/2018 ADS AUTOMATION PTY LTD	GUILDERTON CARAVAN PARK ON SITE	4523.75
EFT23520	08/01/2018 GINGIN FLORIST	STAFF CHRISTMAS PARTY 2017	400.00
EFT23521	08/01/2018 ADLER BUSINESS GIFTS PTY LTD	PRO STADIUM TOTE W/ZIPPER AND LOGO	1360.15
EFT23522	08/01/2018 GLORIA HYNNE	REIMBURSEMENT FOR XMAS CRAFT	123.60
EFT23523	08/01/2018 GULL GINGIN	CATERING	170.00
EFT23524	08/01/2018 FV & M SMIT TRUST ACCOUNT	DOCTOR'S SUPPORT	892.43
EFT23526	08/01/2018 DEPARTMENT OF TRANSPORT	VEHICLE SEARCH FEES	154.10
EFT23527	08/01/2018 JB HI-FI	RANGER'S MOBILE PHONES.	4383.00
EFT23528	08/01/2018 MARBRET INTERNATIONAL PTY LTD	LINEN-GUILDERTON CARAVAN PARK	2537.81
EFT23529	08/01/2018 GINGIN PANEL AND PAINT	COLLECT AND DISPOSE OF VEHICLE	275.00
EFT23530	10/01/2018 CAROLA CRANSWICK	CATERING FOR SENIORS DAY	1000.00
EFT23531	11/01/2018 GEOFFRY LIDDELOW	MANAGEMENT CONTRACT FOR GU C/PARK	41250.00
EFT23532	11/01/2018 VCM	COFFEE MACHINE RENTAL	55.00
EFT23533	11/01/2018 CELLARBRATIONS GINGIN	REFRESHMENTS	125.97
EFT23534	11/01/2018 GFAB	MODIFICATIONS TO JCB BUCKET	1270.50
EFT23536	11/01/2018 MOORE DEMO & CIVIL	REPAIR DAMAGED SECTION OF ENTRY LP T	1465.00
EFT23537	11/01/2018 NORTHERN VALLEY FRUIT POPS	POPSICLES	100.00
EFT23538	11/01/2018 BUNNINGS BUILDINGS SUPPLIES	MAINTENANCE ITEMS	1311.82
EFT23539	11/01/2018 PAYWISE	VEHICLE LEASE	772.92
EFT23540	11/01/2018 CLAW ENVIRONMENTAL	REMOVAL AND RECYCLING OF OLD OIL	1814.29
EFT23541	11/01/2018 HITACHI	SERVICE FOR GG004	1058.39
EFT23542	11/01/2018 VCM	COFFEE MACHINE RENTAL	55.00
EFT23543	11/01/2018 CELLARBRATIONS GINGIN	REFRESHMENTS	83.00
EFT23544	11/01/2018 DIELECTRIC SECURITY SYSTEMS	SECURITY MONITORING	302.50
EFT23545	11/01/2018 MOORE RIVER SKIP BINS	RECYCLING	660.00
EFT23546	11/01/2018 GINGIN ELECTRICAL PTY LTD	SEARCH FOR ELECTRICAL FAULTS SHIRE O	209.00
EFT23547	11/01/2018 JOANNE TONNA GRAPHIC DESIGN	ADVERTISING	240.00
EFT23548	11/01/2018 EXPERIENCE LA HOLIDAY PARK	DEBTOR PAYMENTS	17875.63
EFT23549	11/01/2018 COURIER AUSTRALIA	FREIGHT	85.74
EFT23550	11/01/2018 LANCELIN SANDS	PUMP OUT SEPTICS AT BACK BEACH, LA	2700.00
EFT23551	11/01/2018 RSPCA WA (INC.)	PAYROLL DEDUCTIONS	10.00
EFT23552	11/01/2018 LGRCEU (WA DIVISION)	PAYROLL DEDUCTIONS	82.00
EFT23553	11/01/2018 HIF	PAYROLL DEDUCTIONS	157.55
EFT23554	11/01/2018 SOCIAL CLUB	PAYROLL DEDUCTIONS	1334.00
EFT23555	12/01/2018 JOHN WILLIAM ELGIN	ERROR IN DOG FEE CHARGE	150.00
EFT23556	12/01/2018 COVS PARTS PTY LTD	PADS AND BREAK SHOES	188.51
EFT23557	12/01/2018 LANCELIN MECHANICAL	TYRE REPAIR	35.00
EFT23558	12/01/2018 TANYA MAY STOKES	YOGA SESSIONS FOR PARTY IN THE PARK	150.00
EFT23559	12/01/2018 JOSHUA STEVENS	REIMBURSEMENT FOR FUEL	127.16
EFT23560	12/01/2018 COURIER AUSTRALIA	FREIGHT	91.22
EFT23561	12/01/2018 BOC	GAS BOTTLE HIRE	114.57
EFT23562	12/01/2018 GUILDERTON COMM ASSOC INC (GCA)	GU COMM ASSOC - 50% PUBLIC LIABILITY	488.00
EFT23563	12/01/2018 GINGIN FUEL AND TYRES	REPLACEMENT OF ONE STEER TYRE	1154.91
EFT23564	12/01/2018 LANCELIN SANDS	ABLUTIONS FOR PARTY IN THE PARK	577.50
EFT23565	12/01/2018 DFES	ESL DECEMBER 2017	19055.06
EFT23566	12/01/2018 STEWART AND HEATON	PPE	1152.76
EFT23567	12/01/2018 GR THOMSON TRUCK HIRE	TRUCK HIRE	12722.88

EFT23568	12/01/2018	WURTH AUSTRALIA PTY LTD	WING REPAIR WASHER	7.08
EFT23569	12/01/2018	TRUCK CENTRE WA PTY LTD	FILTERS FOR SERVICE	801.44
EFT23570	12/01/2018	AMPAC DEBT RECOVERY WA PTY LTD	DEBT RECOVERY	39845.99
EFT23571	12/01/2018	DOCU-SHRED	COLLECT SHREDDING MATERIAL IN BINS	731.50
EFT23572	12/01/2018	TWENTY FEET BEAT	MUSIC IN THE PARK - 27/01/2018	2000.00
EFT23573	12/01/2018	JOANNE TONNA GRAPHIC DESIGN	CORPORATE BUSINESS PLAN 2017-2021	720.00
EFT23574	12/01/2018	JODIE MORTADZA	CATERING	259.07
EFT23575	12/01/2018	LANDGATE	VALUATIONS	359.78
EFT23576	17/01/2018	AUSTRALIAN TAXATION OFFICE	DECEMBER 2017 BAS - FBT INSTALMENT	46376.00
EFT23577	18/01/2018	VOLUNTEERING WESTERN AUSTRALIA	ANNUAL SUBSCRIPTION	290.00
EFT23578	18/01/2018	ANTHONY PAUL MONTELEONE	RATES REFUND	1193.00
EFT23579	18/01/2018	COMMUNITY NEWSPAPER GROUP	ADVERTISING	2168.87
EFT23580	18/01/2018	MCLEODS	EASEMENT - LOT 201 DEE SWAMP ROAD	256.98
EFT23581	18/01/2018	SPORTS SURFACES	REPAIRS TO CENTRE CIRCLES GG COURTS	3267.00
EFT23582	18/01/2018	WALGA	TRAINING MODULE " - CR RULE"	390.00
EFT23583	18/01/2018	WRIGHT EXPRESS	DECEMBER ACCOUNT	1943.71
EFT23584	18/01/2018	AVON WHEATBELT DEVELOP COMM	AGRI-INDUSTRY PROCESS HUB - STAGE 1	27500.00
EFT23585	18/01/2018	FV & M SMIT TRUST ACCOUNT	DOCTOR'S SUPPORT	2444.74
EFT23586	18/01/2018	VERENA (FRAN) HAENNI	2 X GAZEBO'S FOR POOL	359.90
EFT23587	18/01/2018	CENTRAL EARTHMOVING COMPANY	VERGE CLEARING AND MULCHING	96591.66
EFT23588	18/01/2018	ART'SEDGE	MUSEUM FRAMING NEWSPAPER	440.00
EFT23589	18/01/2018	ST JOHN AMBULANCE WA	FIRST AID COURSE - B FOULKES-TAYLOR	160.00
EFT23590	18/01/2018	SAVANAH SOLOMON	BUSKING FOR MARKET DAY	50.00
EFT23591	18/01/2018	PLUMB IT RIGHT PTY LTD	PUMP REPAIRS - REDFIELD PARK FSHED	1375.97
EFT23606	19/01/2018	AUSTRALASIAN PERFORM RIGHT ASS	EVENTS	456.00
EFT23607	19/01/2018	COO-EE COURIERS	FREIGHT	700.92
EFT23608	19/01/2018	HERSEY JR & A	TAG TEST FOR WORKSHOP	350.88
EFT23609	19/01/2018	WALGA	TRAINING COURSE -C GROVES	1354.00
EFT23610	19/01/2018	OFFICEMAX AUSTRALIA LTD	STATIONERY	142.58
EFT23611	19/01/2018	GORDON HARVEY GOW	PRESCRIPTION SAFETY GLASSES G GOW	200.00
EFT23612	19/01/2018	GINGIN MECHANICAL SERVICES	20L DIESEL, 20L SYN UNIGEAR AND WHITE S	378.35
EFT23613	19/01/2018	LANCELIN IGA XPRESS	DECEMBER 2017 ACCOUNT	117.44
EFT23614	19/01/2018	DATA#3	THREE YEARS RENEWAL COVERAGE	2000.54
EFT23615	19/01/2018	AMPAC DEBT RECOVERY WA PTY LTD	DEBT COLLECTION	88.00
EFT23616	19/01/2018	NORTHERN VALLEY NEWS	ADVERTISING	800.00
EFT23617	19/01/2018	COVS PARTS PTY LTD	FILTERS FOR GG11866 SERVICE	268.44
EFT23618	19/01/2018	EASTERN HILLS SAWS & MOWERS	NEW CHAINSAW FOR LANCELIN	1079.00
EFT23619	19/01/2018	AUSTRALIA POST	POSTAGE	1950.00
EFT23620	19/01/2018	WOODRIDGE COMMUNITY ASSOCIATION	CLEANING ABLUTION	125.00
EFT23621	19/01/2018	FUEL DISTRIBUTORS OF WA PTY LTD	DIESEL	13805.65
EFT23622	19/01/2018	PLANNING INSTITUTE AUSTRALIA	L EDWARDS - REG PLANNER ENROLMENT	300.00
EFT23623	19/01/2018	DEP OF PRIMARY INDUSTRIES	STABLE FLY SYMPOSIUM SUPPORT	1100.00
EFT23624	19/01/2018	HOPKINS J & K	MEDIUM BLACK RAPID RISER	329.00
EFT23625	19/01/2018	INDEPENDENT VALUERS OF WA	GUILDERTON CARAVAN PARK VALUATION	5390.00
EFT23626	19/01/2018	DUDLEY CHEMICALS PTY LTD	CLEANING PRODUCTS	4187.81
EFT23627	19/01/2018	TROY'S PLUMBING PTY LTD	INSTALL NEW SOAKWELL	379.50
EFT23628	19/01/2018	MOORE STEPHENS	FBT WORKSHOP KARINA LEONHARDT	660.00
EFT23629	19/01/2018	IRON MOUNTAIN AUSTRALIA GROUP	RECORD RETENTION	214.71
EFT23630	19/01/2018	DANIEL'S PRINTING CRAFTSMEN	CORPORATE BUSINESS PLAN X 30	605.00
EFT23631	19/01/2018	GINGIN FUEL AND TYRES	TYRES	997.00
EFT23632	19/01/2018	IT VISION AUSTRALIA PTY LTD	FEE FOR CPM HOSTING	440.00
EFT23633	19/01/2018	WACKER NEUSON PTY LTD	NEW PARTS FOR SMALL WACKER	223.24
EFT23634	22/01/2018	VCM	COFFEE/RENTAL MACHINE	55.00
EFT23635	22/01/2018	WATERLOGIC AUSTRALIA PTY LTD	SERVICING OF WATER COOLERS	133.10
EFT23636	22/01/2018	COMMERCIAL AIR SOLUTIONS (CAS)	SUPPLY AND FIT NEW DUMP VALVE	1287.00
EFT23637	22/01/2018	AVON WASTE	WASTE COLLECTION	53035.60
EFT23638	22/01/2018	COASTLINE CLEANING SERVICES	CLEANING OF ABLUTION BLOCKS	5236.00
EFT23639	22/01/2018	LANCELIN GULL ROADHOUSE	FUEL	512.94
EFT23640	22/01/2018	ECOWATER SERVICES	BIO MAX SERVICE	529.10
EFT23641	22/01/2018	SHIELDS POWER CLEAN	CLEANING HALL AND BUS	900.00
EFT23642	22/01/2018	KEVIN VINE	CLEAN ABLUTIONS	6622.39
EFT23643	22/01/2018	LANCELIN TRADE/RURAL SUPPLIES	ACCOUNT DECEMBER 2017	7369.80
EFT23644	22/01/2018	MOORE RIVER ROADHOUSE	ACCOUNT DECEMBER 2017	233.28
EFT23645	23/01/2018	VCM	COFFEE SUPPLY	560.00
EFT23646	23/01/2018	MOORE RIVER ELECTRICAL	CIRCUIT BREAKER HOT WATER SYSTEM	132.00
EFT23647	23/01/2018	CHITTERING SEPTIC SERVICE	REMOVE SEPTIC WASTE	80.00
EFT23648	23/01/2018	THREE CHILLIES TRAIL DESIGN	SKATE AND BMX PARK REBUILD	37669.50
EFT23649	23/01/2018	TRACY HAGAN	WORK BOOTS	115.00
EFT23650	23/01/2018	NATHAN MICALLEF	REIMBURSEMENT FOR GLASSES	199.00
EFT23651	23/01/2018	WA SHED COMMERCIAL PTY LTD	SUPPLY AND ERECT SHED	22206.80
EFT23652	23/01/2018	PDF FOOD SERVICES PTY LTD	POOL KIOSK SUPPLIES	4675.85
EFT23653	23/01/2018	NORTHERN VALLEY FRUIT POPS	POPSICLES	75.00
EFT23654	23/01/2018	EXPERIENCE LA HOLIDAY PARK	PAYMENTS MADE TO SHIRE LA C/PARK	1793.34
EFT23655	24/01/2018	HITACHI	PGG001 750 HR SERVICE KIT	945.56
EFT23656	24/01/2018	ASTRO ALLOYS (AUST) PTY LTD	GG019/GG012 WEAR PLATES FOR SKIDS	499.20
EFT23657	24/01/2018	STEWART AND HEATON CLOTHING	T540 1 X TROUSERS SIZE 97S	89.13
EFT23658	24/01/2018	GRO-TURF PTY LTD	TURF MAINTENANCE - DECEMBER 2017	33904.99
EFT23659	24/01/2018	GOLDFIELDS DEANS AUTOGLASS	PGG048 NEW WINDSCREEN	605.00
EFT23660	24/01/2018	WACKER NEUSON PTY LTD	BELT GUARD GG048	56.72
EFT23661	24/01/2018	PUBLIC SECTOR TRAINING SOLUTIONS	INDEPENDENT REVIEW AND ADVICE	9707.50
EFT23662	24/01/2018	NORTHERN VALLEY FRUIT POPS	POPSICLES	50.00
EFT23663	24/01/2018	BOC	43070	110.86

EFT23664	24/01/2018	GINGIN FUEL AND TYRES	TYRES	2546.60
EFT23665	24/01/2018	COS	STATIONERY	114.88
EFT23666	24/01/2018	CELLARBRATIONS GINGIN	REFRESHMENTS	159.00
EFT23667	24/01/2018	LOCAL GOV PROFESSIONALS WA	FINANCE PROF CONFERENCE Z EDWARDS	1440.00
EFT23668	24/01/2018	MOORE RIVER ELECTRICAL SERVICES	PHASE OUT SEABIRD FIRE SHED	165.00
EFT23669	24/01/2018	OFFICEMAX AUSTRALIA LTD	STATIONERY	224.17
EFT23670	24/01/2018	DATA#3	SOPHOS FIREWALL LICENSE	3704.49
EFT23671	24/01/2018	DEPARTMENT OF TRANSPORT	VEHICLE SEARCH FEES	83.75
EFT23672	24/01/2018	SEASTARZ SWIM SCHOOL	GG POOL SWIMMING LESSONS	4431.20
EFT23673	24/01/2018	IRON MOUNTAIN AUSTRALIA GROUP	MONTHLY STORAGE CHARGES	229.04
EFT23674	24/01/2018	JOSHUA STEVENS	CIVIL ENGIN STUDENT TRAVEL EXPENSES	80.70
EFT23675	24/01/2018	LEDGE POINT COUNTRY CLUB INC	CATERING	280.50
EFT23676	25/01/2018	PAYWISE	VEHICLE LEASE	772.92
EFT23677	25/01/2018	RSPCA WA (INC.)	PAYROLL DEDUCTIONS	10.00
EFT23678	25/01/2018	LGRCEU (WA DIVISION)	PAYROLL DEDUCTIONS	82.00
EFT23679	25/01/2018	HIF	PAYROLL DEDUCTIONS	157.55
EFT23680	25/01/2018	SOCIAL CLUB	PAYROLL DEDUCTIONS	1274.00
EFT23681	25/01/2018	SIGMA CHEMICALS	CHEMICALS	142.23
EFT23682	25/01/2018	FV & M SMIT TRUST ACCOUNT	SUPPLIES AND MATERIALS	2701.71
EFT23684	25/01/2018	LIMESTONE PARK EARTHMOVING	FIREBREAK INSTALLATION	4357.50
EFT23685	25/01/2018	M.R. MULCHING	FIREBREAK INSTALLATION	660.00
EFT23686	25/01/2018	THE NATIONAL TRUST OF WA	GINGIN RAILWAY STATION RENT	1405.12
EFT23687	30/01/2018	ABCO WATER SYSTEMS	GU C/PARK EFFLUENT DISPOSAL SYSTEM	35696.10
EFT23688	30/01/2018	VORGE PTY LTD	GOGGLES	297.00
EFT23689	31/01/2018	GINGIN TRADING	BALANCE OF ACCOUNT	4692.11
EFT23690	31/01/2018	PRECISION AIR CONDITIONING (WA)	SUPPLY AND INSTALL AIR CON	4730.00
EFT23691	31/01/2018	FV & M SMIT TRUST ACCOUNT	DOCTOR'S SUPPORT	3049.51
EFT23692	31/01/2018	TRISLEYS HYDRAULIC SERVICES	PUMP INSPECTION(OFF SITE)	554.40
EFT23693	31/01/2018	COVS PARTS PTY LTD	CARGO NETS	544.84
EFT23694	31/01/2018	MOORE STEPHENS	INTERIM AUDIT FEES 16/17	13623.79
EFT23695	31/01/2018	SOLARGAIN PV PTY LTD	INSTALL SOLAR PANEL SYSTEM	20344.50
EFT23696	31/01/2018	PDF FOOD SERVICES PTY LTD	POOL KIOSK SUPPLIES	473.35
EFT23697	31/01/2018	NORTHERN VALLEY FRUIT POPS	POPSICLES	75.00
EFT23698	31/01/2018	GINGIN FUEL AND TYRES	TYRES	888.00
EFT23699	31/01/2018	VCM	COFFEE/RENTAL MACHINE	55.00
EFT23700	31/01/2018	QUALITY TRAFFIC MANAGEMENT	TRAFFIC CONTROL	57590.23
EFT23701	31/01/2018	JTAGZ PTY LTD	DOG TAGS	162.80
EFT23702	31/01/2018	LANCELIN APPLIANCE SERVICES	GUILDERTON CARAVAN PARK REPAIRS	2075.00
EFT23703	31/01/2018	HEMPFIELD SMALL MOTORS	RECOIL ASSEY	54.80
EFT23704	31/01/2018	RNK SALES PTY LTD	PURCHASE OF NEW KANGA DT725	57196.15
EFT23705	31/01/2018	COVS PARTS PTY LTD	AIR FILTERS	72.01
EFT23706	31/01/2018	GINGIN FUEL AND TYRES	PGG070 TWO NEW FRONT TYRES	522.00
EFT23707	31/01/2018	GINGIN GOLF CLUB	GRANT FOR ROAD SEALING	3000.00
EFT23708	31/01/2018	SB PROGRESS/SPORTING ASSOC	TOILET CLEANING OF SEABIRD HALL	360.00
EFT23709	31/01/2018	STEWART AND HEATON	PPE	140.29
EFT23710	31/01/2018	MCLEODS	POST-ELECTION INDUCTION SESSION	5503.30
EFT23711	31/01/2018	GINGIN DISTRICT CRC	ADVERTISTING - 12 MONTHS	1000.00
EFT23712	31/01/2018	WALGA	WALGA TRAINING FOR A MARTINOVICH	1030.00
EFT23713	31/01/2018	MOORE RIVER ELECTRICAL SERVICES	ELECTRICAL REPAIRS	275.00
EFT23714	31/01/2018	RSA SIGNS PTY LTD	SIGNS	2644.95
EFT23715	31/01/2018	JOANNE TONNA GRAPHIC DESIGN	ADVERTISEMENT	210.00
EFT23716	31/01/2018	GINGIN FUEL AND TYRES	TYRE FIT AND BALANCE	135.16

EFT TOTAL**935,416.34****CHEQUES**

115417	08/01/2018	JULIE ORRELL	REFUND CANCEL BOOKING GU C PARK	110.00
115418	08/01/2018	MICHELLE TAN	REFUND CANCEL BOOKING GU C PARK	175.00
115419	08/01/2018	JENNY WATSON	REFUND CANCEL BOOKING GU C PARK	103.00
115420	08/01/2018	JANELLE COSTON	REFUND CANCEL BOOKING GU C PARK	85.00
115421	08/01/2018	TERRY RIORDIN	REFUND CANCEL BOOKING GU C PARK	87.00
115422	11/01/2018	CONSTRUCTION TRAINING FUND	LEVY	3612.33
115423	11/01/2018	TELSTRA	FIRE BRIGADE PHONE AND INTERNET	322.05
115424	11/01/2018	SHIRE OF GINGIN	PE 9/1/2018	2170.00
115425	12/01/2018	BEACHSANDS LEDGE POINT	FUEL	22.79
115426	12/01/2018	PIANO ACCORDIAN ALLEGRIA	BUSKER FOR PARTY IN THE PARK	50.00
115427	12/01/2018	SYNERGY	LP GOLF CLUB	1270.40
115430	16/01/2018	DAWN FRANCES LA PUMA	RATES REFUND	667.50
115431	16/01/2018	JESSICA RORBACH	RATES REFUND	55.50
115432	16/01/2018	JACQUELINE GRAY	RATES REFUND	40.00
115433	16/01/2018	TUI TRENT	RATES REFUND	124.00
115436	18/01/2018	SYNERGY	GU CARAVAN PARK	8034.45
115437	19/01/2018	PASTORAL AREA YANCHEP	RATES REFUND	680.91
115438	19/01/2018	SYNERGY	LP GOLF CLUB	1270.40
115439	19/01/2018	ANNA-MARIE ISABELLA FROELICH	RATES REFUND	583.55
115440	19/01/2018	LINDA WYLIE	RATES REFUND	108.34
115441	24/01/2018	GREENWELL W & J	TOASTER FOR WORKSHOP	92.22
115443	25/01/2018	GREENWELL W & J	EXHAUST FAN	34.00
115444	25/01/2018	SHIRE OF GINGIN	PAY ENDING 23/1/2018	2170.00
115445	25/01/2018	LEONARD WALTER CARVELL	RATES REFUND	667.08

115446	25/01/2018	LEODUVER VICEDO	REFUND FOR SEASTARZ SWIM LESSONS	210.70
115447	25/01/2018	CHELSEA SHEPHERD	REFUND FOR SEASTARZ SWIM LESSONS	95.35
115448	25/01/2018	SYNERGY	LEDGE POINT GOLF CLUB	868.40
115449	25/01/2018	WATER CORPORATION	ACCOUNT FOR RAILWAY STATION	162.59
115450	30/01/2018	DEP OF WATER/ENVIRONMENTAL REG	CLEARANCE PERMIT/ WD EQUES CENTRE	50.00
115451	31/01/2018	KEVIN BENNETT	BUSKER 2 DAYS FOR PARTY IN THE PARK	100.00
115452	31/01/2018	BENJAMIN WEIDE	RATES REFUND	50.50
115453	31/01/2018	BENJAMIN RICHARD TEMBY	RATES REFUND	1655.11
115454	31/01/2018	AARON PETER BANKS	RATES REFUND	121.63

CHEQUES TOTAL

25,849.80

DIRECT DEBIT

DD23624.1	02/01/2018	SYNERGY	ELECTRICITY	131.00
DD23631.1	04/01/2018	TELSTRA	TELEPHONE - GUILBERTON CARAVAN PARK	596.76
DD23638.1	05/01/2018	HELEN MARIE SAMPSON	MANAGE - GINGIN REFUSE SITE	2411.60
DD23658.1	09/01/2018	T-QUIP	STREET SWEEPER LEASE JAN 2018	3771.83
DD23671.1	10/01/2018	TELSTRA	TELEPHONE - ADMIN	2827.67
DD23677.1	02/01/2018	CREDIT CARD - CESM	CARD FEE FOR OCTOBER 2017	12.15
DD23679.1	02/01/2018	CREDIT CARD - EMA	FIRST AID COURSE - L SOLOMON - S MOIR	117.72
DD23681.1	03/01/2018	CREDIT CARD - EMA	GOGGLES, CAPS	1113.90
DD23684.1	09/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	2984.90
DD23684.2	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	84.53
DD23684.3	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	202.35
DD23684.4	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	200.75
DD23684.5	09/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	685.58
DD23684.6	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	195.05
DD23684.7	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	220.21
DD23684.8	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	195.33
DD23684.9	09/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	706.92
DD23697.1	12/01/2018	TELSTRA	TELEPHONE - (TIM)	72.80
DD23699.1	12/01/2018	TELSTRA	TELEPHONE	1051.91
DD23704.1	12/01/2018	SYNERGY	ELECTRICITY - WOODRIDGE HALL	5.69
DD23706.1	16/01/2018	SYNERGY	ELECTRICITY - WOODRIDGE HALL	2145.81
DD23734.1	19/01/2018	SYNERGY	ELECTRICITY - GINGIN DEPOT	1433.15
DD23736.1	19/01/2018	SYNERGY	ELECTRICITY	518.95
DD23738.1	19/01/2018	SYNERGY	ELECTRICITY - CEO RESIDENCE	385.05
DD23740.1	19/01/2018	SYNERGY	ELECTRICITY - GRANVILLE PARK	213.85
DD23742.1	19/01/2018	SYNERGY	CHURCH ST, GINGIN	174.70
DD23744.1	19/01/2018	SYNERGY	ELECTRICITY - TELECOM DEPOT	130.00
DD23746.1	19/01/2018	SYNERGY	ELECTRICITY - AGED PERSONS UNITS	75.30
DD23748.1	19/01/2018	SYNERGY	ELECTRICITY - PLAYGROUP BLG	72.65
DD23750.1	19/01/2018	SYNERGY	ELECTRICITY - 5 WELD ST, GINGIN	66.05
DD23752.1	19/01/2018	SYNERGY	ELECTRICITY - CONSTABLE ST, GINGIN	54.35
DD23754.1	19/01/2018	HELEN MARIE SAMPSON	MANAGE - GINGIN REFUSE SITE	2411.60
DD23764.1	22/01/2018	SYNERGY	ELECTRICITY - COCKRAM RD, GINGIN	251.80
DD23766.1	22/01/2018	SYNERGY	ELECTRICITY - LOT 501 HONEYCOMBE RD, (71.65
DD23773.1	23/01/2018	SENSIS PTY LTD	ADVERTISING YELLOW PAGES	83.03
DD23775.1	23/01/2018	TELSTRA	TELEPHONE	565.69
DD23777.1	23/01/2018	SYNERGY	ELECTRICITY	11307.35
DD23779.1	23/01/2018	SYNERGY	ELECTRICITY - ROE ST, GINGIN	1229.55
DD23794.1	24/01/2018	WATER CORPORATION	WATER - PIONEER PARK, LANCELIN	94.69
DD23796.1	24/01/2018	TELSTRA	TELEPHONE	25.95
DD23798.1	23/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	2556.45
DD23798.2	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	190.18
DD23798.3	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	202.35
DD23798.4	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	200.75
DD23798.5	23/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	685.58
DD23798.6	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	329.17
DD23798.7	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	64.41
DD23798.8	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	217.03
DD23798.9	23/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	708.28
DD23799.1	24/01/2018	TELSTRA		-25.95
DD23802.1	24/01/2018	TELSTRA	TELEPHONE - GG FIRE BRIGADE	25.95
DD23804.1	24/01/2018	SYNERGY	FROGMOORE DEPOT	519.60
DD23813.1	29/01/2018	WA TREASURY CORPORATION	LOAN REPAYMENT	12159.77
DD23815.1	29/01/2018	SYNERGY	ELECTRICITY	514.60
DD23817.1	29/01/2018	SYNERGY	ELECTRICITY	359.85
DD23819.1	29/01/2018	SYNERGY	ELECTRICITY	324.85
DD23821.1	29/01/2018	SYNERGY	ELECTRICITY	918.85
DD23823.1	29/01/2018	SYNERGY	ELECTRICITY	304.50
DD23835.1	30/01/2018	WA TREASURY CORPORATION	LOAN REPAYMENT	18841.02
DD23838.1	30/01/2018	SYNERGY	ELECTRICITY	272.75
DD23840.1	30/01/2018	SYNERGY	ELECTRICITY	180.40
DD23845.1	30/01/2018	SYNERGY	ELECTRICITY	141.60
DD23849.1	14/01/2018	CREDIT CARD - CEO	PREPARE TENDER DOCS - O EDWARDS	921.80
DD23851.1	14/01/2018	CREDIT CARD - EMCCS	LOCAL RECOVERY COORDINATOR TRAIN	558.03
DD23684.10	09/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	866.96
DD23684.11	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	211.22
DD23684.12	09/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	18567.58
DD23684.13	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	210.59
DD23684.14	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	452.34

DD23684.15	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	350.59
DD23684.16	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	629.22
DD23684.17	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	982.12
DD23684.18	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	237.12
DD23684.19	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	114.23
DD23684.20	09/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	163.32
DD23798.10	23/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	866.97
DD23798.11	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	211.22
DD23798.12	23/01/2018	CLICKSUPER	PAYROLL DEDUCTIONS	18815.08
DD23798.13	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	210.59
DD23798.14	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	452.36
DD23798.15	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	350.59
DD23798.16	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	629.24
DD23798.17	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	982.12
DD23798.18	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	207.48
DD23798.19	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	114.23
DD23798.20	23/01/2018	CLICKSUPER	SUPERANNUATION CONTRIBUTIONS	163.32

DIRECT DEPOSIT	125,860.13
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TOTAL MUNICIPAL	<u>1,087,126.27</u>
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TRUST

3232	22/01/2018	SHARON SMITH	SOCIAL CLUB PAYOUT	300.00
3233	22/01/2018	LEE-ANNE BURT	SOCIAL CLUB PAYOUT	250.00

<u>550.00</u>

BANK STATEMENT TOTALS

STATEMENT DEBITS	BANK FEES AND CHARGES	3900.70
PAYS	WAGES AND SALARIES	252,226.26
ELECTRONIC PAYMENTS	POLICE LICENCING	71,107.30
	LA OFFICE RENT	643.38
	GG DOCTORS RESIDENCE	0.00
	FLEXIRENT	212.14
	LA DOCTORS RESIDENCE	1,600.00
	LA DOCTORS VEHICLE	623.52

<u>326,412.60</u>

TOTAL EXPENDITURE

<u>1,413,538.87</u>

CREDIT CARD BREAK-UP

JANUARY

BANK CHARGES	MONTHLY CARD FEE X 6	24.00
REFRESHMENTS/RECEPTIONS	TOOL BOX MTG 17/1, CEO MTG 24/1	233.00
TRAINING/CONFERENCE		
IT SUPPORT	MOBILE PHONE SCREEN PROTECTORS	30.00
WORKSHOP ITEMS	GG11866 BRAKE PADES, CHAINSAW PARTS	169.27
PARKING	CITY OF PERTH	18.35
POOL KIOSK	GOOGLES, KIOSK SUPPLIES, STATIONARY SUPPLIES	1,094.17
GUILDERTON CARAVAN PARK	C17 QUARTERLY SERVICE AND SUPPLIES	235.25
		<u>1,804.04</u>

AT THE TIME OF PRINTING THE
AGENDA THERE WERE NO CREDITORS
OUTSTANDING

CHIEF EXECUTIVE OFFICER

PRESIDENT

11.3. PLANNING AND DEVELOPMENT

11.3.1 INITIATE FOR PUBLIC CONSULTATION THE SHIRE OF GINGIN'S DRAFT COASTAL HAZARD RISK MANAGEMENT AND ADAPTATION PLAN (CHRMAP)

FILE: ENV/17
AUTHOR: KYLIE BACON – MANAGER STATUTORY PLANNING
REPORTING OFFICER: LISA EDWARDS – EXECUTIVE MANAGER PLANNING AND DEVELOPMENT
REPORT DATE: 20 FEBRUARY 2018
REFER: NIL

OFFICER INTEREST DECLARATION

Nil

PURPOSE

To consider initiating a public consultation process with respect to the Shire of Gingin's Draft Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).

BACKGROUND

State Planning Policy 2.6: State Coastal Planning Policy (SPP 2.6 or the Policy) requires local planning authorities to prepare for the impacts of coastal erosion and coastal inundation (temporary flooding of normally dry land). The Policy requires local government to show due regard for its policy when making or revising schemes and assessing new development. The Policy also requires that local governments, and other relevant planning authorities with coastal jurisdiction, prepare CHRMAPs in accordance with the Policy, policy guidelines and CHRMAP guidelines.

The Policy indicates a clear preference for relevant authorities to consider a strategy of Planned or Managed Retreat over coastal protection. Planned and managed retreat is aimed at accommodating the impacts of long term sea level rise (current projections of 0.9m by 2110), preserving public beach access and coastal ecosystems, and providing future decision makers with flexibility to change management approaches (unlike hard coastal protection).

In September 2017, the Western Australian Planning Commission released the draft *Planned and Managed Retreat Guidelines* (the Guidelines) to provide guidance as to how planned and managed retreat could be implemented under the existing State legislative and policy framework. The Guidelines recommend the use of voluntary or compulsory acquisition provisions provided for under the *Land Administration Act 1997* (WA) and *Planning and Development Act 2005* (WA).

In reality, this is unlikely to occur in the Shire of Gingin unless the State or Commonwealth Governments provide the majority of funding to acquire property. There is no obligation on Government to adopt a strategy that may invoke a requirement to compensate land owners for loss due to erosion. It is important to note that while the managed retreat option is recommended in this CHRMAP, its future implementation will need further investigation with respect to the implications for both Government and private stakeholders. It is also important to note that landowners who may be considering purchasing or developing land in designated hazard areas should not assume that any funds will be forthcoming to support future retreat.

COMMENT

Development of the Gingin Draft CHRMAP has followed the requirements of SPP 2.6 and supporting guideline documents. Previous work had highlighted three coastal townships within the Shire (Seabird, Ledge Point and Lancelin) as being at risk of coastal erosion and these areas form the focus for this CHRMAP. The coastal zones of each township were divided into management units (two at Seabird, four at Ledge Point and four at Lancelin) with similar asset types and exposure to coastal hazards. The risk and vulnerability assessment was applied to each management unit and results highlighted the most vulnerable management unit within each township, for which more detailed assessment of adaptation options were investigated.

A range of options for addressing the challenges of coastal erosion and its effects on the coastal zone over the next decade and century have been outlined. While it is natural that local communities would prefer to protect and preserve the current features of the coastal zone, the reality is that unless some new and innovative protection methods are developed, the costs of maintaining current features will likely become prohibitively expensive at some point in the future, given current sea level rise projections. The interim nature of protect options needs to be recognised across the community and adaption options developed and solutions optimised for social, environmental and economic (affordability) drivers.

In the absence of funding to acquire properties and implement a strategy of planned or managed retreat and resources to fund long term protection strategies, the Shire's Administration has worked with Cardno and the Department of Planning, Lands and Heritage to design an alternative interim planning framework. This planning framework accords with advice received from the Department of Planning, Lands and Heritage in 2016 and can be readily adapted to facilitate a strategy of planned or managed retreat as per the Guidelines if funding becomes available for acquisition in the future. This alternative framework utilises time limited planning consents to allow the continued development and use of land until coastal hazards materialise. This framework does not provide compensation to landholders if coastal hazards materialise.

The complex planning issues around setting the intent and establishing controls such Special Control Areas to either restrict development within currently developed areas and/or rezone currently undeveloped land to avoid future development are discussed for each of the management units within each township. A number of options was identified that aim to protect developed areas under imminent threat of a storm erosion event.

Appendix 1 contains the Shire of Gingin's Draft CHRMAP, being a plan for implementation of recommended adaptation options over the next decade to 2030, with a strategic view on the likely adjustments over the next century.

Community Consultation

In the event that Council agrees to proceed to public consultation with respect to the Draft CHRMAP, then advertising will be undertaken with a submission period of 30 days together with a public workshop in Lancelin. It is envisaged that a further report, including any public submissions, will be submitted to Council for consideration at the April 2018 Council meeting.

STATUTORY ENVIRONMENT

Planning and Development Act 2005

State Planning Policy 2.6: State Coastal Planning Policy

Shire of Gingin Local Planning Scheme No 9

POLICY IMPLICATIONS

Nil

BUDGET IMPLICATIONS

Funding for the Coastal Hazard Risk Management and Adaptation Plan has been allocated in the 2017/18 Budget.

STRATEGIC IMPLICATIONS

Shire of Gingin Strategic Community Plan 2017 – 2027

Focus Area	<i>Natural Environment</i>
Objective	<i>2. To develop the Shire's capacity to support the conservation of natural assets and undertake sustainable resource management.</i>
Outcome	<i>2.2 Sustainable Resource Management The Shire practises sustainable resource management within its operations and supports the community to do the same.</i>
Key Service Area	<i>Strategic Town Planning</i>
Priorities	<i>2.1.1 Coastal Planning and Adaptation.</i>

VOTING REQUIREMENTS – SIMPLE MAJORITY

RECOMMENDATION

It is recommended that Council

1. Agree to initiate public consultation process with respect to the Coastal Hazard Risk Management and Adaptation Plan as shown in Appendix 1;
2. Undertake Public consultation for a period of 30 days including a public workshop to be held at Lancelin; and

3. Require the CHRMAP to be returned to Council at its April Ordinary Council Meeting of April 2018 for final approval or otherwise having consideration for public submission.

RESOLUTION

Moved Councillor Elgin, seconded Councillor Rule that Council:

1. Agree to initiate a public consultation process with respect to the Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) as shown in Appendix 1;
2. Undertake public consultation for a period of 30 days including a public workshop to be held at Lancelin; and
3. Require the CHRMAP to be returned to Council at its Ordinary meeting on 17 April 2018 for final consideration in conjunction with any submissions received during the public consultation period.

The Executive Manager Operations – Construction left the Chamber at 3.19 pm and returned to the meeting at 3.20 pm.

The Executive Manager Planning and Development attended the meeting at 3.20 pm.

AMENDMENT

Moved Councillor Peczka, seconded Councillor Fewster that Council:

1. Agree to initiate a public consultation process with respect to the draft Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) as shown in Appendix 1;
2. Undertake public consultation for a period of 60 days including a public workshop to be held at Lancelin; and
3. Require the CHRMAP to be returned to Council at its Ordinary meeting on 19 June 2018 for final consideration in conjunction with any submissions received during the public consultation period.

For: Councillors Collard, Elgin, Fewster, Johnson and Peczka

Against: Councillors Court, Morton and Rule

**CARRIED
5-3**

REASON FOR AMENDMENT

Council was of the view that the Coastal Hazard Risk Management and Adaptation Plan should be marked “draft” and that the public consultation period should be extended to 60 days, therefore the document will not be returned to Council until the 19 June 2018 Council meeting.

SUBSTANTIVE MOTION

Moved Councillor Peczka, seconded Councillor Fewster that Council:

- 1. Agree to initiate a public consultation process with respect to the draft Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) as shown in Appendix 1;**
- 2. Undertake public consultation for a period of 60 days including a public workshop to be held at Lancelin; and**
- 3. Require the CHRMAP to be returned to Council at its Ordinary meeting on 19 June 2018 for final consideration in conjunction with any submissions received during the public consultation period.**

For: Councillors Collard, Elgin, Fewster, Johnson and Peczka
Against: Councillors Court, Morton and Rule

CARRIED
5-3

APPENDIX 1

Draft Coastal Hazard Risk Management and Adaption Plan

Shire of Gingin

59917806



Prepared for
Shire of Gingin

31 January 2018



Draft Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin

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Document Information

Prepared for	Shire of Gingin
Project Name	Shire of Gingin
File Reference	59917806_RevC_Gingin CHRMAP_Draft.docm
Job Reference	59917806
Date	31 January 2018

Document History

Version	Effective Date	Description of Revision	Prepared by:	Reviewed by:
V1	13-03-2017	Internal Draft	Jo Buckee	Daniel Strickland
V2	01-07-2017	Preliminary Draft	Jo Buckee	Daniel Strickland
V3	21-10-2017	Internal Draft	Daniel Strickland	David van Senden
V4	02-11-2017	Internal Draft	Daniel Strickland	David van Senden
Rev A	03-11-2017	Draft (Incomplete)	Daniel Strickland	David van Senden
Rev B	13-11-2017	Draft	Daniel Strickland	David van Senden
Rev C	31-01-2018	Draft	Daniel Strickland	David van Senden

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Executive Summary

The Shire of Gingin is preparing for the threats of climate change and sea level rise to the coastal settlements of Guilderton, Seabird, Ledge Point and Lancelin. Historically, the coastal towns were established to service fishing industry, agricultural activities; primarily sheep grazing within the hinterland, and are popular holiday destinations and retirement locations. This Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) has been prepared to provide a long term view of the potential future coastal erosion impacts to the townships of Seabird, Ledge Point and Lancelin and highlight possible strategies to adapt to the changing future oceanic and coastal conditions.

Development of the Gingin CHRMAP has followed the requirements of Western Australian State Planning Policy No. 2.6: State Coastal Planning Policy (SPP2.6) and supporting guideline documents. Previous work had highlighted the three coastal townships within the Shire as being at risk of coastal erosion and these areas form the focus for this CHRMAP. The coastal zones of each township were divided into management units (two at Seabird, four at Ledge Point and four at Lancelin) with similar asset types and exposure to coastal hazards. The risk and vulnerability assessment was applied to each management unit and results highlighted the most vulnerable management unit within each township, for which more detailed assessment of adaptation options were investigated.

A range of options for addressing the challenges of coastal erosion and its effects on the coastal zone over the next decade and century have been outlined. While it is natural that local communities would prefer to protect and preserve the current features of the coastal zone, the reality is that unless some new and innovative protection methods are developed, the costs of maintaining current features will likely become prohibitively expensive at some point in the future, given current sea level rise projections. The interim nature of protect options needs to be recognised across the community and, the adaption options developed and solutions optimised for social, environmental and economic (affordability) drivers.

The complex planning issues around setting the intent and establishing controls such Special Control Areas to either restrict development within currently developed areas and/or rezone currently undeveloped land to avoid future development are discussed for each of the management units within each township. A number of options was identified that aim to protect developed areas under imminent threat of a storm erosion event. An object of the state policy is to implement a beneficiary pays principle to apportion costs for protecting assets within defined coastal hazard areas. It is recommended that a comprehensive community and beach users engagement program be instigated to identify the key beneficiaries of any proposed protection option so the costs for implementation can be apportioned appropriately.

The recently released draft Planned and Managed Retreat Guidelines (WAPC, 2017) suggests the process for implementing future managed retreat may include compensation under provisions in the *Land Administration Act (1997)*. In reality, this is unlikely to occur in the Shire unless the State or Commonwealth Governments provide the majority of funding to acquire property. There is no obligation on Government to adopt a strategy that may invoke a requirement to compensate land owners for loss due to erosion. It is important to note that while the managed retreat option is recommended in this CHRMAP its future implementation will need further investigation of the implications for both Government and Private stakeholders. For Landowners who may be considering purchasing or developing lands in designated Hazard areas it is important to note that they should not assume any funds will be forthcoming to support future retreat.

A plan for implementation of recommended adaptation options over the next decade, to 2030 with a strategic view on the likely adjustments over the next century, to 2110 is outlined in the table below.

Draft Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin

Task Name	Start	Finish	Cost Estimate \$1,000s
Planning and Development Controls Review	1 Jan '18	28 Oct '20	\$155
Review Planning and Development Controls and Recommend Amendments as required	1 Mar '18	27 Sep '19	\$80
Amend current zone and SCA boundaries	1 May '18	31 Oct '18	\$15
Update SCA special provisions	29 Nov '18	30 Jan '19	\$20
Gingin LPS 9 Update and Endorsement by WAPC	17 Jan '20	30 Jun '20	\$40
Monitoring	1 May '18	14 May '29	\$410
Annual Beach Profile Surveys	4 May '18	14 May '29	\$300
Horizontal Shoreline Datum (Aerial Photo Analysis)	1 May '18	2 May '22	\$70
Post wave erosion Event (>2 yr ARI wave) Beach Profiles	11 Jan '19	17 Jan '19	\$30
Cyclone storm surge flooding Event	15 Mar '20	18 Mar '20	\$10
Specialist Investigations	26 Feb '18	28 Jul '25	\$415
Comprehensive investigation of each community and visitors be undertaken to identify beneficiaries of proposed protection areas	26 Feb '18	30 Nov '18	\$150
Investigate allowance for coastal foreshore reserve width to extend the 2110 Hazard line a sufficient distance to accommodate future relocation of foreshore assets	15 Mar '18	30 Jun '18	\$15
Assess Current and Future Sediment Budget in the Secondary Cell	1 Jul '18	30 Jun '21	\$80
Analysis of Flood, Storm Surge and Erosion event monitoring	14 May '20	5 Aug '20	\$40
Investigate Storm Surge and Coastal Processes Interactions to define triggers, set FFL, CHRMAP, Water Management Plans and Emergency Management Plan overlaps	25 Mar '25	28 Jul '25	\$50
Undertake economic analysis of options. Recommendations:	17 May '18	19 Sep '18	\$80
Operational	1 Feb '18	30 Nov '22	\$80
Establish Data Management and GIS system (time series, spot levels and remote sensing) relating to shoreline monitoring and general flooding in each Township to allow identification of trends over time, and Trigger assessment	1 Feb '18	26 Mar '19	\$50
Update Asset database to incorporate end of life date to facilitate future management of assets	1 Feb '18	26 Mar '19	\$20
Notifications - Potentially affected land owners by direct contact and property titles	1 Feb '18	30 Nov '22	\$10
CHRMAP Review and Update (2022)	1 Jan '19	30 Nov '22	\$210
Review Hazard line estimates (S1, S2, S3 and S4)	18 Feb '21	21 Apr '21	\$25
Review Risk Assessment and Future Pathway Options	29 Apr '21	30 Jun '21	\$40
Community and Stakeholder Consultation	1 May '21	31 Jan '22	\$50
Update CHRMAP	24 Jun '21	2 Mar '22	\$80
CHRMAP 2022 Endorsement by WAPC	7 Jul '22	30 Nov '22	\$15
CHRMAP Review and Update (2027)	8 Oct '26	8 Nov '28	\$210
Review Hazard line estimates (S1, S2, S3 and S4)	8 Oct '26	6 Jan '27	\$25
Review Risk Assessment and Future Pathway Options	1 Jun '27	2 Aug '27	\$40
Community and Stakeholder Consultation	1 Nov '26	31 Aug '27	\$50
Update CHRMAP	24 Jun '27	1 Mar '28	\$80
CHRMAP 2027 Endorsement by WAPC	6 Jul '28	8 Nov '28	\$15



Abbreviations and Acronyms

Abbreviation	Description
AEP	Annual Exceedance Probability
ARI	Average Recurrence Interval
AS	Australian Standard
CHRMAP	Coastal Hazard Risk Management and Adaption Plan
DoP	Department of Planning (now part of DoPLH)
DoPLH	Department of Planning, Lands and Heritage
DoT	WA Department of Transport
HSD	Horizontal Shoreline Datum (see SPP2.6)
IPCC	International Panel on Climate Change
LAA	Land Administration Act (1997)
LGA	Local Government Area
LIDAR	Light detection and ranging
LPS	Local Planning Strategy
MCA	Multi-criteria analysis
MRA	M P Rogers and Associates
MSL	Mean sea level
NACC	Northern Agricultural Catchments Council
SCA	Special Control Area
SLR	Sea Level Rise
SPP	State Planning Policy
SPP2.6	State Planning Policy No 2.6: State Coastal Planning Policy (2013)
TEC	Threatened Ecological Community
The Shire	Shire of Gingin
WA	Western Australia
WAPC	Western Australian Planning Commission
Wheatbelt PIF	<i>Wheatbelt Planning and Infrastructure Framework 2015</i>



Table of Contents

1	INTRODUCTION	1
1.1	Purpose	1
1.2	Overview of CHRMAP Process	2
1.3	Guiding Principles and Concepts	3
1.3.1	Equity	4
1.3.2	Coastal Foreshore Reservation	4
1.3.3	Rights and Responsibilities	5
1.3.4	Hazards and Risks	5
1.3.5	Assets and Values	5
1.3.6	Adaptive Capacity	6
1.3.7	Vulnerability	6
1.3.8	Temporal scales	6
1.3.9	Spatial scales	7
1.3.10	Adaptive management	7
1.4	Key Coastal Processes Concepts	8
1.5	Previous Assessments	10
1.6	CHRMAP Format	10
2	ESTABLISHING THE CONTEXT	12
2.1	Shire of Gingin	12
2.2	Seabird	14
2.3	Ledge Point	15
2.4	Lancelin	16
2.5	Stakeholder and Community Engagement	17
2.5.1	Objectives	17
2.5.2	Methods	18
2.6	Social and Environmental Values	18
2.7	Survey Results	19
2.7.1	Context	19
2.7.2	Coastal Values	20
2.7.3	Adaptation Options	20
2.8	Planning Framework	23
2.8.1	Strategic Plans	23
2.8.2	Statutory Plans & Policies	24
2.8.3	Local Structure Plans	24
2.8.4	Local Planning Policies	25
2.8.5	Local Planning Horizons	25
2.9	Risk Assessment Inputs	25
2.9.1	Hazards in each Management Unit	26
2.9.2	Assets	26
2.9.3	Values	27
3	COASTAL HAZARD RISK ASSESSMENT	28
3.1	Risk Assessment Framework	28
3.2	Risk Assessment Outcomes	30
3.2.1	SE1 - Seabird South	30
3.2.2	SE2 - Seabird North	31
3.2.3	LP1 - Ledge Point South of Township	31
3.2.4	LP2 - Ledge Point Township South	32



3.2.5	LP3 - Ledge Point Township North	33
3.2.6	LP4 - Ledge Point North of Township	33
3.2.7	LA1 - Lancelin South of Township	34
3.2.8	LA2 - Lancelin Township South	35
3.2.9	LA3 - Lancelin Township North	35
3.2.10	LA4 - Lancelin North of Township	36
3.3	Management Units for Priority Consideration of future Options	37
4	PLANNING CONTROLS	38
5	ADAPTATION OPTIONS	41
5.1	Adaptation Options Overview	41
5.2	Adaptation Options Assessment Process	44
5.3	Multi-criteria Analysis Results	47
5.3.1	Seabird South (SE1 and SE2)	47
5.3.2	Ledge Point	47
5.3.3	Lancelin	48
5.4	Adaptation Options – Seabird Township South (SE1)	48
5.4.1	Land Tenure and Seawall Management	49
5.4.2	Value of Assets at Risk	49
5.4.3	Remove and Relocate (MR2)	50
5.4.4	Groynes (PR2)	50
5.4.5	Seawall Maintenance (PR5)	51
5.5	Adaptation Options – Ledge Point Township South (LP2)	52
5.5.1	Value of Assets at Risk	52
5.5.2	Remove and Relocate (MR2)	53
5.5.3	Beach Nourishment (PR2)	53
5.5.4	Groynes (PR3)	54
5.5.5	Seawall (PR5)	55
5.6	Adaptation Options - Lancelin South of Township (LA1)	56
5.6.1	Value of Assets at Risk	57
5.6.2	Remove and Relocate (MR2)	58
5.6.3	Sand Nourishment	58
5.6.4	Accommodate (AC2)	59
5.6.5	Groynes (PR3)	59
5.6.6	Seawall (PR5)	59
6	IMPLEMENTATION	61
6.1	Funding and Equity	61
6.1.1	Seabird SE1	61
6.1.2	Ledge Point	62
6.1.3	Lancelin	62
6.2	Long Term Pathways and Short Term Implementation	62
6.3	Triggers	63
6.4	Seabird	64
6.4.1	Long Term Pathway	64
6.4.2	Short Term Implementation – Seabird Township South (SE1)	64
6.5	Ledge Point	65
6.5.1	Long Term Pathway	65
6.5.2	Short Term Implementation – Ledge Point Township South (LP2)	65
6.6	Lancelin	66
6.6.1	Long Term Pathway	66



6.6.2	Short Term Implementation – Lancelin South of Township (LA1)	66
6.7	Shire of Gingin Monitoring Plan	66
6.8	Shire of Gingin Implementation Plan (to 2030)	67
7	REFERENCES	70

Appendices

Appendix A	Hazard Maps by Management Units
Appendix B	Value Maps and list of Key Stakeholders
Appendix C	Asset Information for Each of the Management Units
Appendix D	Technical Note on Risk Assessment Methods
Appendix E	Risk Assessment Ratings and Results
Appendix F	Multi-Criteria Analysis Results
Appendix G	Multi-criteria Analysis Summary
Appendix H	Planning controls Discussion
Appendix I	Long Term Pathways

Tables

Table 2-1	CHRMAP location key attributes	12
Table 2-2	Indicative beach usage by management unit based on survey results	20
Table 2-3	Coastal processes erosion allowance for present day and predicted conditions	26
Table 3-1	Risk and adaptive capacity criteria used in the risk assessment	29
Table 5-1	Adaptation and Management Options (adapted from WAPC, 2014a)	42
Table 5-2	Overview of protection options considered in the CHRMAP	43
Table 5-3	Multi-criteria assessment and qualitative cost benefit input ratings and assessment outcome categories	46
Table 5-4	Summary of estimated value (2015 \$) of vulnerable built assets in the Seabird Township South management unit (from draft CHRMAP, Shire of Gingin, 2016b)	49
Table 5-5	Summary of estimated value (2015 \$) of vulnerable built assets in Ledge Point (from draft CHRMAP, Shire of Gingin, 2016b)	53
Table 5-6	Summary of estimated value (2015 \$) of vulnerable built assets in Lancelin (from draft CHRMAP, Shire of Gingin, 2016b)	57
Table 6-1	Recommendations and adaptation planning recommendations for SE1	64
Table 6-2	Recommendations and adaptation planning recommendations for LP2	65
Table 6-3	Recommendations and adaptation planning recommendations for LA1	66
Table 6-4	Tasks for Implementation up to 2030, schedule start and end dates and approximate costs	67

Figures

Figure 1-1	Recommended allowance for SLR in coastal planning for WA (source: DoT, 2010)	1
Figure 1-2	Influence of sea level rise on coastal erosion (source: CoastAdapt, 2017)	2
Figure 1-3	CHRMAP methodology flow chart (adapted from the WAPC, 2014a, CHRMAP Guidelines)	3
Figure 1-4	Coastal foreshore reserve – sandy coast example (source: WAPC 2013b)	5
Figure 1-5	Coastal planning timeframes used in this report	7



Figure 1-6	Conceptual timing for managed retreat in relation to predicted coastal hazards	8
Figure 1-7	Conceptual representation of key coastal erosion concepts; a) sediment transport processes and b) long term beach recession due to permanent sand loss (source: NSW Department of Land and Water Conservation, 2001)	9
Figure 1-8	Overview of the CHRMAP process and its relationship to the chapters in this document.	11
Figure 2-1	CHRMAP location map, townships and management unit boundaries	14
Figure 2-2	Photograph of seabird in 2016 following construction of the seawall (source: DoT)	15
Figure 2-3	Aerial view of Ledge Point in 2016 (source: DoT)	16
Figure 2-4	Aerial view of Lancelin in 2009 (source: Birdseye View Photography, http://www.birdseyeviewphotography.com.au/lancelin.shtml)	17
Figure 2-5	Ecosystem services approach to defining coastal values	19
Figure 2-6	Summary charts of online survey questionnaire responses	21
Figure 2-7	Responses to questions "what do you value about the coast" and "how strongly do you support the following erosion management approaches". Generally, more green indicates more agreement and more red indicates more disagreement.	22
Figure 2-8	Planning context overview	23
Figure 2-9	Conceptual relationship between key inputs to the coastal risk assessment process	25
Figure 3-1	Conceptual relationship between risk assessment elements	28
Figure 3-2	Photograph of the Seabird seawall during construction in the SE1 management unit (source, watoday.com.au)	30
Figure 3-3	Photograph of the northern section of the Seabird town site SE2 (source: DoT, 2016)	31
Figure 3-4	Photograph of the Ledge Point South of Township LP1 management unit (source: DoT, 2016)	32
Figure 3-5	Ledge Point Township South LP2 management unit (source: DoT, 2016)	32
Figure 3-6	Ledge Point Township North LP3 management unit (source: DoT, 2016)	33
Figure 3-7	Ledge Point North of Township LP4 management unit (source: DoT, 2016)	34
Figure 3-8	Lancelin South of Township LA1 management unit (source: DoT, 2016)	34
Figure 3-9	Lancelin Township South LA2 management unit (source: DoT, 2016)	35
Figure 3-10	Lancelin Township North LA3 management unit (source: DoT, 2016)	36
Figure 3-11	Lancelin North of Township LA4 management unit (source: DoT, 2016)	36
Figure 4-1	Long-term pathways for a) developed and b) undeveloped land	39
Figure 5-1	Photographs of the Seabird seawall taken during a site visit in February 2017	51
Figure 5-2	Photo monitoring images (NACC 2017) from LP2 showing erosion following storm events in September 2009 (left) and redevelopment and revegetation of dune slope by June 2016 (right).	52
Figure 5-3	Existing rock groyne at northern boundary of the Ledge Point Township South management unit	54
Figure 5-4	Conceptual representation of existing groyne refurbishment and extension, with sand nourishment and potential locations for future groynes	55
Figure 5-5	Conceptual representation of seawall	56
Figure 5-6	Grace Darling Park a) during a storm event (May 2015) and b) February 2017	57
Figure 5-7	Circulation pattern in relation to salient formations from Sanderson and Eliot (1999) and the relative position of Grace Darling Park (red oval)	59
Figure 5-8	Indicative positions of a) new groynes and b) seawall options costed for LA1	60
Figure 5-9	GSC revetment example and conceptual layout from Seashore Engineering (2015)	60
Figure 6-1	Shire of Gingin CHRMAP 2017: 10 year suggested program of work	69



1 INTRODUCTION

1.1 Purpose

Globally, mean sea level (MSL) has risen since the nineteenth century and is predicted to continue to rise, at an increasing rate, through the twenty first century (Intergovernmental Panel on Climate Change [IPCC], 2014), bringing changes to the Western Australian (WA) coastline over the coming decades. To prepare for sea level rise (SLR) induced coastal hazards, such as coastal erosion and inundation, all levels of government are putting processes in place to ensure that communities understand the risks to values and assets on the coast, and to plan to adapt over time.

Changes to MSL over the past century have been observed for the coastline between Fremantle and Jurien Bay. *Sea Level Change in Western Australia – Application to Coastal Planning* (DoT, 2010) reviews information relating to SLR at a local scale and recommends an allowance for SLR be adopted for planning purposes. The WA State Government revised the State Coastal Planning Policy (SPP2.6) in 2013 to incorporate a projected SLR for WA of 0.9 m between 2010 and 2110 (Figure 1-1).

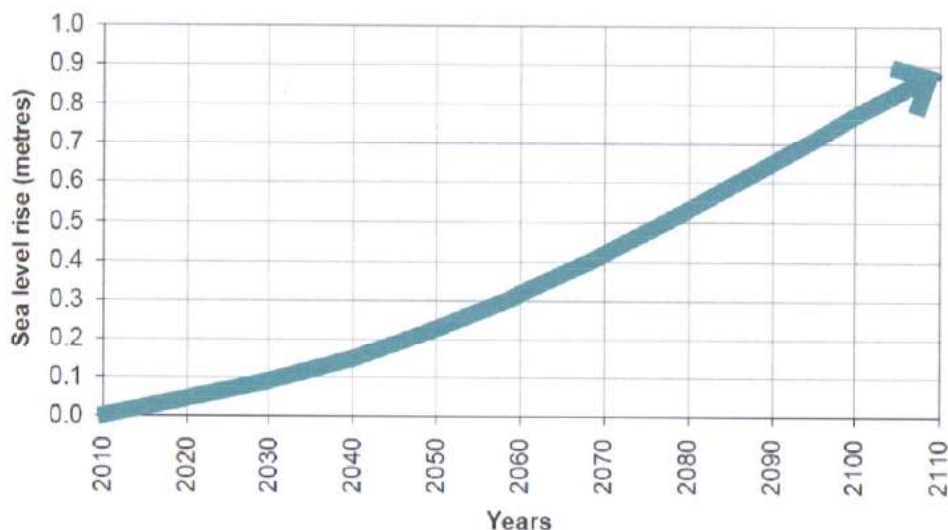


Figure 1-1 Recommended allowance for SLR in coastal planning for WA (source: DoT, 2010)

Gingin's coastline is low lying and sandy, featuring coastal dunes, nearshore reefs and islands, seagrass meadows, fishing stocks and rare vegetation communities. Eliot et al. (2012) describes the coastline of the Hill Primary Coastal Compartment (Guilderton to Jurien Bay) as low lying sandy coastal landforms, identified as being at risk to the impacts of coastal processes and hence, the town sites located on these landforms are vulnerable to changing coastal processes as sea level rises. Coastal processes include a complex set of interactions between atmosphere (climate change) and ocean scale phenomena that interact with the coastal landforms resulting changes to beach shape and form. These processes are often summarised as coastal erosion events associated with short-lived intense storms, shoreline recession associated with climate change-induced sea level rise and oceanic extreme water level events that cause flooding of the coastal areas by sea water. For sandy coastlines, increases in local MSL generally result in shoreline recession, with a "rule of thumb" often used, that a 1 cm rise will result in 1 m of landward recession of the shoreline (Figure 1-2; CoastAdapt, 2017).



Figure 1-2 Influence of sea level rise on coastal erosion (source: CoastAdapt, 2017)

Development of this Coastal Hazard Risk Management and Adaption Plan (CHRMAP) is being undertaken by Cardno on behalf of the Shire of Gingin (hereafter called 'the Shire') to identify risks and plan adaptation responses to natural variability in coastal erosion and the expected impacts of SLR for the Shire's coastline.

The purpose of the CHRMAP is to:

- > Ensure that development and the location of coastal facilities takes into account coastal processes, landform stability, coastal hazards, climate change and biophysical criteria;
- > Guide the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities;
- > Provide for public coastal foreshore reserves and access to them on the coast; and
- > Protect, conserve and enhance coastal zone values, particularly in areas of landscape, biodiversity and ecosystem integrity, indigenous and cultural significance.

This CHRMAP focuses on the impacts of coastal erosion and shoreline recession processes while the impacts of coastal inundation caused by high sea level events associated with, for example, cyclones tracking down the west coast will be addressed by The Shire in future.

1.2 Overview of CHRMAP Process

The key policy governing coastal planning in WA is the *State Planning Policy No. 2.6: State Coastal Planning Policy* (Western Australian Planning Commission [WAPC], 2013a) (herein referred to as 'SPP2.6' or 'State Coastal Planning Policy'). The SPP2.6 policy recommends that management authorities develop a CHRMAP using a risk mitigation approach to planning, that identifies the hazards associated with existing and future development in the coastal zone. SPP2.6 (WAPC 2013a) and the SPP2.6 Guidelines (WAPC 2013b) contain prescriptive details, for example in relation to scales of assessment, storm event types and sea-level rise allowances.

The WAPC (2014a) has also developed the *Coastal hazard risk management and adaptation planning guidelines* which are less prescriptive, but are aimed to ensure that planning is carried out using a risk based approach with due regard to stakeholder engagement, community consultation and education, and that a full range of adaptation options is considered. An overview of the CHRMAP process is shown in Figure 1-3.



Coastal planning in accordance with SPP2.6 also needs to take into consideration the requirements of other planning policies, including *Statement of Planning Policy No. 2: Environment and Natural Resources Policy* (WAPC, 2003) and *Statement of Planning Policy No. 3: Urban Growth and Settlement* (WAPC, 2006).

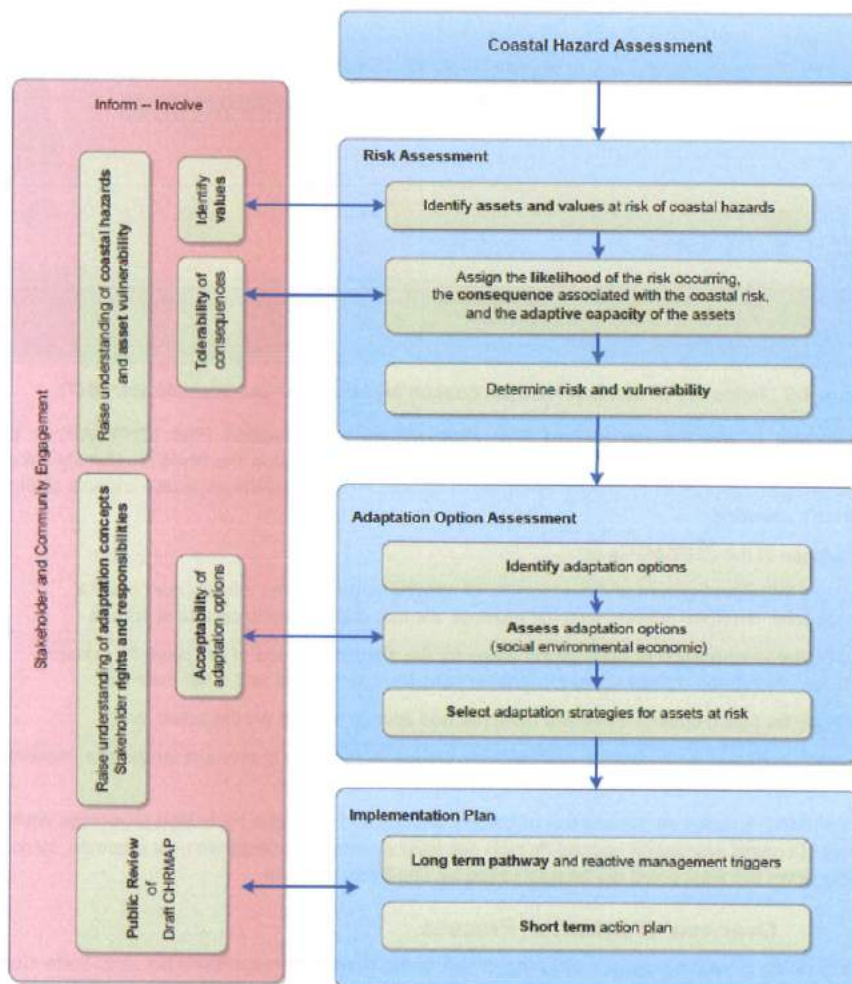


Figure 1-3 CHRMAP methodology flow chart (adapted from the WAPC, 2014a, CHRMAP Guidelines)

1.3 Guiding Principles and Concepts

Underlying the CHRMAP process are a number of guiding principles and concepts that are fundamental to understanding the purpose and outcomes of the process.



1.3.1 Equity

Equity is a concept central to the purpose of the CHRMAP process. Australia's coastline is highly valued by the community as a public asset, with stakeholders ranging from individual property owners adjacent to the coast, to all levels of government, ratepayers within the local government area (LGA), taxpayers in general and users both within and outside of jurisdictional boundaries.

Responsibility for coastal planning lies with both the State and Local Governments, and in making decisions these authorities need to consider equity of access, equity of enjoyment and equity in terms of who benefits, who pays and the allocation of public resources.

Equity is also relevant to considerations about how a protection structure (for example a groyne) might impact coastal processes. Protection structures may exacerbate erosion immediately adjacent to the structure, and limit sediment availability for maintaining beaches and community values some distance from the protected area. Protection structures can also result in significant impacts to coastal ecosystems, well beyond the local area in which the structures are installed (Gittman et al., 2016). Coastal protection may create beneficiaries (those who are protected from hazards) and potentially disadvantage others who may be considered to be affected parties. In this regard, coastal management has similarities to the management of water rights, if one user takes all the water upstream and leaves none for downstream users then this is not considered fair and equitable. In a future of eroding coastlines due to SLR, sand can be a valuable commodity. The challenge is to ensure that planning and management is as transparent and equitable as possible.

1.3.2 Coastal Foreshore Reservation

The coastal foreshore provides beach access, public space for recreation and conservation, is a tourist attraction and provides habitat for native flora and fauna. Importantly, it can also provide a buffer to protect built assets, such as buildings and infrastructure, from coastal hazards.

SPP2.6 Schedule One provides guidance for calculating the component of the coastal foreshore reserve required to allow for coastal processes, to be contained in an appropriate coastal foreshore reserve (determined in accordance with SPP2.6 Clause 5.9) of greater width. This should ensure that, at the end of the planning timeframe, a coastal foreshore reserve is still present and not exposed to the adverse impacts of erosion and inundation. It is behind this reserve that development is able to be considered. Having said this, Schedule One also contains Clause 7 – Variations that outlines specific instances where certain types of development may be considered appropriate within a coastal foreshore reserve, regardless of the allowance for physical coastal processes.

The allowance for physical processes is based on the 100 year hazard line, determined in accordance with SPP2.6. In addition to the allowance for physical processes, such as erosion, the foreshore reserve includes land allocation for maintaining the values, functions and equitable use of the coast over the 100 year planning timeframe (see **Figure 1-4**).

Permanent and easy public access to the beach and coastal foreshore reserves is a fundamental coastal planning objective. The coast and coastal foreshore reserves are public assets which should not, now or in the future, become the exclusive domain of private landowners by virtue of the erosion of coastal reserves or other coastal processes. Coastal reserves should be wide enough to perform recreation and/or conservation functions (according to the reasons for their initial designation) even if they are affected by coastal erosion or diminution due to SLR.

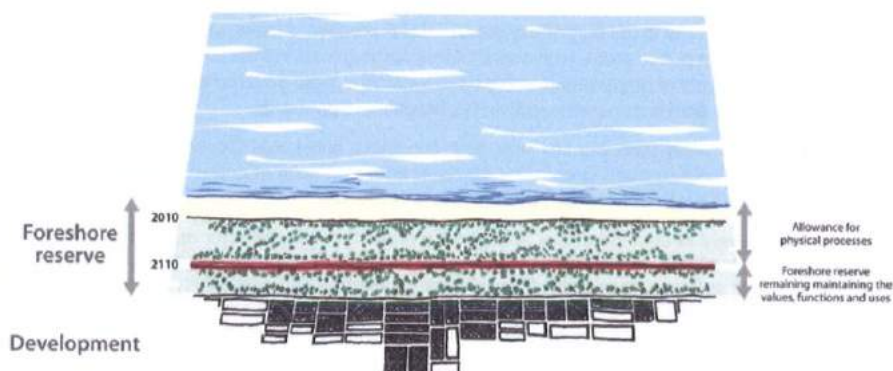


Figure 1-4 Coastal foreshore reserve – sandy coast example (source: WAPC 2013b)

1.3.3 Rights and Responsibilities

In WA, landowners own the rights to develop and use land as granted by land use regulations; they do not own the land itself. There is no law requiring the government (at any level) to provide protection of private property from natural hazards, nor compensation when land is lost to the sea. There are, however, several laws that allow the intervention of governments to enforce eviction if private property becomes uninhabitable, or removal of property if it constitutes a public risk. In the event of coastal erosion causing a property to "fall into the sea", and the land to disappear below the high water mark, the loss is to be borne by the property owner.

Nonetheless, it is the aim of all levels of government to protect the interests of all Australians, and the CHRMAP process ultimately intends to minimise risks and maximise beneficial use of the coast from an economic, social and environmental perspective. Mechanisms for managed retreat may require public expenditure and in some instances, where public good can also be demonstrated, protection may also be publicly funded. Where the benefits of a particular coastal protection measure are limited to private beneficiaries, there is an expectation that the cost will be borne by those beneficiaries under the "user pays" principle.

1.3.4 Hazards and Risks

A hazard is a potential source of harm or adverse impact. Sea level rise is predicted to result in hazardous erosion and coastal inundation along the Gingin coastline. Coastal erosion and inundation hazards are calculated in accordance with SPP2.6 and may be used to identify assets and values at risk of coastal hazards (see Figure 1-3). This current CHRMAP focuses on coastal erosion hazards. Hazards associated with coastal inundation will be included in future CHRMAP reviews and updates, as resources to carry out these assessments become available.

Details of relevant coastal hazard assessments are provided in the Coastal Erosion Hazard Assessment Reports (MP Rogers and Associates [MRA], 2016a and b). Key outcomes are summarised in Section 2, and hazard maps derived from these reports are presented in Appendix A.

Risk is defined as a hazardous event or circumstance and the consequences that may flow from it. Risk is measured in terms of a combination of the likelihood of a hazard occurring and the consequence of that hazard occurring (likelihood and consequence) (see Section 2.9.1).

1.3.5 Assets and Values

An asset is defined as a useful or valuable entity. In the current CHRMAP, assets include:



- > Natural features such as beaches and native vegetation;
- > Approved buildings and other structures (houses, sheds, shade structures);
- > Infrastructure such as fences, lighting, water and sewerage;
- > Roads, paths and walkways; and
- > Coastal structures, such as jetties, boat ramps, seawalls and groynes.

As defined in *Climate change adaptation for settlements and infrastructure – A risk based approach* (AS 5334-2013) an asset's value can be tangible or intangible, financial or non-financial. Examples of non-tangible assets include ecological function and coastal views. The value of an asset includes consideration of risks and liabilities, and can be positive or negative at different stages of the asset's life. Economic assets can be further categorised as public or private.

Values in the context of the CHRMAP further encompass the economic, social (including heritage) and environmental values of the coastal area.

1.3.6 Adaptive Capacity

Adaptation is defined by SPP2.6 as:

"an adjustment in natural or human systems in response to actual or expected stimuli or their effects, which moderates harm or exploits beneficial opportunities. Adaptation is the means for maximising the gains and minimising the losses associated with coastal hazards over the planning timeframe."

WAPC (2014a) further defines adaptive capacity as reflecting the ability of an asset to change in a way that makes it better equipped to deal with external influences (for example coastal climate change impacts).

In this CHRMAP, adaptive capacity has also been assessed in relation to the ease with which an asset can be modified to reduce risk (for example raising the height of a seawall) or relocated (for example moving a wooden walkway inland).

1.3.7 Vulnerability

Vulnerability has a specific meaning in the context of risk-based approaches to climate change adaptations, in accordance with Australian Standards (AS 5334-2013) and SPP2.6, which defines vulnerability as:

"the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity. Systems that are highly exposed, sensitive and less able to adapt are vulnerable"

This report uses vulnerability as the final outcome of the risk assessment process, combining likelihood and consequence of hazards with the adaptive capacity of assets in a stepwise process (see the 'Risk Assessment' component of Figure 1-3).

1.3.8 Temporal scales

Coastal hazard assessment and management needs to consider a number of different timeframes (Figure 1-5). SPP2.6 specifies the need for identifying risks and extending planning considerations out to a one hundred year planning horizon (also described as 'long term' in this report). Practical planning for implementation, from the Shire's point of view, requires a focus on the 'short term' (up to the 2030 planning timeframe). 'Medium term' is also used throughout this report to refer to the period up to the 2070 planning timeframe.

The need for identifying potential long term risks is important to ensure that these risks are taken into consideration in the Shire's asset management strategy and statutory planning framework. The long



term perspective is also important for management of community expectations and gives potentially impacted stakeholders prior notice of the associated hazards.

This CHRMAP includes an assessment of immediate to long term vulnerability of coastal assets, associated with predicted sea level rise. Long term adaptation pathways have been developed for areas of the coast being assessed, as required by SPP2.6. Short term implementation plans have also been developed, focusing on areas where assets have been assessed as vulnerable by the 2030 planning timeframe. These short term implementation plans are designed such that they do not prevent the long term pathway from being realised.

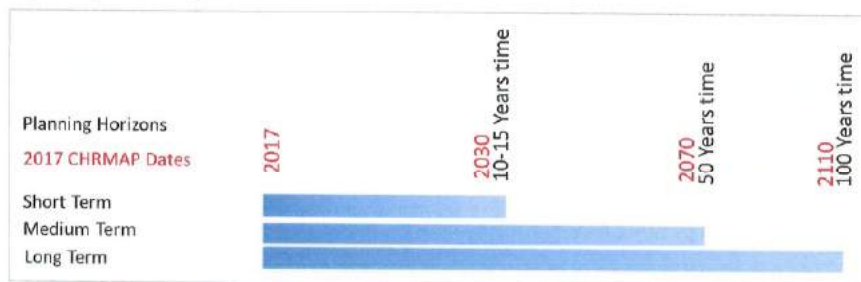


Figure 1-5 Coastal planning timeframes used in this report

1.3.9 Spatial scales

In accordance with SPP2.6, the coastal hazards along the Shire's coastal zone have been identified at a coastal sediment cell scale (MRA, 2016a and b). The policy requires assessment at this scale to account for the impact of existing controls and future management techniques on areas of the coast that are away from the direct area of interest (a common example of this is erosion down-drift of a groyne or marina). For more information on the classification of coastal sediment cells, and their function, within the Shire see Stul et al., 2014.

Using the hazard lines derived for the broader sediment cell scale this CHRMAP then looks at finer spatial scales, to assess the vulnerability of assets and to simplify management planning. 'Management units' have been defined based on the physical attributes of the coast. Within each management unit assets are considered individually or grouped according to the type of asset and in consideration of current land use. The risks and vulnerability of individual or groups of assets within each management unit have then been assessed.

1.3.10 Adaptive management

'Adaptive management' is a term given to a structured, iterative process of robust decision making in the face of uncertainty (Allan & Stankey, 2009). In the context of this CHRMAP, it allows for predictions of coastal hazards and the development of long term planning pathways to mitigate against risks, while at the same time acknowledging that predictions are likely to change over time. Management pathways have been developed based on predictions of present and future coastal erosion hazards, but implementation of management techniques should be driven by appropriate triggers (Figure 1-6). This approach ensures the timing of management (or changes in management) is appropriate to the actual sea level rise effects as and when they occur in future (for example, if shoreline recession is occurring faster than predicted, the management action to retreat may be implemented earlier than predicted).

The CHRMAP, therefore, recommends appropriate triggers to guide management. Monitoring programs are also recommended to identify when triggers have been reached, and to validate the current predictions of shoreline recession and the extent of coastal erosion hazards. Recommendations for further investigation and review are also made to better inform the refinement of management pathways in the future.

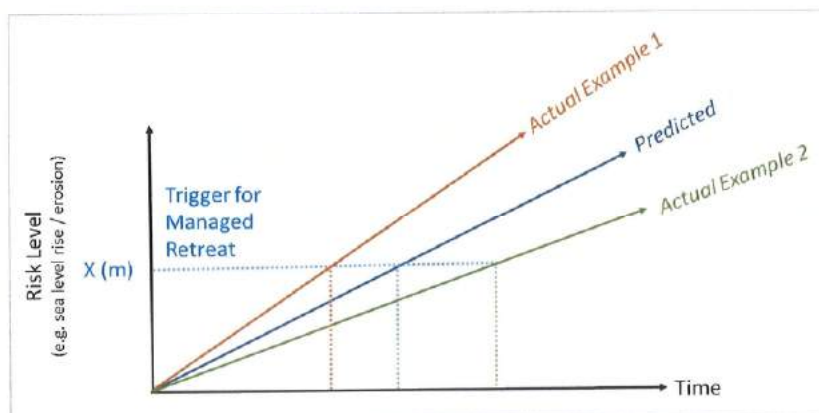


Figure 1-6 Conceptual timing for managed retreat in relation to predicted coastal hazards

1.4 Key Coastal Processes Concepts

A basic understanding of coastal processes is important for understanding the issues and constraints associated with managing the hazards of sea level rise and coastal erosion. **Figure 1-7 a)** illustrates the multiple processes involved in adding (accretion; yellow) and removing (erosion; red) sediment from the shoreline. The size of the arrows broadly represent the volume of sediment movement involved in each process. **Figure 1-7 b)** shows how a storm can remove sediment from the beach and reshape the shoreline profile, due to a combination of elevated water level and wave action. As mean sea level increases, storms can have a greater inland 'reach' and less of the removed sediment returns to the beach, leading to long term recession.

A key step in the coastal hazard identification is the definition of a horizontal shoreline datum (HSD) along the coastline, which "should define the active limit of the shoreline under storm activity" (WAPC, 2013a). Effectively the HSD is the shoreline at a particular point in time that can then be used as a bench mark or reference for assessing historic and future potential shoreline movement. For the Shire's predominantly sandy coastline, this has generally been determined from the 2012 LIDAR survey data as the point of intersection of the local peak still water level (determined at each town) with the beach/foredune surface level profile. This point is typically close to the seaward margin of coastal vegetation at the time of assessment (see MRA, 2016a and b and GHD, 2015). The HSD is the bench mark from which the extent of coastal hazards, at each planning timeframe, is measured. The HSD presented in hazard mapping for this CHRMAP has been defined for the 'present day' at the time that each coastal hazard assessment was undertaken (generally based on the 2012 LIDAR survey information). The HSD is constantly moving and its position, relative to assets and future monitoring of the shoreline position and determination a future HSD is one of the key triggers for implementing management responses. It must be noted that future revisions of this CHRMAP will be based on new information, and the HSD and hazard lines will be recalculated accordingly.

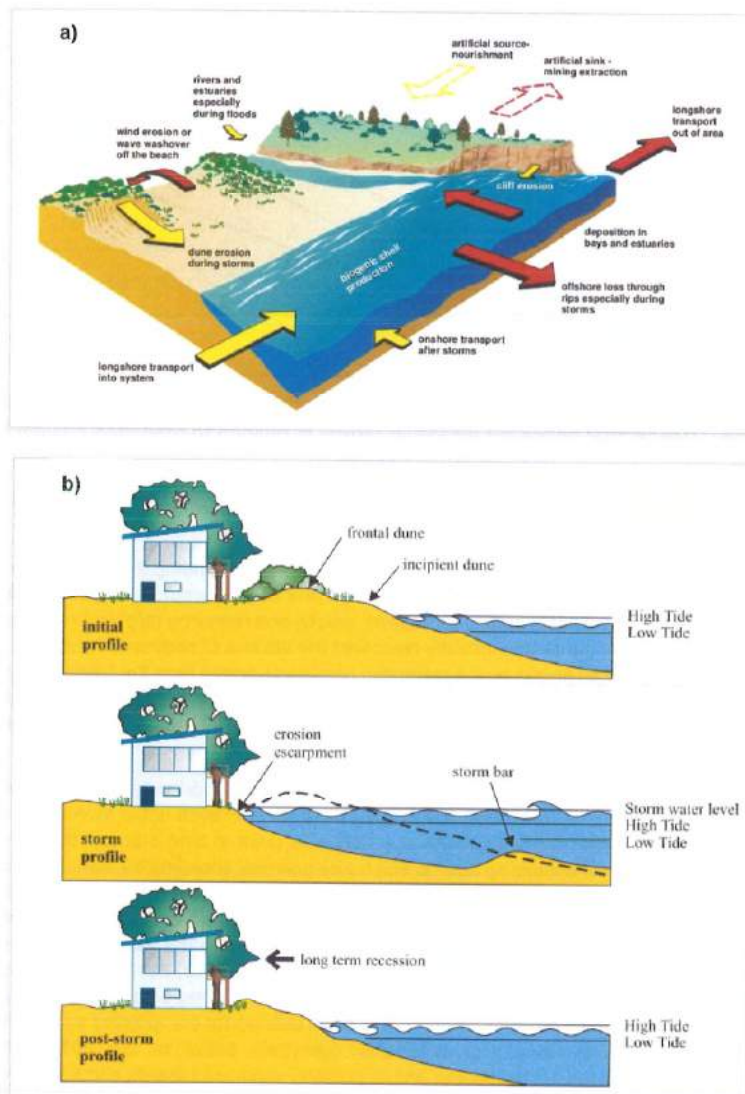


Figure 1-7 Conceptual representation of key coastal erosion concepts; a) sediment transport processes and b) long term beach recession due to permanent sand loss (source: NSW Department of Land and Water Conservation, 2001)



1.5 Previous Assessments

In 2012 the WA Department of Planning commissioned the study *The Coast of the Shires of Gingin and Dandaragan (WA): Geology, Geomorphology and Vulnerability* (Eliot et al, 2012). This study assessed the sensitivity and exposure of coastal landforms from Guilderton to North Head (north of Jurien Bay) and identified that all town sites along this stretch of coast are located on landforms that have a moderate or moderate to high vulnerability to changing coastal processes (winds, tides, currents, waves and sea levels). The study recommended detailed investigations to identify the potential extent of long term coastal erosion and inundation at priority locations.

In 2013 the Shire partnered with the Shire of Dandaragan and the Northern Agricultural Catchments Council (NACC) to identify the range of data and information required to undertake coastal hazard assessments at the priority locations outlined in the *Hill Primary Coastal Compartment Information and Data Gap Analysis* (Danese, 2013).

In 2014, in accordance with the recommendations made by Danese (2013), the Shire partnered with the Shire of Dandaragan, the NACC and the WA Department of Transport to undertake a preliminary assessment of coastal hazards at each town site in the study area. The preliminary findings of the assessment identified that:

1. Adaptation planning for coastal erosion is a priority at Seabird, Ledge Point, Lancelin, Cervantes and Jurien Bay town centre. Guilderton and South Jurien Bay (from Island Point south) were identified as low priority areas, mainly due to the relatively large coastal setback distance between the high water mark and built assets at these locations and, therefore, lack of a short term threat from coastal erosion;
2. Adaptation planning for coastal inundation is a priority at Lancelin, Cervantes and Jurien Bay. This is mainly due to the low lying nature of, and proximity of assets to, the shoreline at these locations;
3. Adaptation planning for coastal inundation at Guilderton requires a detailed investigation of the combined effects of inundation from the ocean and inland rainfall events, due to Guilderton's location on the Moore River estuary.

This current 2017 CHRMAP addresses the first of these recommendations with a focus on the areas identified at risk from coastal erosion hazards.

1.6 CHRMAP Format

This document has been designed to inform the community and provide direction to the Shire for planning for climate change-induced coastal erosion risks facing the coastal townships of the Gingin Shire. An overview of the CHRMAP process and how it has been covered in the structure of this document is provided in **Figure 1-8**. The structure of the document also allows for the information base and planning context of individual assets or groups of assets to be separated from the main document with Appendices formatted as separate sheets provided for each of the coastal assets. The Appendices are as follows:

- > **Appendix A** – Hazard Maps by Management Unit
- > **Appendix B** – Value Maps
- > **Appendix C** – Asset Information for each of the Management Units
- > **Appendix D** – Technical Note on Risk Assessment Methods
- > **Appendix E** – Risk Assessment Ratings and Results
- > **Appendix F** – Multi-Criteria Analysis Results
- > **Appendix G** – Multi-Criteria Analysis Summary
- > **Appendix H** – Planning Controls Discussion
- > **Appendix I** – Long Term Pathways



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Shire of Gingin

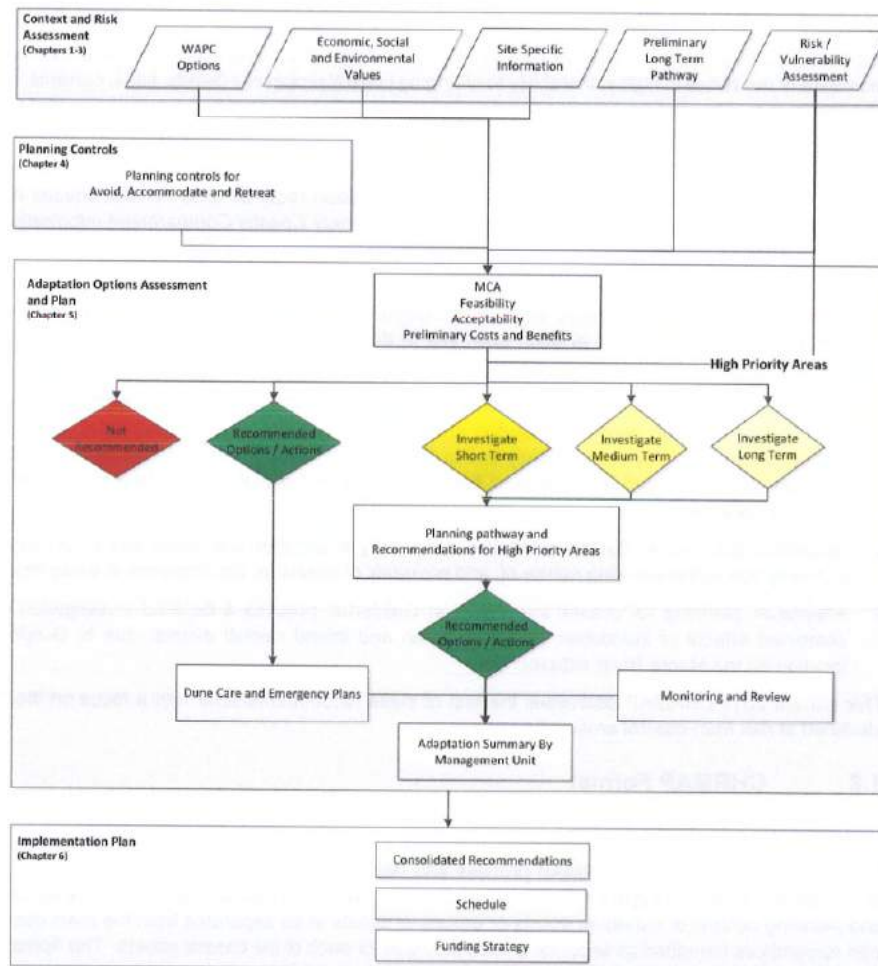


Figure 1-8 Overview of the CHRMAP process and its relationship to the chapters in this document.



2 ESTABLISHING THE CONTEXT

2.1 Shire of Gingin

The Shire of Gingin is located 84 kilometres north of Perth. There are five townships within the Shire: the inland town of Gingin, and the coastal towns of Guilderton, Lancelin, Ledge Point and Seabird, of which only the latter three are considered in this CHRMAP (Figure 2-1).

Gingin is one of the fastest growing rural areas in Western Australia and it is anticipated that the Shire's population will grow from 5,000 to approximately 6,600 by 2023, increasing to 7,900 by 2031 (Shire of Gingin, 2017). Agriculture (more recently including horticulture) is the Shire's primary economic contributor. In addition to rural industries the Shire's economy is also based around tourism, with coastal areas in particular experiencing a large influx of people during the summer holiday season. Annual Shire rate revenues are in the order of \$7M.

The Shire of Gingin (2016a) Strategic Community Plan (2015-2025) lists the dominant demographic in the Shire's coastal towns are "empty nesters" aged 60 – 69 (around 20% of the population), with around 40% of households having no children. This is in contrast to rural areas which are dominated by parents and home builders (24%) aged between 35 and 40.

This CHRMAP focuses on the coastal zones within the existing gazetted town sites including future development areas, where the services from human-made and natural assets provide key social, economic and environmental values to the community. Coastal areas outside of the towns may also be exposed to the potential impacts of coastal hazards. Any future development outside of the study areas should avoid potential coastal hazards. The absence of human-made assets in these locations is likely to allow for the natural adaptation of the coastline to sea level rise. A brief description of each of the townships is provided in the following three sub-sections and a summary of their key attributes is presented in Table 2-1 and the coastal management units boundaries and zoning of properties located seaward of the 2110 Hazard Line are presented in the maps shown in Appendix A.

Table 2-1 CHRMAP location key attributes

CHRMAP Area	Number of Ratepayers ¹	Estimated Number of Residents ²	Approximate coastline length assessed (km)	Number of Management Units
Seabird	140	80	1.7	2
Ledge Point	379	200	3.1	4
Lancelin	754	600	5.1	4

¹ Estimated as the number of improved blocks, ² Estimated



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Shire of Gingin

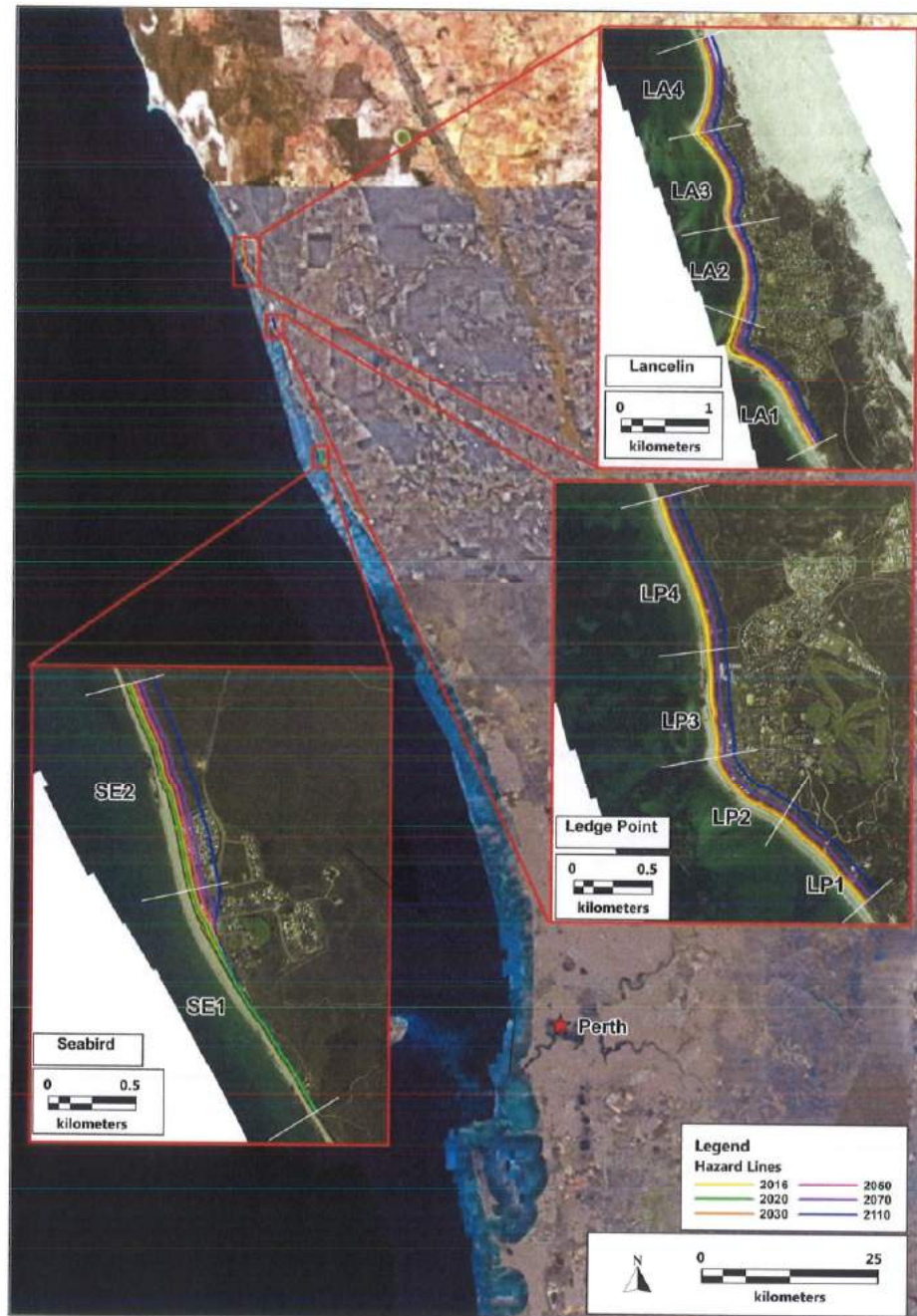




Figure 2-1 CHRMAP location map, townships and management unit boundaries

2.2 Seabird

Seabird is located approximately 40 km north of the Perth Metropolitan area (**Figure 2-1**). The townsite was gazetted in 1968 and currently has an estimated population of around 80 (**Table 2-1**).

The township has been subject to ongoing coastal erosion, which has caused the loss of a substantial portion of the township's primary coastal dunes and a coastal road (Turner Street). Historically, management of erosion has included beach nourishment and temporary protection works (MRA, 2016a), before a seawall was constructed in 2015 (and extended in 2016) to protect residential properties. Funding for the seawall was provided by the State Government and ongoing responsibility for maintenance and management of the structure will be one of the considerations of this CHRMAP. The seawall is currently being managed by the Shire of Gingin under a license issued under section 91 of the Western Australian *Land Administration Act (1997)* (LAA) by the Department of Lands.

The townsite is on a broad salient (coastal point) in a localised area of greater vulnerability relative to the general coastline within its coastal cell, which is considered to have a moderate vulnerability (Eliot et al, 2012). There is some beach rock (Tamala Limestone) visible along the coast in front of the township and scattered offshore reefs which provide some protection from incoming wave energy. This site lacks, however, the significant reefs or offshore islands which are present off some townships further to the north. MPR (2016a) collated geophysical data collected by Gordon Geological Consultants and the DoT in 2002 to confirm the presence of a limestone cliff, of low to medium strength, under the dunes to the south of the Coastal Point. It was estimated that this cliff deviates away from the coast in line with the northern end of Turner St and extends to the junction of McCormick and Edwards Streets. This geological feature has been taken into consideration in the risk assessment process (see **Section 3.2.1**).

During a site visit in early 2017, the presence of the seawall was noted to have limited the beach extent in front of the town to the north of the seawall. As the seawall was designed as an interim measure public access to the beach from the top of the seawall has not been allowed for and public open space along the foreshore within the town is subsequently very limited. The coastal values for Seabird are presented in **Appendix B** and the map shows public beach access to the north and south of the seawall.

The hazard assessment extended for 2.6 km along the coast (MRA, 2016a), and for risk assessment and adaptation planning purposes, this CHRMAP has divided the Seabird coastal area into two management units (**Figure 2-1**). Development potential beyond the existing township has not been identified in the Shire's Local Planning Scheme (Shire of Gingin, 2012a) (see maps in **Appendix B**).

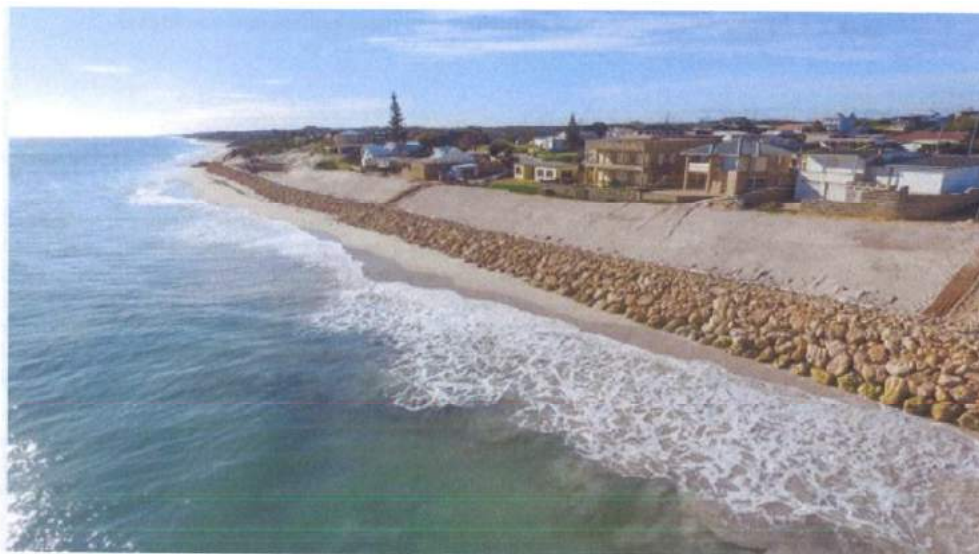


Figure 2-2 Photograph of seabird in 2016 following construction of the seawall (source: DoT)

2.3 Ledge Point

The township of Ledge Point is located approximately 70 km north of the Perth Metropolitan area (Figure 2-1) and has an estimated population of around 200 (Table 2-1). The townsite was gazetted in 1955, intended for retirees and holiday housing and to service the local fishing and crayfishing industries (Landgate, 2017). It is understood that many of the properties in the town are holiday houses, owned by farmers from inland parts of the Shire. The township has a general store, cafe/fish and chip shop and a country club which has a restaurant, bar, golf course, tennis courts and lawn bowls. Ledge Point is well known as a windsurfing venue, hosting the Ledge Point to Lancelin Windsurfing Classic in January each year. The beach and nearshore waters are used for launching and mooring of boats.

Ledge Point lies at the boundary of two coastal cells; Cell 11 (Green Reef to Ledge Point) and Cell 12 (Ledge Point to South Pacific Reef) and the coastline in both these cells was assessed as having moderate vulnerability (Eliot et al, 2012). Broad scale geological mapping covering the Ledge Point townsite indicates coastal limestone may be present along the coast in this area, however no rock was visible on the beach or in the dunes during a site visit in December 2015 (MRA, 2016b).

The Ledge Point townsite is located on a sandy foreland formed in the lee of a shore-parallel reef (Short, 2006). There are no islands offshore, however, both offshore and nearshore reefs protect the Ledge Point beach from wave energy (MRA, 2016b).

The hazard assessment extended approximately 3 km along the coast (MRA, 2016b), and for risk assessment and adaptation planning purposes, the CHRMAP has divided this area into four management units (Figure 2-1). There are two groynes, the smaller 'southern groyne' (constructed in 1975 at the boundary between management units LP2 and LP3) and the larger 'northern groyne' (constructed in 1985 slightly to the south of the centre of management unit LP3). The southern-most, LP1, and northern-most, LP4, management units are predominantly undeveloped at present, but the potential for development of these areas has been identified in the Shire's Local Planning Scheme (Shire of Gingin, 2012a). A map depicting the coastal values for Ledge Point is presented in **Appendix B**.



The main coastal node for public recreation and tourism is focused around Key Biscayne Park, to the north of the northern groyne. The park comprises a large grassed park area that has had extensive coast care attention, including dune rehabilitation. The beach area between the two groynes is the main swimming area, with the beach to the south of the southern groyne being used for boat launching, with four wheel drives and tractors traversing and parking on the beach. A new boat-launching facility/marina has been proposed for a location to the south of the study area.

The main coastal erosion risk area is in management unit LP3, where a number of private residences along DeBurgh Street overlook the beach to the south of the southern groyne.



Figure 2-3 Aerial view of Ledge Point in 2016 (source: DoT)

2.4 Lancelin

The township of Lancelin is located approximately 100 km north of the Perth Metropolitan area (Figure 2-1) and has an estimated residential population of around 600 (Table 2-1). The townsite was used in the late 1940s for camping and as a port for the lobster fishery. The townsite was declared in 1950 and gazetted in 1953 (Landgate, 2017). The township is the regional centre for the Upper Coastal area of the Shire (Shire of Gingin 2016b). Lancelin is well known as a windsurfing venue, hosting the Ledge Point to Lancelin Windsurfing Classic in January each year. Crayfishing is a significant local industry, as well as seasonal tourism. The town has a jetty managed by the DoT.

Lancelin townsite occupies three sandy forelands formed in the lee of Edwards Reef to the south and Lancelin Island to the north (Short, 2006). There are two islands close to the shore, the smaller, rocky Edward Island and the larger, vegetated Lancelin Island to the north (Figure 2-4). Edward Island is connected to an approximately 850 m long shallow nearshore reef which provides good protection from wave energy to the adjacent shoreline (MRA, 2016b). There is also a shallow nearshore reef that is approximately 450 m long, located in between the two islands and extending between approximately 500 m and one km offshore. Deeper passages exist between the shallow reefs and islands, which allow boat access to Lancelin and also permit wave energy to reach the shoreline (MRA, 2016b).

The Lancelin area lies within three sediment cells (13-15, Eliot et al, 2012), which were assessed as having moderate (cells 13-14) or moderate-high (cell 15) vulnerability. Broad scale geological mapping covering the Lancelin townsite indicates Coastal Limestone may be present along the coast in this area, however, no rock was visible on the beach or in the dunes during a site visit undertaken in December 2015 (MRA, 2016b). In the absence of detailed geotechnical information, the Lancelin area was classified as a sandy coast for the purpose of coastal hazard assessment (MRA, 2016b).

The hazard assessment (MRA, 2016b) extended approximately five km along the coast, and for risk assessment and adaptation planning purposes, the CHRMAP has divided this area into four



management units (**Figure 2-1**). The southern-most management unit is largely undeveloped, with the intention to use the area primarily for sporting and recreation purposes. The area has also been identified for linking the town to future urban development at Lancelin South (Shire of Gingin, 2012a). A map depicting the coastal values for Lancelin is presented in **Appendix B**.



Figure 2-4 Aerial view of Lancelin in 2009 (source: Birdseye View Photography, <http://www.birdseyeviewphotography.com.au/lancelin.shtml>)

The Shire's local planning strategy identifies three coastal nodes for public recreation at Lancelin. The first is at Edward Island Point and includes Grace Darling Park. The second is in the coastal foreshore park in the town centre and the third is at Lancelin Point. Grace Darling Park, in management unit LA2, has been affected by erosion over recent years, causing public concern and highlighting coastal erosion issues.

2.5 Stakeholder and Community Engagement

2.5.1 Objectives

Community and stakeholder engagement is an important element of the CHRMAP process, as depicted in **Figure 1-3**. It is necessary to identify the values provided by the study area, to determine the tolerability of risks and to assess the acceptability of adaptation options designed to preserve the area's value.

The objectives of the community and stakeholder engagement process include:

- > To inform the community about the extent of potential coastal hazards, adaptation strategies available to respond to those hazards and the need for flexibility in response to future environmental, social and economic changes;
- > To explain the State and local governments' responsibilities and capacity to respond to potential coastal hazards;
- > To explain the benefits and challenges of each adaptation strategy, in terms of the meaning for residents and landowners, as well as the broader community;
- > To provide community members with multiple opportunities to provide input into proposed adaptation strategies, and to offer alternative strategies or to voice questions and concerns;



- > To receive and document feedback and concerns regarding each adaptation strategy from community members and affected residents and landowners; and
- > To report on the feedback, including analysis that highlights the level of community understanding, the principal concerns and preferences concerning the proposed adaptation strategies and funding mechanisms, and preferred methods of continued community engagement.

2.5.2 **Methods**

Since 2012, the Shire has worked closely with the Shire of Dandaragan, the NACC, State Government agencies, coastal specialists and the local community to investigate the hazards and risks to the Shire's coastline, and to develop strategies for adapting to them. In 2013 and 2014 the Shire provided opportunities for the community and stakeholder groups to learn about the Shire's CHRMAP process through workshops with government agencies and public information sessions. Key stakeholders identified and engaged throughout the engagement process in listed in **Appendix B**.

Stakeholder and community engagement undertaken for this CHRMAP has focused on capturing the coastal values of the community, informing the public about coastal hazards and the CHRMAP process, and gauging attitudes towards various adaptation options (**Figure 2-5**). A community engagement session was facilitated by the Shire in Lancelin on the 28th of May 2017. This was followed by an online survey that was conducted in June 2017.

2.6 **Social and Environmental Values**

An ecosystems services approach has been used to identify the natural and social values of the coast (**Figure 2-5**). The results of recent community engagement highlighted the strong sentiment regarding the natural values of the beach. Respondents sometimes struggled to find words to describe the importance of the beach to them and their sense of health and wellbeing. When asked if there were any other values the coast provided them, an example answer was:

"Yes too many to list, e.g. aesthetics, relaxing, peacefulness, regeneration, good sources for juvenile aquatic animals, space for all animals including those pesky humans, preservation for, & adaptability for climate variability"

It is difficult to place an economic value on natural coastal assets such as the beach and dune systems. Identifying the value of natural assets through community engagement, and maintaining a focus on these values throughout the CHRMAP process is critical to its success. Maps showing social, cultural and environmental values for the CHRMAP study areas are provided in **Appendix B**. The maps provide a broad indication of threatened ecological communities, rare and endangered flora and fauna potentially present (noting that, as required by government agencies, the locations are only approximate to within the Management Unit).

While the results of the surveys are discussed in the following section 2.7 the general sentiment of the community may be summarised as follows:

- Strong disagreement that protection of private property should be prioritised over preservation of beaches,
- Strong support for relocation of assets and let nature take its course,
- Strong support for limiting intensity of development in hazard areas, and
- Strong support for informing landholders of hazard risk.

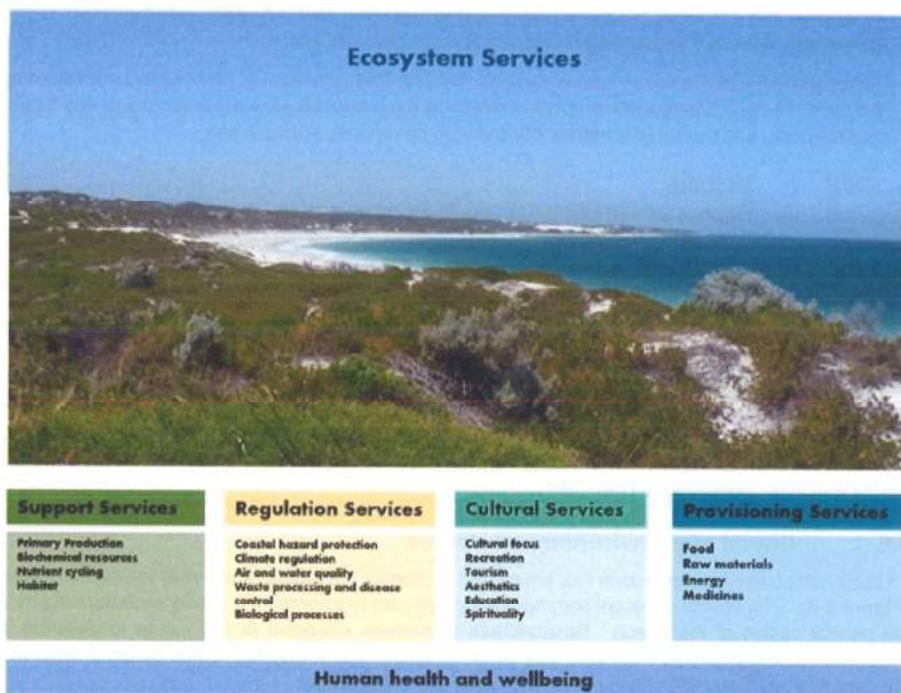


Figure 2-5 Ecosystem services approach to defining coastal values

2.7 Survey Results

2.7.1 Context

Contextual information from the online survey is provided in **Figure 2-6**. The results show that more than 50% of respondents visit the beach on a daily or weekly basis, with the most common answer for which beach is visited being the "Lancelin main beach". Indicative beach usage by management unit based on the survey results is provided in **Table 2-2**.

While most respondents believed they have some idea of the causes of coastal erosion, only around 10% considered themselves to be very well informed. Slightly more than half had viewed the hazard maps, but there was a high level of concern (45% very concerned and 35% somewhat concerned) about coastal erosion.

Most respondents were between 60 – 75 years of age and were landowners in the shire, but a majority did not live in areas identified as being vulnerable to coastal erosion. As introduced in **Section 2.1**, "empty nesters" aged 60 to 69 are the dominant demographic in the coastal towns of the Shire, and it is a positive result that the survey reflects this.

Of the 80 respondents who provided their postcode, the majority (73%) were from either Lancelin, Guilderton or Gingin and the remaining 17% of respondents were from outside the Gingin LGA.

**Table 2-2 Indicative beach usage by management unit based on survey results**

Seabird (SE)		Ledge Point (LP)		Lancelin (LA)	
Management Unit	Number	Management Unit	Number	Management Unit	Number
SE1	13	LP1	0	LA1	40
SE2	11	LP2	8	LA2	54
		LP3	6	LA3	32
		LP4	2	LA4	12

2.7.2 Coastal Values

The questions on coastal values showed strongest support for opportunities to use beaches for passive recreation, and ongoing provision of foreshore reserved for current and future generations (**Figure 2-6**). Opportunities for commercial enterprises and active recreations (i.e. boat ramps and jetties) received the least support.

2.7.3 Adaptation Options

The responses relating to adaptation options showed very strong support for retaining public access to beaches and foreshore reserves and preserving coastal dunes and vegetation for future generations (**Figure 2-7**). There was also strong support for not allowing more intensive development (such as units where there is a single house) in hazard areas.

Respondents strongly agreed that private landowners should be informed about the risk of erosion when purchasing or developing in hazard areas.

There was a high level of disagreement for protecting private property from erosion, when this results in the loss of the public foreshore reserve and beach access. There was also strong disagreement for allowing the continuation of approved land uses in developed areas until erosion becomes intolerable, suggesting that a "do-nothing" approach is not acceptable. The responses to these questions have been taken into consideration in formulating the adaptation plans discussed in **Section 4**.



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Shire of Gingin

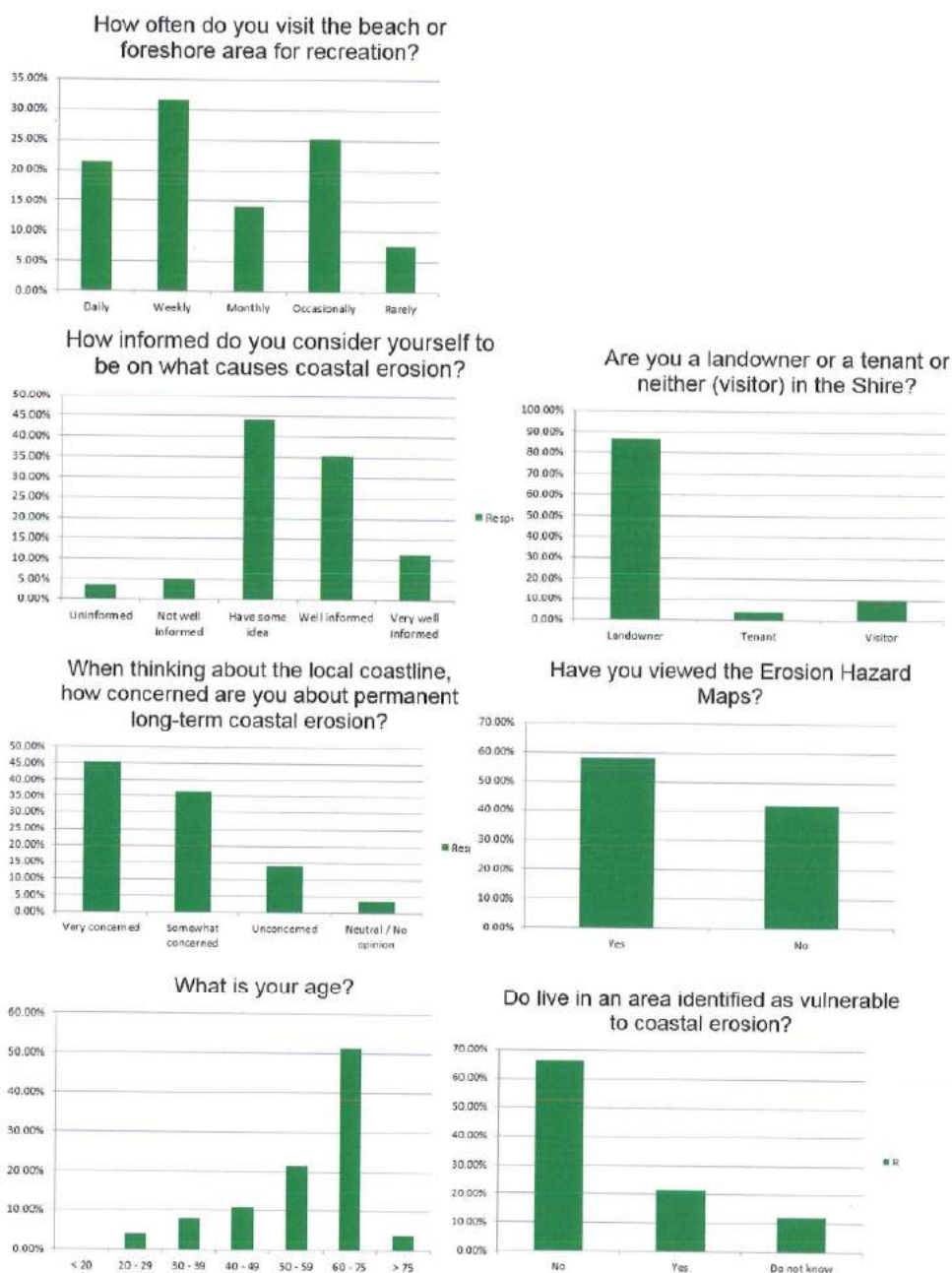


Figure 2-6 Summary charts of online survey questionnaire responses

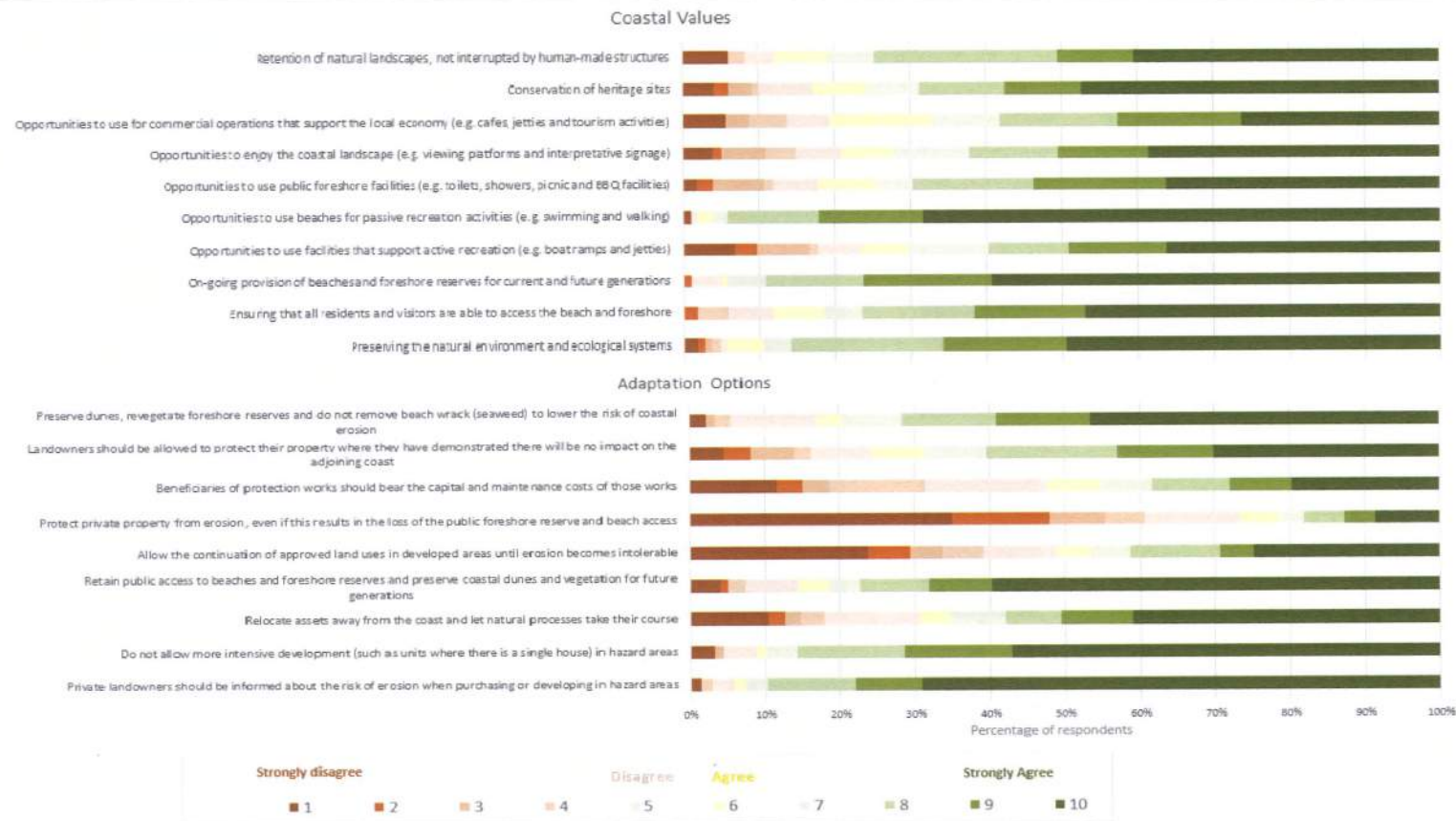


Figure 2-7 Responses to questions “what do you value about the coast” and “how strongly do you support the following erosion management approaches”. Generally, more green indicates more agreement and more red indicates more disagreement.



2.8 Planning Framework

Planning in Western Australia is guided by the *State Planning Framework*, that outlines the relationships and hierarchy of responsibilities of different levels of government and planning instruments, as summarised in **Figure 2-8**. Strategic plans at State, regional and local levels inform the development of statutory controls.

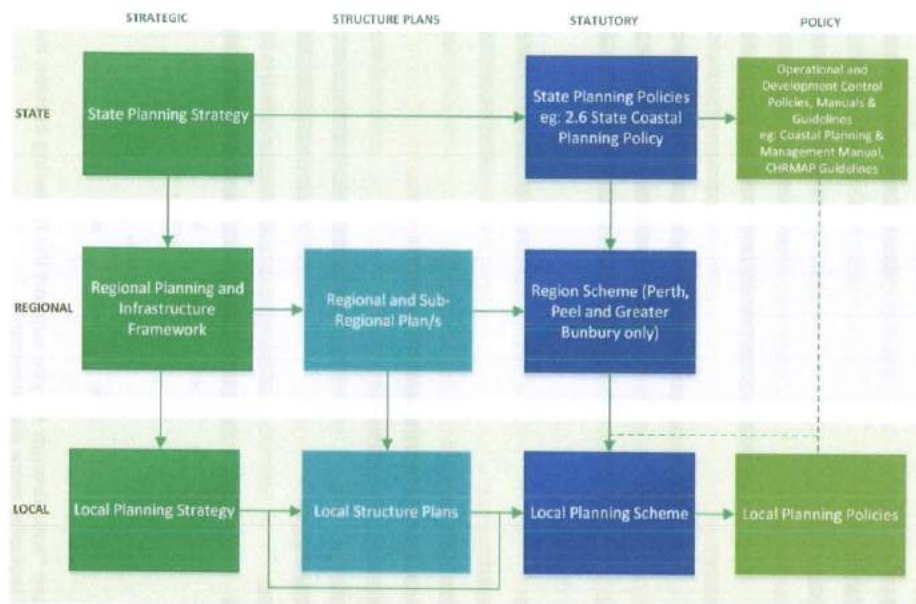


Figure 2-8 Planning context overview

The key strategic planning documents that have guided development of the coastal towns within the Gingin shire are:

- State Planning Strategy 2050 (State)
- Wheatbelt Planning and Infrastructure Framework 2015 – (Regional)
- Shire of Gingin Local Planning Strategy 2012 (Local)

In addition to these strategic guidance documents the following Structure Plans and Policies provide the context for development in the local areas:

- Local Planning Scheme No. 9 (LPS 9)
- State Planning Policy: Coastal Planning Policy (SPP 2.6)
- Local Planning Policy 1.2 Foreshore Protection Areas (LPP1.2)
- Local Planning Policy 1.4 Foreshore Reserves along Water Courses (LPP1.4)

The requirement for Local governments to produce a CHRMAP is described in SPP2.6 and the WAPC (2014a) guidelines outline the steps for local government to develop the CHRMAP document. The CHRMAP is a local level policy document that can provide recommendations for implementation of local planning adjustments, if required and adopted by the Shire, to bring about change in line with mitigating the future effects of sea level rise and coastal erosion on coastal infrastructure.

The planning process, in relation to Gingin, is outlined in the following sections.

2.8.1 Strategic Plans

The *State Planning Strategy 2050* provides a strategic framework, principles, strategic goals and strategic directions for planning and development in Western Australia. In relation to climate change, this strategy identifies the Shire of Gingin coast as being at risk of coastal landform change. It makes key statements



that are fundamental to the approach taken to coastal hazard risk assessment and adaptation planning, including:

- > *Retaining natural bushland and coastal areas that are accessible is essential to human health and a sense of wellbeing, and*
- > *All decisions about sustained growth and prosperity must strike the appropriate balance between environmental issues, economic conditions and community wellbeing.*

At the regional level the *Wheatbelt Planning and Infrastructure Framework 2015* (Wheatbelt PIF) identifies the following key regional strategic planning initiatives:

- > *Identification required planning responses following completion of the Coastal Hazard Risk Management and Adaptation Planning Study being carried out by the shires of Dandaragan and Gingin, and*
- > *Facilitation of long-term strategic planning for the lower Gingin – Indian Ocean Drive corridor, focussing on possible economic and employment opportunities, service provision and the preservation of environmental assets (the latter including coastal assets).*

The *Shire of Gingin Local Planning Strategy 2012*, generally aligns with the Wheatbelt PIF strategy direction, placing importance on both planning for long-term predicted shoreline movement and other impacts of climate variability, such as storm surge.

The *Local Planning Strategy* identifies coastal erosion and management of coastal dunes as key issues for the Shire, acknowledging that the vulnerability is predicted to worsen as sea level rises in response to climate change. It recognises that a strategic approach is needed in managing coastal land use, future development and the impacts of coastal processes, including dune movement, blow outs and erosion. This strategy also maps general areas identifying 'Coastal setbacks required in accordance with State Planning Policy'. These areas include the coast north of Lancelin, coast in the southern parts of Ledge Point, Guilderton north of the Moore River, and Seabird. Since the strategy's adoption in 2013, more detailed coastal studies (MRA, 2016a and 2016b, GHD, 2015) have provided improved definition of vulnerable areas.

Within the coastal areas designated at risk from sea level rise and coastal erosion at the 100 year planning horizon the preparation of this CHRMAP assumes the more recent strategies and adaption hierarchy outlined in SPP2.6 (2013) and the WAPC CHRMAP guidelines (2014a) will take precedence when considering the appropriate adaptation strategies for the Gingin Shire coastline.

2.8.2 Statutory Plans & Policies

State Planning Policies (SPPs) provide the highest level of planning policy control and guidance in Western Australia and are prepared under Part 3 of the Planning and Development Act (2005) (PDA). The State Coastal Policy (SPP 2.6) is an environmental sector policy consistent with the higher order SPP 2 Environmental and Natural Resources Policy.

The key statutory planning document for the Shire of Gingin is Local Planning Scheme No. 9 (LPS 9), gazetted on 27 September 2012 and amended several times since. LPS 9 applies zones and reserves to land within the Shire and outlines permissibility of land uses, requirements for development and processes for seeking proposed development approval.

Recent relevant amendments to LPS 9, regarding coastal development, planning and hazards, require compliance with the provisions of SPP 2.6, in accordance with the PDA. This amendment thereby effectively gives statutory effect to the SPP 2.6 under LPS 9.

2.8.3 Local Structure Plans

Local Structure Plans, also referred to as Outline Development Plans (ODPs) can be made under LPS 9 via the mechanisms provided in Part 4 of the Deemed Provisions set out in the Planning and Development (Local Planning Scheme) Regulations 2015 (the Regulations). In the context of planning control and guidance, an ODP is the same as a structure plan. A structure plan, while not a statutory document, provides guidance for the future subdivision and development of land.

The Shire has only one structure plan relating to coastal land, the ODP for Moore River South adopted following the completion of a Foreshore Management Plan in August 2014. This ODP considers the same



coastal hazard mapping used for this CHRMAP, and provides for coastal foreshore reserves and public open space. Moore River South is not an area addressed by this CHRMAP.

2.8.4 Local Planning Policies

Under the provisions of LPS 9 local planning policies can be developed to affect the type of developments permissible within the designated zones/reserves of LPS 9. These provisions are outlined in Division 2 of Part 2 of the Regulations. The Shire have several local planning policies relevant to development of coastal land, including two adopted on 15 January 2013:

- Local Planning Policy 1.2 Foreshore Protection Areas (LPP1.2), and
- Local Planning Policy 1.4 Foreshore Reserves along Water Courses (LPP1.4)

Additionally, while not addressing coastal development, Local Planning Policy 1.3 *Interim Position on Seabird Coastal Erosion*, is general policy regarding the management and monitoring of coastal erosion at Seabird.

2.8.5 Local Planning Horizons

Local planning schemes require a review every five years to ensure the scheme remains current with respect to current issues, trends and policy and the strategy context. Local planning strategies, which provide the broader planning direction within which the local planning scheme operates, typically have a planning horizon of 10 to 15 years. The CHRMAP establishes strategy for adapting to sea level rise and coastal erosion over the next 100 years at a range of time scales from short term (next 5-10 years), medium term (10 to 40 years) and long term (40 to 100 years).

As development itself has a much longer horizon, coastal hazard assessment uses a 100-year horizon. Therefore, when assessments indicate zoned land may be impacted by coastal processes within the next hundred years (even if the likelihood of the hazard having an impact may be beyond the horizon of current planning instruments, including LPS 9) local government has a responsibility to the future community to direct new development away from high risk areas.

2.9 Risk Assessment Inputs

To effectively assess the risks and plan for the future management of the coastal zone, as illustrated in Figure 2-9, information is needed on:

- > Present and predicted future coastal hazards;
- > Existing assets, their value and lifecycles; and
- > Community and stakeholder values.

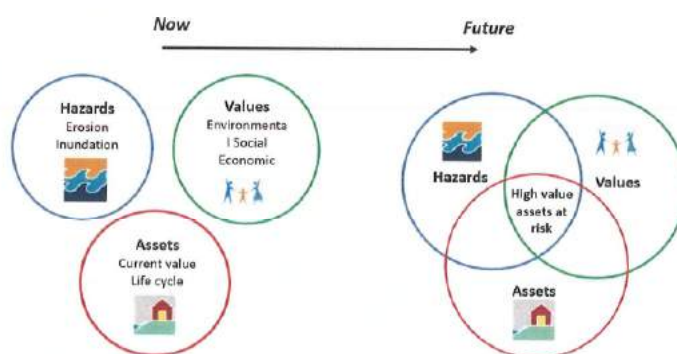


Figure 2-9 Conceptual relationship between key inputs to the coastal risk assessment process



The changing interrelationship between these components over time is the key to defining the priorities for future adaptation planning.

2.9.1 Hazards in each Management Unit

SPP2.6 Schedule One, outlines the methodology for defining appropriate physical processes allowances, to ensure the use of coastal land accounts for coastal hazards over the next 100 years. Calculation of these allowances is based on a pragmatic approach to characterising coastal processes and includes four elements: storm erosion from a potential one in 100 year storm event (S1), historical erosion trends (S2) and predicted sea level rise (S3), and an allowance for uncertainty.

Coastal hazard assessments were undertaken for Seabird (MRA, 2016a) and Ledge Point, Lancelin (and Cervantes) (MRA, 2016b). The assessments were reviewed and accepted for adaptation planning purposes by the WA Department of Transport and are available at the Shire's website. In accordance with SPP2.6, coastal erosion hazard lines have been collated for the present day (2016), 2030, 2070 and 2110 planning timeframes. The hazard maps are presented in **Appendix A**. A summary of the hazard assessment assumptions and calculated erosion allowances are presented in **Table 2-3** for each management unit. Erosion allowances and horizontal shoreline datum (HSD) were taken directly from the relevant coastal hazard report (MRA, 2016a and 2016b).

Table 2-3 Coastal processes erosion allowance for present day and predicted conditions

Management Unit	HSD (m AHD)	S1 Erosion Allowance (m)	S2 Erosion Allowance (m/year)	Total Erosion Allowance (m)			
				Present-day (2016)	2030	2070	2110
Seabird [*]							
SE1	+2.0	15 - 21	0.4 – 1.2%	15 - 21	15 - 46	16 - 50	21 - 55
SE2	+1.8	33	0.35 – 0.5	33	49 - 52	105 - 114	181 - 196
Ledge Point [#]							
LP1	+1.6	19	0	19	29	69	128
LP2	+1.6	12 – 19	0	12 - 19	22 - 29	62 - 69	121 – 128
LP3	+1.6	12 – 24	0	12 - 24	22 - 34	62 - 74	121 – 133
LP4	+1.6	24	0	24	34	74	133
Lancelin [#]							
LA1	+1.4	14 – 22	0.3 – 3.3	14 - 22	37 - 82	89 - 134	160 – 205
LA2	+1.4	11 – 14	0 – 3.3 [^]	11 - 14	18 - 74	50 - 126	101 – 197
LA3	+1.4	11 – 30	0 – 2.3	11 - 30	18 - 75	50 - 131	101 - 202
LA4	+1.4	30	0.2 – 2.3	30	43 - 75	93 - 131	161 - 202

* Values for Seabird are taken from MRA (2016a)

[#] Values for Ledge Point and Lancelin are taken from MRA (2016b)

[^] All but the southern boundary of this management area has an S2 erosion allowance of 0 m/year

[%] The application of the S2 erosion allowance in this area is complicated by the presence of rock. Refer to MRA (2016a) for details.

2.9.2 Assets

As introduced in **Section 1.3.5**, assets include both natural and built features of coastal areas. Assets at risk of coastal erosion were identified by overlaying the hazard lines on aerial photomaps of each township. Residential property boundaries were drawn from Council's GIS cadastral layers, while all other assets were based on interpretation of aerial images only. A site visit was conducted to confirm asset classifications. Information on the assets at risk, existing coastal erosion controls and planning context/controls are provided for each management unit in **Appendix C**.



2.9.3 Values

The estimated value of assets has been derived, in the first instance, from their economic value or replacement cost. This economic value can be easily estimated for physical infrastructure and property, but not always for natural assets that provide a range of values and services. It is clear that the community and visitors to the Shire place a high value on the natural coastal assets and foreshore amenities in each town. These values have been expressed on numerous occasions in the past through formal public consultations with the Shire, such as during the development of local planning documents and through feedback on development proposals. In establishing the values of assets and coastal areas for risk assessment, this social and environmental value has been fully considered, alongside economic value.

A summary of the values associated with assets at risk is provided for each management unit in **Appendix C**.



3 COASTAL HAZARD RISK ASSESSMENT

3.1 Risk Assessment Framework

To provide a transparent and logical basis for determining adaptation planning priorities, a risk assessment was undertaken based on the Australian Standard guideline *Climate change adaptation for settlements and infrastructure – A risk based approach* (AS5334-2013), and the CHRMAP guidelines (WAPC, 2014a). As illustrated in **Figure 3-1**, risk was assessed in relation to likelihood, consequence and adaptive capacity. Likelihood was assigned using the results of the hazard assessments (MRA, 2016a and 2016b) and consequence ratings were informed by public consultation. Risk is considered to be the combination of likelihood and consequence, with consideration of adaptive capacity determining an asset's, or group of assets', overall vulnerability to climate change (as defined previously in **Section 1.3.6**).

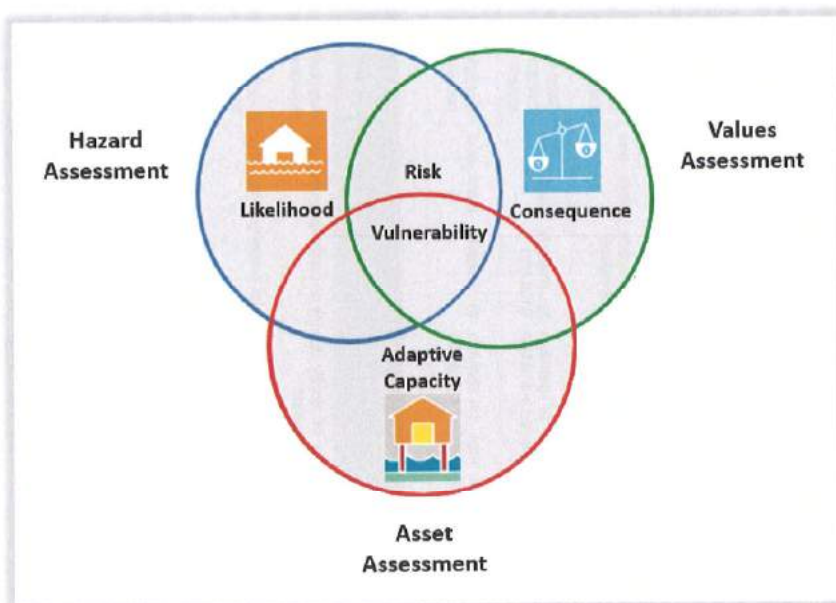


Figure 3-1 Conceptual relationship between risk assessment elements

Consequence and adaptive capacity criteria used in this assessment are presented in **Table 3-1**. A full description of the risk assessment process is provided in **Appendix D**. Summary tables of the assigned likelihood, consequence and adaptive capacity ratings, as well as the resultant risk and vulnerability profiles over time are provided in **Appendix E** for assets within each management unit.



Table 3-1 Risk and adaptive capacity criteria used in the risk assessment

Consequence			
Scale	Safety and Social	Economic	Environment and Heritage
Catastrophic	Loss of life and serious injury. Large long-term or permanent loss of services, public access/amenity, employment, wellbeing or culture. No suitable alternative sites exist within the LGA.	Permanent and/or entire loss or damage to property, plant and equipment, finances >\$10 million	Permanent loss of flora, fauna, conservation or heritage area (no chance of recovery).
Major	Serious injury. Medium term disruption to services, public access/amenity, employment, wellbeing or culture. Very limited suitable alternative sites exist within the LGA.	Permanent and/or large scale loss or damage to property, plant and equipment, finances > \$2 - \$10 million	Long-term and/or large scale loss of flora, fauna, conservation or heritage area (limited chance of recovery) with local impact.
Moderate	Minor injury. Major short term or minor long-term disruption to services, public access/amenity, employment, wellbeing or culture. Limited suitable alternative sites exist within the LGA.	Permanent loss or damage to property, plant and equipment, finances > \$100,000 - \$2 million	Medium-term and/or medium scale loss of flora, fauna, conservation or heritage area (recovery likely) with local impact.
Minor	Small to medium disruption to services, public access/amenity, employment, wellbeing or culture. Many suitable alternative sites exist within the LGA.	Permanent loss or damage to property, plant and equipment, finances > \$10,000 - \$100,000	Short-term and/or small scale loss of flora, fauna, conservation or heritage area (strong recovery) with local impact.
Insignificant	Minimal short term inconveniences to services, public access/amenity, employment, wellbeing or culture. Many suitable alternative sites exist within the LGA.	Permanent loss or damage to property, plant and equipment, finances < \$10,000	Negligible to no loss of flora, fauna, conservation or heritage area (strong recovery) with local impact.

Adaptive Capacity			
Scale	Physical / Engineering	Economic	Social and Environmental
Low	Little or no adaptive capacity. Potential impact would destroy all functionality. Not possible to relocate asset.	Cost to relocate or modify design of property, plant and equipment >\$10 million	Adaptation would significantly damage or negate current environmental and or social values
Moderate	Small amount of adaptive capacity. Difficult but possible to restore functionality through repair, redesign or relocation.	Cost to relocate or modify design of property, plant and equipment > \$2 - \$10 million	Limited natural adaptive capacity. Current environmental / social values would be negatively impacted.
High	Decent adaptive capacity. Functionality can be restored, although additional adaptive measures should still be considered. Natural adaptive capacity restored slowly over time under average conditions.	Cost to relocate or modify design of property, plant and equipment > \$100,000 - \$2 million	Current environmental / social values may be affected. Natural adaptive capacity restored over time under average conditions.
Very High	Good adaptive capacity. Functionality restored easily by repair, redesign or relocation.	Cost to relocate or modify design of property, plant and equipment > \$10,000 - \$100,000	Adaptation has little or no impact on current environmental and or social values.
Insignificant	Potential impact has insignificant effect on asset. Controls are re-established naturally or with ease before more damage would likely occur.	Cost to relocate or modify design of property, plant and equipment < \$10,000	Adaptation may improve current environmental and or social values.



3.2 Risk Assessment Outcomes

The outcomes of the risk assessment for each management unit are discussed in the sub-sections below. The inputs to the risk assessment and the tabulated outcomes of the risk assessment process are presented in **Appendix E**.

3.2.1 SE1 - Seabird South

The Seabird South management unit extends along 1400 m of coastline and the southern half fronts undeveloped land. The management unit contains 22 residential properties in the northern half that are fully or partly located seaward of the 2110 coastal hazard line, as well as a number of roads, carparks and public assets (**Figure 3-2**). There is a lack of foreshore reserve width to facilitate public amenity and beach access along the section of coast adjacent to the township. To the south of the township, natural assets comprising the beach and vegetated dunes are not bounded by development. **Appendix C** provides more information on the assets and their values in this management unit.



Figure 3-2 Photograph of the Seabird seawall during construction in the SE1 management unit (source, watoday.com.au)

A limestone ridge lying beneath the dunes and extending along the majority of this management unit forms a significant existing control on potential future erosion. This ridge has been considered in the coastal hazard assessment (MRA, 2016a) and this current risk assessment process. The seawall, constructed in 2016 (subsequent to the Coastal Hazard Assessment, MRA 2016a) and extending along the northern half of the management unit, forms another control on future erosion of the coast. Scattered offshore and nearshore reefs also influence current and future sediment transport and accretion/erosion of the coast within this management unit. The presence of the limestone ridge acts a barrier to erosion and limits the inland extent of the 2110 hazard line to less than 50 m width for the majority of the management unit. At the northern end the limestone ridge dips lower and the coastline has been classified as sandy for the purpose of coastal hazard assessment (MRA, 2016a). At the northern end the 2110 coastal hazard line extends to about 200m inland (see **Appendix A** and **Table 2-3**).

Residential properties in the northern portion of the management unit have been deemed very highly vulnerable at present, due to their value and proximity to potential coastal erosion hazards. It must be noted that a seawall is currently in place protecting these properties, which should prevent them from being impacted for the duration of its assessed 20-year design life. However, responsibility for maintaining the seawall is still uncertain, and the possibility of it being removed if responsibility cannot be allocated must be considered. Other built assets, such as carparks and roads, have a medium vulnerability at present increasing to high by 2030. Natural assets, such as the beach and coastal dunes/vegetation, have increasing vulnerability ratings across the planning timeframes, becoming very highly vulnerable by 2050. The adaptive capacity of these assets diminishes over time as they are restricted by existing development, particularly in the northern portion of the site (see **Appendix E**). The key outcomes of the risk assessment for management unit SE1 are:



- > Residential properties have a very high vulnerability rating at present;
- > Carparks and roads in the management unit have a medium vulnerability at present, increasing to a high vulnerability rating by 2030; and
- > The beach has a high vulnerability rating by 2030 and both the beach and coastal dunes/vegetation have very high vulnerability ratings by 2050.

3.2.2 **SE2 - Seabird North**

This Seabird North management unit contains the Seabird Tavern, a number of roads, carparks and public assets and the strata titled caravan park (Figure 3-3). The width of the 2110 coastal hazard line is typically 190 m for the 1200m of coastline the above assets are all partially or fully located seaward of the 2110 hazard line. As with SE1, there is a lack of foreshore dune width to facilitate public amenity and beach access along the, roughly 400m section of coast adjacent to the township. To the north of the township, the coast fronts natural assets comprising the beach and vegetated dunes and there is no development within the 2110 hazard line. See **Appendix C** for more information on assets and their values in this management unit.



Figure 3-3 Photograph of the northern section of the Seabird town site SE2 (source: DoT, 2016)

Scattered offshore and nearshore reefs, and visible beach rock along the shore form existing controls that might affect future erosion within this management unit and which have been considered in the risk assessment process. The coastal hazard assessment (MRA, 2016a) treated the coast as sandy and coastal hazard lines advance steadily landward over the planning timeframes (see **Appendix A** and **Table 2-3**).

The caravan park (Seabird Private) in the southern portion of the management unit has an increasing vulnerability over time, becoming high by 2050 and very high by 2070. Natural assets, such as the beach and coastal dunes/vegetation, have increasing vulnerability ratings across the planning timeframes, becoming highly vulnerable by 2050. The adaptive capacity of these assets in front of the town diminishes over time as they are restricted by existing development, particularly adjacent to the caravan park. The tavern has increasing vulnerability over time as the risk of erosion increases, becoming highly vulnerable by 2070 (see **Appendix E**). The key outcomes of the risk assessment for this management unit, SE2, are:

- > The caravan park has a high vulnerability rating by 2050 and a very high vulnerability rating by 2070;
- > The beach and coastal dunes/vegetation have medium vulnerability ratings by 2030 and high vulnerability ratings by 2050; and
- > The tavern has a high vulnerability rating by 2070.

3.2.3 **LP1 - Ledge Point South of Township**

The Ledge Point South of Township management unit contains predominantly natural assets such as the beach and vegetated dunes (Figure 3-4). There are unsealed roads and an unsealed coastal carpark lying seaward of the 2110 coastal hazard line and the values of these assets are described in **Appendix C**.

The coastal hazard assessment treated this coastline as sandy (MRA, 2016b) and the hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of approximately 130 m.



Figure 3-4 Photograph of the Ledge Point South of Township LP1 management unit (source: DoT, 2016)

Although the current beach and vegetated dune system is likely to be eroded over time, this dunal ecosystem extends over broad areas of the coast and hence the consequence of future erosion within this management unit is considered insignificant to minor. The adaptive capacity of these natural assets is also considered high through their ability to migrate inland. The risk profile and vulnerability of natural assets in this area are therefore low to medium across the planning timeframes. The medium to high rating for coastal dunes/vegetation towards the end of the century is based on the assumption that inland migration of the dune habitat is likely, but it is not certain that all ecological functions will be retained. The vulnerability of unsealed roads and carparks is generally low across the planning timeframes, due primarily to their low value (see **Appendix E**) and ability to be relocated. The key outcomes of the risk assessment for this management unit, LP1 are:

- > The beach has a low vulnerability rating across the planning timeframes and the coastal dunes/vegetation have a low vulnerability rating to 2030, medium vulnerability rating by 2070 and high vulnerability rating by 2110; and
- > The beach carpark and road have low vulnerability ratings up to 2070.

3.2.4 **LP2 - Ledge Point Township South**

The Ledge Point Township South management unit has about 600 m of ocean front and contains beach and foreshore reserve, 33 residential properties, roads and associated public infrastructure that are located either partially or fully within the 2110 coastal hazard line (**Figure 3-5**). The natural beach and vegetated foreshore reserve is bounded on the landward side by residential development. A small recreational area at the northern end of the management unit is located seaward of the 2070 hazard line. The values of these assets are described in **Appendix C**.



Figure 3-5 Ledge Point Township South LP2 management unit (source: DoT, 2016)

The groyne and headland feature at the northern boundary of the management unit and the scattered nearshore and offshore reefs structures form existing controls to sediment transport and erosion. The coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of approximately 130 m.

Residential properties in the management unit are highly vulnerable at present and predicted to be very highly vulnerable by 2030, due to their value and proximity to potential coastal erosion hazards. Roads associated with these properties have high vulnerability by 2070. Natural assets, such as the beach and



foreshore recreation area, have increasing vulnerability ratings across the planning timeframes, becoming highly vulnerable by 2070. The adaptive capacity of these assets diminishes over time as their ability to adapt is restricted by existing development (see **Appendix E**). The key outcomes of the risk assessment for this management unit, LP2 are:

- > Residential properties have a high vulnerability rating at present and a very high vulnerability rating by 2030;
- > Roads have a high vulnerability rating by 2070; and
- > The beach and foreshore recreation area have medium vulnerability ratings by 2030 and high vulnerability ratings by 2070.

3.2.5 **LP3 - Ledge Point Township North**

The Ledge Point Township North management unit contains a mixture of residential and commercial properties (i.e. the Holiday Village), as well as roads and carparks, located either partially or fully seaward of the 2110 coastal hazard line (**Figure 3-6**). This foreshore area contains the town's main swimming and recreation beach. A large portion of coastal land is allocated for recreation use and tourism, including Key Biscayne Park, beach access paths and car parking at De Burgh Street. The values of these assets are highlighted in **Appendix C**.



Figure 3-6 Ledge Point Township North LP3 management unit (source: DoT, 2016)

Two groynes: one at the southern boundary and one located slightly south of the centre of the management unit shoreline form important controls for coastal erosion. The coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of approximately 130 m.

Residential properties and the Holiday Village are predicted to be very highly vulnerable by 2070 as the risk of coastal erosion increases. All other built and natural assets are predicted to have medium vulnerability by 2070 and high or very high vulnerability by 2110 (see **Appendix E**). The key outcomes of the risk assessment for this management unit, LP3 are:

- > Residential properties have a very high vulnerability rating by 2070;
- > The Holiday Village has a high vulnerability rating by 2070 and very high vulnerability rating by 2110; and
- > All other assets have medium vulnerability ratings by 2070 and high or very high vulnerability ratings by 2110.

3.2.6 **LP4 - Ledge Point North of Township**

The Ledge Point North of Township management unit contains predominantly natural assets with the beach and vegetated dunes as well as unsealed tracks and a sailing club (reportedly at the end of its lifecycle) lying seaward of the 2110 coastal hazard line (**Figure 3-7**). The values ascribed to these assets are provided in **Appendix C**.



Figure 3-7 Ledge Point North of Township LP4 management unit (source: DoT, 2016)

There are some scattered nearshore and offshore reef structures but the coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of approximately 130 m

Although the current beach and vegetated dune system is likely to be eroded over time, this dunal ecosystem extends over broad areas of the coast and hence the consequence of future erosion within this management unit is considered insignificant to minor. The adaptive capacity of these natural assets is also considered high through their ability to migrate inland. The risk profile and vulnerability of natural assets in this area are therefore low to medium across the planning timeframes. The medium to high rating for coastal dunes/vegetation towards the end of the century is based on the assumption that inland migration of the dune habitat is likely, but it is not certain that all ecological functions will be retained. The vulnerability of unsealed roads and carparks is generally low across the planning timeframes, due primarily to their low value (see **Appendix E**) and ability to be relocated. The key outcome of the risk assessment for this management unit, LP4 is:

- > All assets within the management unit have low vulnerability ratings across the planning timeframes.

3.2.7 LA1 - Lancelin South of Township

The Lancelin South of Township management unit contains predominantly natural assets such as the beach and vegetated dunes. The northern part of the management unit contains a caravan park and Grace Darling recreation that lie partially or wholly, respectively, seaward of the 2110 coastal hazard line (**Figure 3-8**). The values of assets are described in **Appendix C**.

Scattered nearshore reef, Edward Island and the Edward Island Point headland towards the northern end of the management unit form controls on the sediment transport and erosion processes considered in the risk assessment process. The coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of varying from 160 to 200 m.



Figure 3-8 Lancelin South of Township LA1 management unit (source: DoT, 2016)

Grace Darling Park and the Sea Rescue building have been assessed as highly vulnerable at present, and very highly vulnerable by 2030 and 2070, respectively. This is due to the current and increasing risk of erosion impacts, because of their proximity to the coast. The caravan park is seen to have a medium vulnerability at present, becoming highly vulnerable by 2070. The beach and coastal dunes/vegetation have



been assessed as having low vulnerability across the planning timeframes, due to their ability to adapt to ongoing erosion impacts (see **Appendix E**). The key outcomes of the risk assessment for management unit LA1 are:

- > Grace Darling Park has a high vulnerability rating at present and a very high vulnerability rating by 2030;
- > The Sea Rescue building has a high vulnerability rating at present and a very high vulnerability rating by 2070; and
- > The beach, coastal dunes/vegetation and Back Beach Carpark have low vulnerability ratings across the planning timeframes.

3.2.8 **LA2 - Lancelin Township South**

The Lancelin Township South management unit contains roads, 53 residential properties and associated public infrastructure that are located either partially or fully within the 2110 coastal hazard line (**Figure 3-9**). The natural beach and foreshore reserve are bounded on the landward side by public infrastructure and residential development. Commercial assets include a Lobster receival depot and restaurant at the northern end. The values of these assets are highlighted in **Appendix C**.



Figure 3-9 Lancelin Township South LA2 management unit (source: DoT, 2016)

Extensive nearshore reefs form existing controls within this management unit and have been considered in the risk assessment process. The coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of varying from 100 to 200 m.

Commercial assets in the light industrial area at the northern end are seen as having medium vulnerability at present and are predicted to be highly vulnerable by 2070, due to their value and proximity to coastal erosion hazards. Residential properties and the associated road are predicted to be highly vulnerable by 2070 and 2110, respectively. The beach and coastal dunes/vegetation are predicted to become highly vulnerable by 2070, as coastal erosion risk increases and their ability to adapt diminishes, due mainly to development restricting inland migration (see **Appendix E**). The key outcomes of the risk assessment for this management unit, LA2 are:

- > The light industrial area and Café have medium vulnerability ratings at present and have high vulnerability ratings by 2070;
- > The beach and coastal dunes/vegetation have low vulnerability ratings at present and high vulnerability ratings by 2070; and
- > Residential properties have high vulnerability ratings by 2070 and very high vulnerability ratings by 2110.

3.2.9 **LA3 - Lancelin Township North**

The Lancelin Township North management unit contains 41 residential properties, roads and associated public infrastructure located partially or fully within the 2110 coastal hazard line (**Figure 3-10**). The beach and coastal dunes/vegetation are bounded to various extents on the landward side by public infrastructure and residential development. Commercial assets include the Endeavour Tavern, the Lancelin Beach Hotel and a caravan park at the northern end. A foreshore recreation area and a small portion of the Primary School also lie seaward of the 2110 coastal hazard line. The values of assets are described in **Appendix C**.



Figure 3-10 Lancelin Township North LA3 management unit (source: DoT, 2016)

Extensive nearshore reefs, Lancelin Island offshore the northern boundary and the Lancelin Island Point headland at the northern boundary form existing controls to future erosion considered in the risk assessment process. The coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of varying from 100 to 200 m.

Due to the value of residential properties in this management unit and the increasing risk of coastal erosion impacts, the assets are predicted to be highly vulnerable by 2030 and very highly vulnerable by 2070. The beach and coastal dunes/vegetation have increasing vulnerability across the planning timeframes as their ability to adapt is restricted by development on their landward side. These natural assets are predicted to be highly vulnerable by 2070. Other valuable assets, such as the Caravan Park, Lancelin Beach Hotel, park and Endeavour Tavern are predicted to be highly vulnerable by 2070, as the risk of coastal erosion impacting them becomes high (see **Appendix E**). The key outcomes of the risk assessment for this management unit LA3 are:

- > Residential properties have a high vulnerability rating by 2030 and very high vulnerability rating by 2070;
- > The beach and coastal dunes/vegetation have high vulnerability ratings by 2070 and very high vulnerability ratings by 2110; and
- > The Caravan Park, Lancelin Beach Hotel, park and Endeavour Tavern have high vulnerability ratings by 2070.

3.2.10 **LA4 - Lancelin North of Township**

The Lancelin North of Township management unit contains 40 residential properties that are located partially or fully within the 2110 coastal hazard line, as well as roads and associated public infrastructure (**Figure 3-11**). Natural assets include the beach and foreshore reserve, which are well used for recreation near Lancelin Island Point. The beach and dunes are bounded inland by development in the southern portion of the management unit, but unbounded to the north. See **Appendix C** for more information on assets and their values in this management unit.



Figure 3-11 Lancelin North of Township LA4 management unit (source: DoT, 2016)

Nearshore reefs, Lancelin Island offshore the southern boundary and the Lancelin Island Point headland at the southern boundary form existing controls considered in the risk assessment process. The coastal hazard assessment treated this coastline as sandy (MRA 2016b) and the estimated hazard lines advance steadily landward (see **Appendix A** and **Table 2-3**) to the 2110 width of varying from 160 to 200 m.



The beach and coastal vegetation/dunes are predicted to be increasingly vulnerable into the future, particularly in the south of the management unit where their ability to migrate inland is restricted by existing development. These natural assets are predicted to become very highly vulnerable by 2070. Residential properties at the south of the management unit are predicted to be highly vulnerable by 2030 and very highly vulnerable by 2070, as the risk of erosion increases across planning timeframes. Existing beach access is predicted to be highly vulnerable by 2070. The key outcomes of the risk assessment for this management unit, LA4 are:

- > Residential properties have a high vulnerability rating by 2030 and very high vulnerability rating by 2070;
- > The beach and coastal dunes/vegetation have very high vulnerability ratings by 2070; and
- > Beach access ways have a high vulnerability rating by 2070.

3.3 Management Units for Priority Consideration of future Options

The risk assessment process has resulted in predictions of vulnerabilities for the assets within each management unit at the three townships, discussed in the preceding sections.

Management units containing assets assessed as having 'High' or 'Very High' present day vulnerability and/or 'Very High' vulnerability by 2030 have been identified to take priority when developing adaptation options for the current CHRMAP process. The priority management units identified include:

- > SE1: Seabird Township South (Residential (houses and land));
- > LP2: Ledge Point Township South (Residential (houses and land)); and
- > LA1: Lancelin South of Township (Grace Darling Park and Sea Rescue building).



4 PLANNING CONTROLS

The risk assessment process highlighted the key areas vulnerable to coastal erosion over the next decade to 2030 as well the longer term vulnerability to 2070 and 2110. The Shires Local Planning Strategy requires that development within the coastal zone follow the requirements of the SPP2.6 and the WAPC (2014a) guidelines for development of a CHRMAP that effectively focuses on two time scales:

- the long term strategic pathway over the next 100 years, and
- planning for implementation of management actions in the shorter term, the next decade, for priority management units.

As discussed in **Section 2.8** and in greater detail in **Appendix H** there exists a complex set of documents and rules that have influenced the evolution of the Shire's coastal townships. Historically, it was assumed that cadastral boundaries enclosed reasonably permanent areas suitable for developing residential and commercial assets ad-indefinitum. The notion that the land and assets within these boundaries is now subject to erosion and potentially becomes unusable triggered the establishment of SPP2.6 and the need for careful planning to determine future develop directions of coastal townships.

The essential aim of SPP2.6 is to recognise that SLR and coastal erosion are threatening, currently fixed, coastal zone assets at an increasing rate into the future and to commence the process of adjusting community expectations about life in the future, diminishing coastal zone. Preliminary estimates of protecting property and beach amenity across the State into the future are prohibitively expensive and hence the SPP2.6 policy aims to implement responsible long term planning strategies to develop affordable solutions that satisfy a range of key drivers including intergenerational equity.

As per SPP2.6 and WAPC (2014a) guidelines, and recent *draft Planned or Managed Retreat Guidelines* (DoPLH, 2017c) the long term priority is to adopt a strategy hierarchy of:

- *Avoid*;
- *Managed Retreat*;
- *Accommodate*; and, as a last resort
- *Protect* (to be funded under the beneficiary pays principle).

Ultimately, the aim of SPP2.6 is to manage retreat from vulnerable areas before assets are threatened. This will require a shift in the strategy from, for example, initially protect to managed retreat. The *Protect* strategy proposes that protection be funded by the beneficiaries while the transition from a *Protect* to *Retreat* strategy may trigger funding for removal or relocation under the LAA. The LAA empowers the Minister for Lands to take interests in land on behalf of the State or any "acquiring authority". An "acquiring authority" may include a local government. A number of issues arise out of these strategies, for example;

- Who are the beneficiaries?
- What is a reasonable method for apportioning costs to the beneficiaries?
- Who is responsible for funding managed retreat, in accordance with the mechanisms described in the *draft Planned or Managed Retreat Guideline*?

It is recommended that a comprehensive investigation of each township community and visitors be undertaken to identify beneficiaries of the proposed protection areas. Further, an economic assessment of mechanisms for recouping costs from beneficiaries (e.g. parking fees, visitor entry fee, increased council rates or levy and other options) is required to inform the future review of the strategy options outlined in this CHRMAP.

The following planning framework is similar to that outlined in the *draft Planned or Managed Retreat Guideline*, is to be adopted for this CHRMAP and can be modified as clarity around financial implications of options and funding arrangements evolve. This planning framework includes the following instruments and considerations:

Special Control Area (SCA), to ensure discretion over development proposed in hazard areas. The SCA will show on the scheme map, as required by the Planning and Development (Local Planning Schemes) Regulations 2015 (WA), Schedule 1, Part 5.



Notifications on Title, to inform current and future landholders of coastal hazard risk, as recommended by State Planning Policy 2.6: State Coastal Planning Policy (SPP2.6).

Time Limited Planning Consent Conditions, to allow where appropriate, the temporary use of land in hazard areas until hazards materialise, while ensuring that Councils maintain a level of discretion over development in these areas. Time limits would be identified using coastal hazard mapping projections. If the consent expires before hazards materialise, the proponent may apply for an extension to the consent. If hazards materialise before the time limit expires, Council will consider requiring the demolition or removal of compromised structures under relevant legislative provisions (predominantly the LAA).

Interim Coastal Protection, where development is proposed behind a protection structure, the design life of the protection structure would determine the time limit permitted on planning consents. Maintenance and capital costs of protection are to be funded by the beneficiaries of protection works. Protection would only be considered as a last resort where all other options have been considered, as per SPP2.6.

Assessment Criteria, to ensure consistency when assessing applications for development proposed in hazard areas, for inclusion into a Local Planning Policy.

Development applications for subdivision and zoning beyond existing scheme allowances, are not encouraged and will generally not be approved.

Ultimately the aim of the CHRMAP is to plan for adaption to the effects of rising sea levels and coastal erosion. The general strategy shifts that are likely to be required in future, as assets currently situated in the eroding coastal zone become unviable, is outlined in **Figure 4.1**.

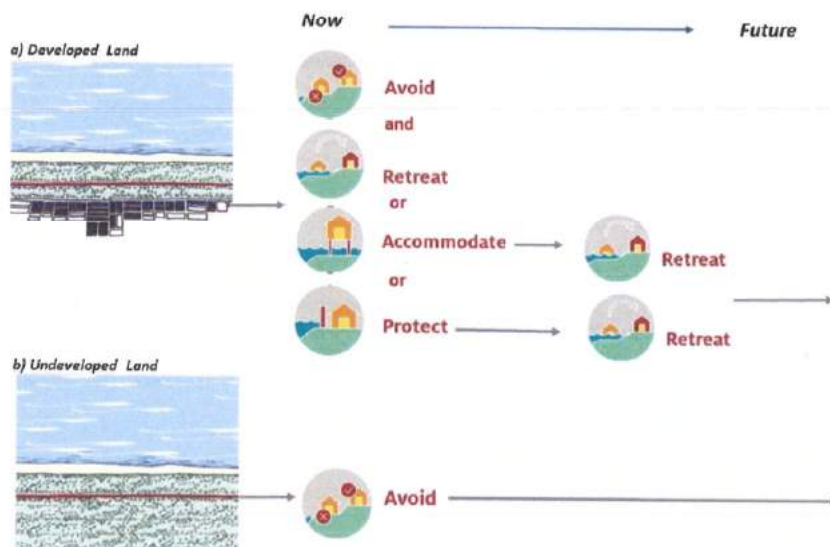


Figure 4-1 Long-term pathways for a) developed and b) undeveloped land

From a practical perspective implementation of managed retreat as suggested in the recent *draft Planned or Managed Retreat Guidelines* (DoPLH, 2017c) would require the State or Commonwealth to provide the majority of funding to acquire property likely to be required under the compensation provisions of the LAA and/or PDA. Clearly, there is no obligation to adopt a policy that effectively forces government to compensate. The general public and landowners should be aware of the risks in any decisions they make about purchasing or developing lands in these coastal areas. The potential financial burden of a Managed Retreat policy are more likely to see Local Government adopt an 'Avoid' or 'Do Nothing' policy that



effectively shifts the burden of costs of sea level rise and coastal erosion impacts to landowners and beach users.

The Planning Framework outlined above recognises the complexity of the issues surrounding the adaptation to sea level rise and coastal erosion. The framework:

- allows for the continued use of hazard areas,
- allows landholders to propose development to suit their own needs and recognise the future risks,
- limits future hazard and liability risk to the Shire and State government,
- considers the limited public funding available,
- largely accords with SPP2.6 Policy and Guidelines and the Planning & Development Regulations 2015, and
- is cognisant of community feedback and other local governments.



5 ADAPTATION OPTIONS

5.1 Adaptation Options Overview

Effective adaptation planning involves the identification, development and evaluation of options suitable to manage the risk of coastal hazards. Adaptation options were evaluated in relation to each of the management units, with multiple options identified as potentially suitable for implementation within each unit. For the longer term, strategic planning options are discussed while options for the 3 priority managements units are considered in more detail.

In accordance with SPP2.6 and the CHRMAP guidelines (WAPC, 2014a), potential options have been identified under the risk management categories of 'Avoid', 'Managed retreat', 'Accommodate' and 'Protect' (Table 5-1). Note that the government has no obligation to protect private assets from coastal erosion and hence the Protect management category is deemed the least preferred option for implementation, as recommended by the guidelines (see Flowchart below, adapted from CoastAdapt, 2017). The range of adaptation and management options were based on WA's CHRMAP guidelines (WAPC, 2014a) and are described in Table 5-1.

'Avoid' is seen as the preferred strategy but is generally only applicable to undeveloped coastal land and areas of the coast where intensification of development in hazardous areas might be proposed. This option is underpinned by the implementation of planning controls, which should prevent inappropriate use of land in areas identified as potentially at risk from coastal hazards.

'Managed retreat' is a preferred long term strategy for areas of existing development at risk. This option aims to remove assets from the risk of coastal hazards and is economically responsible over the long term, although it may involve significant expenditure during implementation. The planning mechanisms around implementing 'avoid' and 'managed retreat options' have been discussed in Section 4.



'Accommodate' options aim to re-design existing infrastructure to mitigate potential impacts as they occur, and allow for land use of a low risk (for example temporary) nature. This option is rarely applicable to areas, at risk of coastal erosion but is suitable to some areas prone to coastal inundation, where assets can be elevated above flooding to maintain land use in a designated hazard area. The ability for substantial, built assets to be redesigned to accommodate coastal erosion hazards is generally limited.

'Protect' options range from temporary 'soft' protection, such as sand nourishment, to semi-permanent 'hard' protection options, such as groynes and seawalls. It should be noted that no protection option is considered permanent, and all have associated ongoing expense to implement or maintain. This ongoing expense and the inability of protection options to permanently mitigate the risks associated with coastal hazards are the primary reasons why these options are considered the least favourable in the preferential planning hierarchy. Hard protection options also have the potential to divert coastal erosion hazards elsewhere, increasing risk for adjacent areas or assets and potentially creating liability for those responsible for the structures.

SPP2.6 Clause (5.5 (iii)) states that the employment of protection options should be sought only where:

"sufficient justification can be provided for not avoiding the use or development of land that is at risk from coastal hazards and accommodation measures alone cannot adequately address the risks from coastal hazards, then coastal Protection works may be proposed for areas where



there is a need to preserve the foreshore reserve, public access and public safety, property and infrastructure that is not expendable."

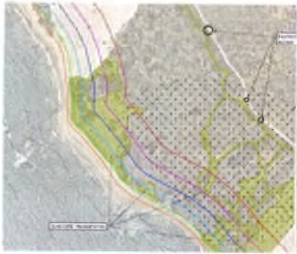





Table 5-1 Adaptation and Management Options (adapted from WAPC, 2014a)

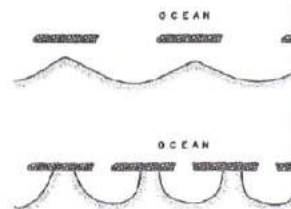
Option Category	Option Name	Option Code	Description
Avoid	Avoid development	AV	Avoidance of freehold residential or commercial development within the coastal foreshore reserve.
Managed Retreat	Leave unprotected / repair	MR1	Assets are left unprotected and loss is accepted following hazard event. Repairs may be implemented to extend life and for public safety in the short term. In the case of natural assets, such as beaches and vegetation, allow the impacts of hazards to occur.
	Remove / relocate	MR2	Assets located in the hazard zone are permanently removed or relocated. For residential and commercial property, this option may require voluntary or compulsory acquisition of land, transferrable development rights and land swaps.
	Planning controls for Managed Retreat	MR3	Use of planning controls to allow continued use of the current infrastructure until such time that impacts arise, but restrict the development of further infrastructure (densification) as the area/asset is known to be vulnerable. This option also includes mechanisms for ensuring that Local Government, land owners and prospective buyers are made aware of the risk.
Accommodate	Planning controls for accommodation	AC1	Indicates to current and future landholders that an asset is at risk from coastal hazards over the planning timeframe. Helps owners to make informed decisions about the level of risk they are/may be willing to accept and that risk management and adaptation is likely to be required at some stage.
	Emergency plans and controls	AC2	Implement plans for assets/areas that are at risk of coastal erosion. Have procedures in place for before, during and after the events for safety. E.g. signage/barriers to prevent access.
Protect	Dune care / sand management	PR1	Development of a long term program for revegetation and rehabilitation of the dune system. Sand fencing to manage wind-blown erosion also falls under this category (also see Table 5-2).
	Beach nourishment / sand management	PR2	Addition of sand to the beach, dune and/or nearshore area to replace lost material and/or create additional buffer. This option is a temporary measure and can be more effective in association with hard protection options, such as groynes. The sand may be from an external source or from a nearby part of that coastal area (i.e. via sand bypassing or back passing) (also see Table 5-2).
	Groyne	PR3	Construct groynes along the beach to restrict longshore sediment movement and stabilise sections of shoreline. This option is often accompanied by beach nourishment. Hard protection generally diverts erosion issues elsewhere, such as to the down drift side of a groyne, and can have significant impact on coastal ecosystems (also see Table 5-2).
	Nearshore reef / breakwater	PR4	Construct offshore reef(s)/breakwater(s) or raise existing natural nearshore reef structure to maintain level of protection as sea level rises. Hard protection generally diverts erosion issues elsewhere, such as to beaches either side of the nearshore structures, and can have significant impact on coastal ecosystems (also see Table 5-2).
	Seawall	PR5	Construct seawall in front of assets or along length of coastline to protect them from coastal hazards. Hard protection generally diverts erosion issues elsewhere, such as to beaches either side of, and directly in front of, a seawall. They can also have significant impact on coastal ecosystems (also see Table 5-2).
Do nothing	Do nothing	DN	Take no action. No limitations on development or implementation of adaptation planning. Accept risk.



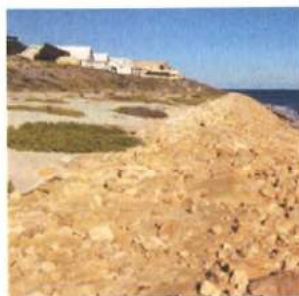
Although protection measures are the least favoured option, particularly as a long-term mitigation measure, they remain the most commonly employed coastal risk mitigation strategy globally. There are several effective protection techniques that can be employed to manage the risks of coastal erosion in the short to medium term. 0 provides additional detail on protection options available.

Table 5-2 Overview of protection options considered in the CHRMAP

a) Dune Care		
		Dune care is a "soft" protection option that is relatively low cost and can assist by stabilising dune systems. It involves actively revegetating dunes or preventing degradation by restricting access, for example with fencing and signage. Dunes form a natural buffer to coastal erosion, which can protect areas and assets located behind them. Dune vegetation helps to prevent wind-blown erosion of dunes and stabilises the dune structure. Dune care is often undertaken by local volunteer groups.
b) Beach Nourishment		
		Beach nourishment is a "soft" protection option that provides temporary protection against coastal erosion. Sand can be sourced from another area of the beach, from an inland source, such as inland dunes or a sand quarry, or from offshore. Nourishment generally involves placement of sand on the upper beach face to act as a buffer during extreme events. Nourishment is often combined with other protection options such as groynes or offshore protection, which enhance its longevity. A nourished beach profile may provide protection for between 18 months and five years, before the beach returns to its original state.
c) Groynes		
		Groynes are "hard" protection options that extend from above the high water mark, across the active shoreline and into the nearshore area. They are usually constructed perpendicular to the beach and can take various shapes such as T or L shapes. They can be constructed of rock, geotextile sand containers, timber or concrete. Groynes act to interrupt alongshore sediment transport which results in a build-up of sand on the up drift side of the groyne and an erosion on the down drift side. Groynes may be constructed as single groynes or in a groyne field to protect a larger area. Groynes have minimal impact on cross-shore sediment transport, such as that associated with storm-based erosion, outside of their immediate vicinity. Groynes are often complimented by additional beach nourishment, to increase the beach width on their up drift side.

**d) Nearshore Reef / Breakwater**

Artificial nearshore reefs or breakwaters are "hard" protection options. They can be constructed of rock, concrete or geotextile sand containers. They function by diverting wave energy either side of the structure, which pushes sediment onto the shore inside of the structure. This results in the formation of a salient or even a tombolo in the lee of the structure, which results in an increase in beach width and an increased buffer against coastal hazards. Nearshore reefs or breakwaters affect both longshore and cross-shore sediment transport but do not fully interrupt either. Their feasibility is often determined by the nearshore water depth and the bottom type. They are generally more expensive to construct (per metre) than groynes, due to deeper water requiring a larger volume of construction material and leading to higher construction costs.

e) Seawall

A seawall is a "hard" protection option, which can be constructed of rock, geotextile sand containers or concrete, and can be either exposed or buried to improve visual amenity. A seawall is a solid barrier constructed parallel to the coast at the land-sea boundary, which functions by acting as a physical barrier to coastal erosion, protecting areas and assets on its landward side. Seawalls can also provide protection against inundation. Seawalls generally focus wave energy in front of them and to their sides, due to reflection off the structure. This usually leads to a more rapid loss of beach in the vicinity of the structure, leading to a "hardened" shoreline with poor useability and public amenity.

5.2 Adaptation Options Assessment Process

Each of the adaptation options presented in **Table 5-1** has been considered for each of the three priority management units identified in the risk assessment for this study. As recommended in the State CHRMAP Guidelines, a multi-criteria analysis has been used as a preliminary step to identify potentially suitable adaptation options for each management unit, as well as to discount unviable options. The analysis uses a broad range of criteria and a simple 'traffic light' rating system to evaluate the acceptability of each option. The assessment considers the effectiveness of options at reducing risk and performing their function in relation to governance, environmental, social and economic aspects. Information gained through the stakeholder and community engagement process has been used to reflect the community in the assessment. Options have also been assessed in terms of their restriction on future planning and risk management opportunities, with options that allow for a wide range of future strategies considered more favourably. The analysis takes into consideration the following criteria:



Preliminary feasibility:

- > Effectiveness;
- > Governance, legal implications and approval risk; and
- > Reversibility / adaptability.

Preliminary acceptability:

- > Environmental and social impact; and
- > Community acceptability.

Preliminary financial implication:

- > Financial gain / avoidance of cost;
- > Capital cost; and
- > Ongoing cost.

The criteria and a description to guide the assignment of a rating for each criteria considered is presented in **Table 5-3**. Ratings have been assigned by taking into account information gathered prior to, and during, the CHRMAP process. This information includes feedback from ongoing stakeholder and community consultation, planning considerations (outlined in **Section 4**), previous investigations of the study areas and the outcomes of the coastal hazard assessments and risk assessment process. The analysis has also been guided by coastal engineering, management and planning expertise, and knowledge of other coastal management projects and techniques.

Based on the ratings assigned under each criteria for a particular adaptation option, a qualitative judgement is then made as to whether that option is recommended, not recommended or requires further investigation. It should be noted that red lights do not necessarily exclude an option, and it still may be recommended that such an option be investigated further. The outcomes of the multi-criteria analysis, for each management unit, are presented and discussed in **Section 5.3**, below.

For priority management units (as defined in **Section 3.3**) those options recommended for further investigation have been assessed in greater detail. This additional detail is discussed for each of priority management unit in **Sections 5.4 to 5.6**, respectively. Recommendations as to whether these options should be implemented and, if so, the details around this implementation are discussed in the Implementation Section (**Section 6**). Recommended options for long term pathways across all management units are also considered in **Section 6**.

**Table 5-3 Multi-criteria assessment and qualitative cost benefit input ratings and assessment outcome categories**

	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Implication			Outcome
	Effectiveness	Governance / Legal / Approval Risk	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Financial Gain / Avoidance of Cost	Capital Cost	Ongoing Cost	Recommendation
Unlikely to be acceptable	Likely to be ineffective	Not likely to be approved / likely to result in legal risk /	Not likely to be reversible. Limits future options once implemented	Likely to have unacceptable negative impacts	Unlikely to meet most success criteria	No financial gain or avoidance of loss	Very expensive	Very expensive	Not Recommended
May be acceptable	May be effective	May not be approved / may present governance or legal risk	Likely to be reversible / adaptable at high costs	Some impacts that can be managed to an acceptable level	Mixed response, may meet some success criteria but not others	Some financial gain / small number of benefactors	Moderately expensive	Moderately expensive	Investigate / detailed option assessment
"No regrets"	Likely to be effective	Likely to be approved / minimal governance or legal risk	Easily reversible or adaptable for the future, no negative impacts in the future	Not likely to have negative impact, may have positive impacts	Likely to meet most acceptability criteria	Large financial gain / public benefit	Low cost	Low cost	Recommended
Not Applicable									



5.3 Multi-criteria Analysis Results

The detailed results of the multi-criteria analysis for each management unit are presented in **Appendix F**, with the final recommendations for each option summarised in tables presented in **Appendix G**. The following subsections discuss the outcomes of the analysis, with respect to the assets and their vulnerabilities, at each town site.

5.3.1 Seabird South (SE1 and SE2)

The outcomes of the multi-criteria analysis are consistent for the two management units within Seabird (SE1 and SE2).

The multi-criteria analysis recommended further investigation of the following options:

- MR2, the process of implementing managed retreat of assets;
- PR3, using groynes as a protection measure; and
- PR5, extending the recently constructed seawall and/or maintaining it beyond its 20-year design life to provide ongoing protection to assets.

The options recommended for implementation in the short term include:

- AV, avoiding further development in identified hazard areas;
- MR3, implementing planning controls to facilitate future managed retreat from these areas;
- AC1, planning controls to accommodate risk;
- AC2, the preparation of emergency plans and controls; and
- PR1, low cost protection options such as dune care and sand management.

An assessment of adaptation options recommended for further investigation is discussed in **Section 5.4** and the implementation plan presented in **Section 6**.

5.3.2 Ledge Point

LP1 and LP4

Ledge Point South of Township (LP1) and Ledge Point North of Township (LP4) management units are characterised by undeveloped natural assets and the outcomes of the multi-criteria analysis are consistent for both management units. It is recommended that substantial residential and commercial development is avoided (AV) in these units. Planning controls (MR3, AC1) are recommended for implementation to prevent inappropriate development. Low cost protection options such as dune care and sand management (PR1) are recommended.

Beach nourishment (PR2) and hard protection options (PR3, PR4 and PR5) have been assessed as expensive and inappropriate with respect to the existing assets and nature of the risk in these management units, so are not recommended.

LP2 and LP3

The outcomes of the multi-criteria analysis are consistent for both this and the Township North management unit (LP3).

Options recommended for further investigation included:

- MR2, the process of implementing managed retreat of assets; and
- PR2, PR5, and PR3, protection options of beach nourishment, groyne(s) and a seawall require further investigation to assess their suitability for implementation.

The options recommended for implementation in the short term include:

- AV, avoiding further development in identified hazard areas;
- MR3, implementing planning controls to facilitate future managed retreat from these areas,



- AC1, planning controls to accommodate risk;
- AC2, the preparation of emergency plans and controls; and
- PR1, low cost protection options such as dune care and sand management.

An assessment of adaptation options recommended for further investigation is discussed in **Section 5.5** and the implementation plan presented in **Section 6**.

5.3.3 Lancelin

Identifying suitable adaptation options and determining an adaptation pathway for the priority management unit at Lancelin South of Township (LA1), is considered urgent. The outcomes of the multi-criteria analysis are consistent among all management units within Lancelin (LA1, LA2, LA3 and LA4).

The multi-criteria analysis recommended further investigation of the following options:

- MR2, the process of implementing managed retreat of assets;
- PR2, beach nourishment; and
- PR3 and PR5, groynes and a seawall, respectively, require further investigation to assess their suitability and cost (initial capital and ongoing maintenance costs).

The options recommended for implementation in the short term include:

- AV, avoiding further development in identified hazard areas;
- MR3, implementing planning controls to facilitate future managed retreat from these areas;
- AC1, planning controls to accommodate risk;
- AC2, the preparation of emergency plans and controls; and
- PR1, low cost protection options such as dune care and sand management.

An assessment of adaptation options recommended for further investigation is discussed in **Section 5.6**, for LA1 and the implementation plan presented in **Section 6**.

5.4 **Adaptation Options – Seabird Township South (SE1)**

The coastal hazard assessment (MRA, 2016a) was undertaken prior to construction of the recently constructed seawall. The present day and 2030 coastal hazard extents should be reassessed during the next round of review of the CHRMAP, particularly for the area adjacent to the seawall. This risk assessment and multi-criteria analysis processes, however, have considered the protective structure.

The current seawall was installed as a temporary protection device while the broad range of issues on the management of the coastal zone are considered and implemented at some point in future. The seawall was not designed as a permanent solution and it is likely that it will fail under extreme events at some point in the future. If this was to occur, the presence of the limestone ridge is likely to reduce the risk of erosion landward of McCormick Street as shown by the hazard map (**Appendix A**) but properties seaward of McCormick St would be affected.

The coastal hazard risk to built assets has been mitigated for the short term (up to ca. 2030) by the construction of the seawall. This seawall has, however, impacted (and is likely to continue to impact) the adjacent beach to the north of the seawall, the public amenity and associated coastal access. The long term tenure and management arrangements for the seawall are still undecided and continue to be the subject of discussions between the State and the Shire. Planning for management of this area should consider the following:

- > Tenure of land and management responsibility;
- > Design life of the current seawall (estimated to be 20 years);
- > Economic value of assets at risk from coastal processes / benefiting from the seawall;
- > Investigation of medium to long term adaptation options:
 - managed retreat (MR2);



- groyne(s) (PR3);
- seawall extension and/or maintenance (PR5); and

> Equity implications and sources of funding.

Government has no legal responsibility to protect this area but in the recent past the State provided funding for the seawall. Potential funding sources, including private property owners, the State or the Shire will need to be carefully considered during the investigation of solutions to this issue.

5.4.1 Land Tenure and Seawall Management

The Seabird seawall was constructed on Shire road reserve (the portion of Turner St that previously existed in front of some of the houses) and unvested (or unallocated) Crown land (UCL) on the seaward side of the road reserve. Management of the UCL is the responsibility of the Department of Planning, Lands and Heritage.

The seawall is currently being managed by the Shire of Gingin under a license issued under section 91 of the LAA by the Department of Lands. The license authorises temporary use to other parties. The Licence has been extended for 3 years to 2020; however, this arrangement is not considered to be a long term management solution. Tenure of the land, and therefore management responsibility for the seawall, should be transferred to the Shire for ongoing control, monitoring and maintenance of the structure until a long term solution is considered during the CHRMAP review process in 5 to 10 years.

5.4.2 Value of Assets at Risk

An estimate of the economic value (2015 \$) of built assets lying seaward of the 2030 coastal hazard line is presented in **Table 5-4** (draft CHRMAP, Shire of Gingin 2016b). The value of assets protected by the seawall at the 2030 planning timeframe is around \$8M. To provide context for subsequent discussion of the application of a beneficiary pays system to fund future coastal management the Shire's revenue base, in 2105 dollars, for the 15-year period (2015 to 2030) is also estimated in **Table 5-4**. The Shire's current revenue is allocated to a broad range of Council activities across the Shire. The current budget does not include provision for current or future allocation of funds to address coastal management issues nor respond to coastal erosion events.

Table 5-4 Summary of estimated value (2015 \$) of vulnerable built assets in the Seabird Township South management unit (from draft CHRMAP, Shire of Gingin, 2016b)

Asset type	unit	Rate(\$)	2030	
			#	value (\$)
Roads (main)	m	800	0	0
Roads (secondary)	m	500	174.7	\$ 87,350
Footpaths / Cycleways / Beach Access	m	350	123.5	\$ 43,225
Carpark	m ²	70	1150	\$ 80,500
Private properties: residential				
- land vacant	#	250,000	0	\$ 4,000,000
- houses and improvements	#	250,000	16	\$ 4,000,000
Private properties: commercial, holiday accommodation				
- land	m ²	150	0	0
- improvements (chalets)	#	180,000	0	0
Total				\$ 8,211,075
Rate Base Revenue over 15 years, 2015 to 2030 (in 2015 \$)				
Affected properties	#	\$997	16	\$239,280
Township	#	\$997	140	\$2,093,700
Shire	#	\$997	1273	\$19,037,715

* includes S2



The Shire is reliant upon the State for emergency response assistance and limited funding of ongoing coastal projects through the State's coastal program which is subject to competitive bidding process. Options for increasing equitable enjoyment of the ocean frontage aspect enjoyed by properties positioned above the seawall, for example rezoning of some areas to allow for commercial use may also be considered.

5.4.3 **Remove and Relocate (MR2)**

There are currently no specific mechanisms for implementing government funded managed retreat in the CHRMAP context. Further, government has no legal obligation to maintain property or access. Noting that the State funded the seawall construction its present maintenance arrangements (eg., to maintain its structural integrity as a protection for hinterland property against extreme erosion events) are subject to negotiation between the Shire and the State. Under the present arrangements the likely scenario is that as extreme events erode the shoreline and private assets, access to properties in SE1 would be prohibited as they become unsafe and/or illegal to occupy. The mechanism to implement a managed retreat policy including legal and financial/economic considerations as well as agreement on the future of the seawall, its costs (maintenance or removal) and its role in ongoing protection needs further investigation. For example, the development of a managed retreat policy that seeks to invoke the provisions of the LAA or the PDA, regarding voluntary or compulsory acquisition, will need to carefully consider the cost implications and apportionment of costs prior to adopting such an approach.

Triggers for retreat might include:

- > Distance of the asset from the HSD datum is less than S1 (noting that this has not been recalculated to include the presence of the seawall);
- > Loss of legal access to property; or
- > Loss of essential services

R_SE1.1: It is recommended that a comprehensive economic study, including detailed economic analysis and proposed costs apportionment to identified beneficiaries, be undertaken by the Shire and the State to guide eventual managed retreat from hazardous areas.

5.4.4 **Groynes (PR2)**

A groyne, or groynes, could be considered as part of a future protection strategy for assets at risk in this management unit. Given that an existing protection measure is already in place (seawall (PR5)) and expected to provide protection for at least the next 20 years, a detailed assessment of the suitability of a groyne(s) for this area is not required in the immediate term.

Groynes could be implemented as a protection measure after the seawall has reached the end of its lifecycle. Material from the seawall could potentially be used in the construction of the groynes, reducing supply and transport costs. Installing groynes in addition to the existing seawall, as some community members have suggested, would not be recommended at this time. The presence of the seawall would reduce the effectiveness of groynes in retaining sediment and stabilising the shoreline in the area.

It should be noted that the installation of groynes, beyond the lifecycle of the seawall, would not be expected to provide protection for all existing assets. A loss of functionality (or the removal) of the seawall would likely trigger a need for managed retreat of multiple residential properties, due to a high risk of impact from coastal hazards. Installing groynes could help restore the useable beach, which has been eroded in front of the seawall, and provide temporary protection for some built assets.

MRA (2015) undertook a preliminary assessment of the feasibility and cost implications for protecting vulnerable assets using groynes up to 2030, prior to the construction of the seawall. They estimated a total cost of approximately \$14 million, the majority of this being associated with initial and ongoing sand nourishment required in addition to the groynes. The cost of implementing this protection measure for a 15-year period (for example) beyond the lifecycle of the seawall is likely to have similar cost implications to this amount. The benefit of implementing this management strategy should be assessed in detail, alongside the expected benefit it will provide, prior to the end of the seawall's lifecycle. The equitable apportionment of costs among beneficiaries of such an option would also require a detailed assessment to justify its viability for the Shire.



R_SE1.2: It is recommended that the feasibility and suitability of groynes be assessed in detail, prior to the end of the seawall's lifecycle (presently estimated to be 2035). It is not recommended that groynes be considered for implementation as a management strategy in the immediate term.

5.4.5 **Seawall Maintenance (PR5)**

A "temporary" seawall has been implemented in this management unit, to provide protection to residential properties (particularly in the northern part of this unit) that would otherwise highly vulnerable to coastal erosion hazards. The design life of the structure is estimated to be 20 years, meaning the protection measure is expected to be in place until at least 2035. Land tenure and management responsibility associated with the seawall is discussed in **Section 5.4.2**. Ongoing seawall monitoring and maintenance costs need to be considered, and these are likely to be between \$100,000 and \$300,000 per decade.

The acceptability of the seawall to the community should also be monitored over the lifecycle of the structure and results reported as part of future reviews (each 5-10 years) of the CHRMAP. Feedback from community engagement associated with this CHRMAP has indicated that some community members are concerned with the loss of beach amenity and its accessibility caused by the seawall. Observations during a site visit in February of this year showed the beach in front of the seawall had receded, giving it limited accessibility and useability. Should this current and potentially ongoing, loss of public amenity be deemed unacceptable to the overall community, with respect to the benefit provided by the seawall, removal of the seawall before the end of its lifecycle (also see **Section 5.4.4**) could be triggered.

R_SE1.3: It is recommended that the seawall is monitored and maintained for the duration of its (estimated) 20 year design life, provided the consequences of its presence are acceptable to the overall community throughout this period. An assessment should be made prior to (approximately) 2035 to decide how this area should be managed beyond this timeframe. Options may include:

- > Continue monitoring, maintaining and retrofit (if required) the seawall to extend its useful life;
- > Completely remove the seawall (and by implication either manage retreat or do nothing and allow eventual abandonment);
- > Remove the seawall and use material (if appropriate) to implement groynes as a protection measure (see **Section 5.4.4**); and
- > Leave the seawall in place, discontinue monitoring and maintenance and allow it to deteriorate in future (do nothing and allow future abandonment).

It must be noted that depending upon the policy position adopted by the Shire the last three options are likely to trigger either abandonment (Do Nothing), or managed retreat of some assets that are presently behind the seawall (see **Section 5.4.4**), or a Protection policy. The cost and viability implications of adopting either these policy positions requires detailed assessment to inform optimal decision. The associated costs of maintaining the wall and equitable apportionment of these costs to beneficiaries creates a difficult issue for the Shire and the community that also needs to be considered as part of an investigation.



Figure 5-1 Photographs of the Seabird seawall taken during a site visit in February 2017



5.5 Adaptation Options – Ledge Point Township South (LP2)

There are 33 residential properties lying seaward of the 2110 coastal hazard line in this management unit, with six properties intersected by the present day hazard line (**Appendix A**). The economic value associated with these properties has led to their high vulnerability rating at present, meaning immediate implementation of adaptation measures is required. Examination of Landgate cadastral information indicates that some property boundaries extend seaward of the current vegetation line. Public access along top of the dunes across private property is possible, due to a lack of property boundary fencing, but there is no allocated public foreshore reserve and direct public access to the beach is limited.

The beach in this management unit is well used, particularly with vehicles accessing the beach and launching vessels from the shore. The preservation of this public amenity should be considered when assessing the suitability of adaptation options.

As described in **Section 2.3**, there are two rock groynes, one at the northern boundary of the management unit and one approximately 250 metres north of this. Historical aerial imagery suggests that, since their construction in the 1970s groynes have been effective in retaining sediment in the area. Recent aerial imagery suggests the groynes have become saturated with beach sand. It is important to note that the groyne structures themselves do not provide a protective function. Generally, the additional sediment they trap provides a greater buffer against coastal erosion impacts. Note, however, that trapping sediment that is part of a longshore transport system exacerbates the beach erosion down-stream (to the north) of the groyne. **Figure 5-2**, below, illustrates how a sediment buffer can be eroded during storm activity.

Preliminary plans by the Department of Transport for a boat ramp/marina to the south of the Ledge Point township are currently being considered. Assessing the potential impacts of such a development is beyond the scope of this CHRMAP project.

R_LP2.1: It is recommended that the planning of the boat ramp/marina consider the short term implementation plan and long term management pathways for Ledge Point articulated in this CHRMAP. Similarly, the Shire should carefully review any plans for such a development with respect to the outcomes of this CHRMAP.



Figure 5-2 Photo monitoring images (NACC 2017) from LP2 showing erosion following storm events in September 2009 (left) and redevelopment and revegetation of dune slope by June 2016 (right).

5.5.1 Value of Assets at Risk

An estimate of the economic value (2015 \$) of built assets lying seaward of the 2030 coastal hazard line is presented in **Table 5-5** (draft CHRMAP, Shire of Gingin, 2016b). Note that this table only includes assets in LP2 impacted by 2030. The apportionment of costs on a beneficiary pays principle suggests that there needs to be significant assessment of the beneficiaries and the value each derives from retaining the beach.



5.5.2 **Remove and Relocate (MR2)**

Removal of properties at risk of erosion to the west of DeBurgh Street is an option in LP2.

There are currently no specific mechanisms for government funded managed retreat in the CHRMAP context, however voluntary or compulsory acquisition may be implemented under the provisions of the LAA or the PDA (See **Section 4.1**).

It is reasonable to assume that triggers for retreat might include:

- > distance of the asset from a datum such as the HSD is less than a yet to be determined set distance (for example 40 m);
- > distance of the asset from the HSD is less than S1 (i.e. 12 m for LP2);
- > Loss of legal access to property, or
- > Loss of essential services.

Since the distance of the assets from the HSD is around 20 m for most of the seafront properties in this area, the need for retreat in relation to S1 would not yet be triggered, however this could change in a single storm event.

In the event of voluntary or compulsory acquisition of the affected property, the total cost (assuming a future valuation of the property would be similar to its present estimated value) presented in **Table 5-5**, is estimated at about \$250,000.

Table 5-5 Summary of estimated value (2015 \$) of vulnerable built assets in Ledge Point (from draft CHRMAP, Shire of Gingin, 2016b)

Asset type	2030*			
	unit	Rate(\$)	#	value (\$)
Roads (main)	m	800	0	0
Roads (secondary)	m	500	0	\$0
Footpaths / Cycleways / Beach Access	m	350	66	\$23,100
Carpark	m ²	70	0	\$0
Private properties: residential				
- land vacant	#	250,000	0	\$0
- houses and improvements	#	250,000	1	\$250,000
Private properties: commercial				
- land	m ²	150	0	0
- improvements (chalets)	#	180,000	0	0
Total				\$523,100
Rate Base Revenue over 15 years, 2015 to 2030 (in 2015 \$)				
Affected properties	#	\$997	33	\$493,515
Township	#	\$997	379	\$5,667,945
Shire	#	\$997	1273	\$19,037,715

* all assets impacted by 2030 are located in LP2

5.5.3 **Beach Nourishment (PR2)**

Beach nourishment should aim to increase the profile of dunes at the back of a beach, providing additional buffer against storm-based erosion to protect assets inland. It is generally more effective when used amongst groynes, which help to retain the sediment in situ. Beach nourishment is a temporary protection measure that can provide additional buffer to areas inland for varying lengths of time, depending on the rate of ongoing nourishment and severity of storm event erosion. This variability makes it difficult to assess the predicted benefit of nourishment, with respect to the cost.



Sand nourishment could be used in front of vulnerable assets to provide additional protective buffer against coastal hazards and to help maintain the useable beach width and amenity in this area. The longevity of such nourishment would probably be assisted by the presence of an existing groyne at the north of the study area. Refurbishment and/or extension of this groyne (discussed below in **Section 5.5.5**) would also be likely to improve the effectiveness of any sand nourishment.

MRA (2015) suggested an initial nourishment volume of approximately 40,000 m³ for this area. The cost of such nourishment could range from approximately \$400,000 to \$2 million, depending primarily on the location of the sand source. A rough assumption would be that this nourishment provides additional protection to the area for a period of 18 months to 5 years, before the beach returns to its original state and additional nourishment is required to continue the protection technique. As nourishment sand is redistributed (offshore and alongshore) subsequent to its placement, the level of protection of areas behind the beach diminishes and progressively exposes these assets to severe storm events.

R_LP2.2: Beach nourishment would be recommended for this area if funding is available and can be allocated. Such funding could be sought from the 33 residential property owners who stand to benefit from beach nourishment. Should it wish to pursue this option, it is recommended that the Shire identify a suitable sediment source and refine a cost per cubic metre, to extract, transport and place material from this source. An affordable volume of nourishment can then be assessed and an appropriate beach profile can be designed to guide sand placement.

5.5.4 **Groynes (PR3)**

An existing groyne is in place at the northern boundary of this management unit. The installation of this groyne in the 70s was effective in reconfiguring and stabilising the shoreline to the south. The groyne now appears to be saturated and is unlikely to provide additional protection beyond this point in time. The effective use of groynes in the area previously suggests that this protection technique could continue to be used effectively into the future. A variety of groyne placements could be considered, including refurbishing existing groynes and installing up to two new groynes.



Figure 5-3 Existing rock groyne at northern boundary of the Ledge Point Township South management unit

In the immediate term, as a first stage, it is recommended that a detailed investigation of the sediment transport processes and sediment budget of the past 50 years be carried out to inform the selection of appropriate groyne/sand nourishment options. Pending the outcome of such an investigation, it may be recommended that the existing groyne at the northern boundary of the management unit be refurbished and extended seaward (see **Figure 5-3**). The cost of designing and constructing the extended groyne is likely to cost \$1-2 million. Monitoring and maintenance costs for the groyne are likely to be in the order of \$50,000 to \$150,000 per decade. A typical rock groyne structure would be expected to have a design life of 35 to 50 years.



Extending this groyne would help retain additional sediment (as additional protective buffer) on the beach in front of residential properties at the northern end of the management unit. The assets in this area have the highest vulnerability to coastal hazards at present. Extending the groyne would be more effective if associated with initial and ongoing beach nourishment, similar to that described in **Section 5.5.4** (also see **Figure 5-3**).

Partial or full funding for the protection works should be sought from the 33 residential property owners who stand to benefit from the management strategy.

It must be noted that the extension of this groyne is likely to exacerbate seasonal erosion to its north. The full extent of this erosion is difficult to predict. The additional management measures, and their costs, that may be required to the north of this management unit should be properly considered before this management technique is adopted.



Figure 5-4 Conceptual representation of existing groyne refurbishment and extension, with sand nourishment and potential locations for future groynes

Beyond this first stage, the installation of additional groynes could be considered to provide protection for assets further to the south of this management unit, as their vulnerability increases (**Figure 5-4**). MRA (2015) assessed an option to install two additional groynes in the management unit. They estimated the construction of groynes and associated beach nourishment, providing protection for 15 years, would cost approximately \$4 million. The suitability of installing additional groynes can be investigated at a later stage, and should be based on ongoing beach monitoring in the short term and also the performance on the first stage groyne extension, should that option be implemented.

5.5.5 Seawall (PR5)

A seawall could be considered as a protection measure in this area and has been investigated previously by MRA (2015) who estimated the cost to install a seawall at approximately \$1.2 million. The concept location is shown in **Figure 5-5**. They noted that the approach and costing was of a preliminary nature and that detailed design would need to be carried out based on site specific data and further, the potential impacts on the amenity of the beach and potential to increase erosion in adjoining areas would need to be investigated. Ongoing maintenance of the rock seawall would cost approximately \$130,000 per decade.

The above costings are also representative of "best practice" for a long term structure design and more cost effective options may be adequate for medium term protection of assets in LP2.



Figure 5-5 Conceptual representation of seawall

5.6 Adaptation Options - Lancelin South of Township (LA1)

The key asset at risk in management unit LA1 is Grace Darling Park (Figure 5-6). This is a grassed recreation area and is a very popular spot for both tourists and locals. It offers sheltered, shallow waters with some protection from southerly winds, and the grass is used as a rigging area for kite and windsurfers. Built infrastructure includes a Sea Rescue Building, an ablution block and picnic facilities. The erosion of the park has generated considerable concern in the community, and raised local awareness of coastal erosion threats to adjacent residential areas.

There is some conjecture that the grassed nature of the area has contributed to localised erosion, however this is unsubstantiated. It is more likely that the localised erosion is due to wave energy and currents formed due to the presence of Edward Island (see Section 5.6.3). The grassed area is slightly elevated in relation to the natural dunes to the north, which may be significant in relation to coastal inundation in later revisions of the CHRMAP.

Inland from Grace Darling Park is the Lancelin South Caravan Park (hereafter referred to as the caravan park) which is vested in the Shire. Hazard lines also intersect parts of the leased area, including some on-site infrastructure and semi-permanent structures. Lease arrangements for new management of the caravan park are currently close to finalisation. The new lessees are required to provide a plan demonstrating how coastal hazards will be managed and public foreshore reserve will be maintained over time.

In previous years, short-term management of erosion has been carried out through nourishment. The beach was renourished by placing sand in front of the erosion scarp in November 2014 and May 2015 (Seashore Engineering, 2015). It is understood sand was sourced locally from Aglime Australia's lime sand pit, with a bobcat used to distribute sand in front of the erosion scarp. A portion of this material was lost rapidly. It is also understood that some opportunistic renourishment has occurred in recent years when sand from dredging operations carried out by DoT at the town jetty became available.

The Lancelin coastal zone is predominantly low lying, and coastal inundation will be a major factor that needs to be carefully assessed during the next stage of adaptation planning.

R_LA1.1: It is therefore recommended that major investment decisions with regards to coastal infrastructure are reserved until after the coastal inundation impact assessment mitigation planning has been completed.

Draft Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin

Figure 5-6 Grace Darling Park a) during a storm event (May 2015) and b) February 2017

5.6.1 Value of Assets at Risk

An estimate of the economic value (2015 \$) of built assets lying seaward of the coastal hazard lines for each planning timeframe is presented in **Table 5-4** (draft CHRMAP, Shire of Gingin, 2016b). Note that this table only includes assets in LA1 impacted by 2030. The apportionment of costs on a beneficiary pays principle suggests that there needs to be significant assessment of the beneficiaries and the value each derives from the retaining the beach and park. Note that this table encompasses all management units in Ledge Point, however for 2030 only assets in LA1 are impacted.

Table 5-6 Summary of estimated value (2015 \$) of vulnerable built assets in Lancelin (from draft CHRMAP, Shire of Gingin, 2016b)

Asset type	unit	Rate(\$)	2030*	
			#	value (\$)
Roads (main)	m	800	111	\$88,800
Roads (secondary)	m	500	150	\$75,000
Footpaths / Cycleways / Beach Access	m	350	755	\$26,4250
Carpark	m ²	70	3676	\$25,7320
Private properties: residential				
- land vacant	#	250,000	1	\$25,0000
- houses and improvements	#	250,000	0	0
Private properties: commercial				
- land	m ²	150	0	0
- improvements (chalets)	#	180,000	16	\$2,880,000
Total				\$3,815,370
Rate Base Revenue over 15 years, 2015 to 2030 (in 2015 \$)				
Affected properties	#	\$997	0	\$0
Township	#	\$997	754	\$11,276,070
Shire	#	\$997	1273	\$19,037,715

* all assets impacted by 2030 are located in LA1

It is important to note that the primary values of Grace Darling Park are of a social nature, and may not be captured by the above cost estimates. The current assessment has not placed an economic value on the natural assets of the beach and the social aspects of the grassed area, however for cost benefit analyses in relation to specific proposals, these factors would need to be included to produce a holistic assessment. In particular, the area has tourism benefits with flow on economic benefit to local businesses.



5.6.2 Remove and Relocate (MR2)

Removal of infrastructure and allowing natural erosion to occur is an option for management unit LA1. Grace Darling Park is vested in the Shire (foreshore Parks and Recreation Reserve – see **Appendix C**) and its long term plan is to remove and relocate the facilities following severe erosion. In the interim ongoing repairs for minor damage following storm events is likely to continue until repairs are no longer viable. For the caravan park, mechanisms for retreat will be provided upon assessment of a development application for the site.

It is reasonable to assume that triggers for retreat might include:

- > distance of the asset from a datum such as the Horizontal Shoreline Datum (HSD) is less than a yet to be determined set distance (for example 40 m); or
- > distance of the asset from the HSD datum is less than S1 (i.e. 14 m for this part of LA1);
- > Damage repair following storm event exceeds maintenance budget allocation;
- > Loss of legal access to property; or
- > Loss of essential services.

The distance of built assets from the HSD is greater than 14 m for the built assets in the caravan park, but some of the infrastructure in Grace Darling Park (including the sea rescue building) is currently less than 14 m from the HSD. These structures could therefore be impacted by a single storm event.

R LA1.2: It is recommended that the sea rescue building is removed, however the ablation block and shade structures should remain until unserviceable.

Ongoing provision of a grassed recreation area which has the same appeal as the existing grassed area (including sheltered shallow water and seafront position) is contingent upon land being available which is currently part of the caravan park lease area. The caravan park in turn is constrained from expanding due to the presence of a Threatened Ecological Community (TEC) to the south. Removal of dunes to create a grassed area to the north of the existing park is an option but is likely to be unacceptable due to damage this would cause to dunes that are currently protecting public and private assets. If the toilet facilities are removed from this location, then alternative facilities will need to be built in the vicinity to cater for visitors. These issues will need to be explored further to reach an optimal solution.

5.6.3 Sand Nourishment

A study of potential engineering options for the protection of Grace Darling Park was undertaken by Seashore Engineering in 2015. This report recommended:

"Following conventional coastal practice, and due to the relatively low costs of obtaining sand, the interim management option of sand renourishment appears to be appropriate, albeit likely needing higher volumes of material than has been placed recently. Some improved performance of the renourishment could be achieved by ensuring the use of sand which is as coarse as practically available. It is understood that the most recently used source (from Aglime) is slightly smaller sized than the in situ beach material, which may substantially reduce its retention."

Seashore's (2015) estimated requirement for annual renourishment was 3000 m³, which at \$16/m³ would cost \$48,000 per year.

It is important to note that localised sediment transport at Grace Darling Park may often be from north to south, due to circulation and wave diffraction patterns caused by Edward Island (**Figure 5-7**, from Sanderson and Eliot, 1999). Assuming this model is still largely correct, then an alternative source of sand for renourishment may be the Edward Island salient. Sourcing sand that has previously moved past the Grace Darling Park beach could be considered to be "back passing" – a technique where sediments are routinely moved upstream on the understanding that they will migrate back to the place of origin. This may be a cost effective approach and it is recommended that this be investigated further.

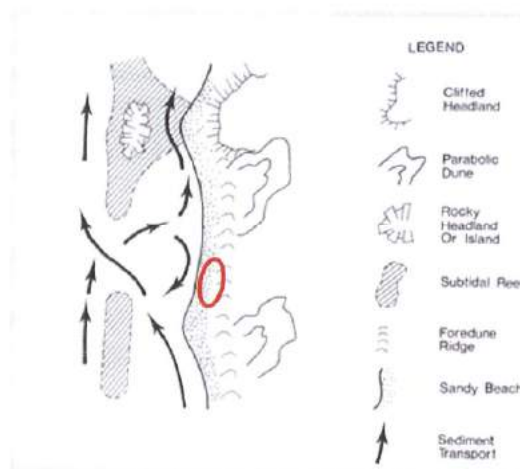


Figure 5-7 Circulation pattern in relation to salient formations from Sanderson and Eliot (1999) and the relative position of Grace Darling Park (red oval)

5.6.4 Accommodate (AC2)

Infrastructure in the caravan park is generally of a relocatable nature and it is therefore better able to accommodate the risk of erosion than other land uses. It is understood that the new managers will be required to prepare a plan for management of coastal hazards, which includes mechanisms for relocation in relation to erosion triggers, and ongoing provision of a public foreshore reserve.

5.6.5 Groynes (PR3)

A preliminary costing of structural protection options for Lancelin was undertaken by MRA in 2015. A best practice approach was adopted and recommended the following components for protection up to 2030:

- > 4 groynes;
- > Additional width of beach profile required: 20 m;
- > Total length of 280 m; and
- > Sand nourishment volume 168,000 m³.

The cost estimate for this option was estimated at \$12M. In addition to the capital cost, ongoing groynes maintenance costs were estimated to be around \$400,000 per decade.

Note this is a preliminary estimate based on concept designs and would require further detailed design and investigation of the impacts on adjoining areas prior to being adopted. The above costings are also representative of "best practice" for a long term design life and it is possible that more cost effective options may be adequate to protect assets in the short term.

It is assumed that the above option aims to protect the caravan park as well as Grace Darling Park. Smaller scale options in the vicinity of Grace Darling Park might cost considerably less than the above amount. Assessment of potential impacts from groynes would require careful investigation due to a range of uncertainties associated with the nature of cusped headlands.

5.6.6 Seawall (PR5)

Preliminary costings, based on concept designs, for construction of a 700 m long rock seawall at Lancelin (Figure 5-8) were estimated at \$2.7M and ongoing maintenance estimated at \$300,000 per decade (MRA, 2015). This preliminary estimate was based on concept designs and would require further detailed design and investigation of the impacts on adjoining areas prior to being adopted.

The above costings are also representative of "best practice" for a long-term design life and more cost effective options may be adequate to protect assets in the short term.

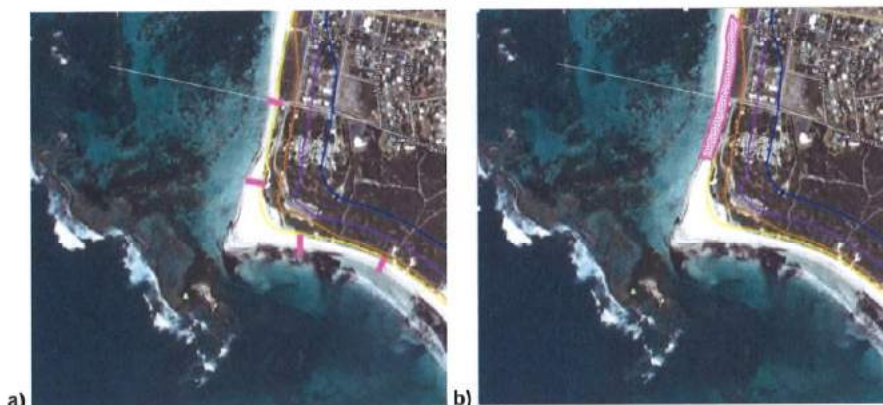


Figure 5-8 Indicative positions of a) new groynes and b) seawall options costed for LA1

Seashore Engineering (2015) carried out an assessment of three additional seawall options for the Grace Darling Park foreshore. These focused on the use of Geotextile Sand Container (GSC) revetments (**Figure 5-9**). Three options were examined which ranged in price from \$710,000 to \$920,000.

A GSC revetment is thought to provide advantages over a rock seawall (for example as constructed at Seabird) due to their lesser visual impact and greater retention of beach amenity however they are less durable and generally have a shorter design life. Seashore Engineering (2015) note that the nature of the GSC revetment is to provide a 'back stop' to acute erosion events, providing protection to existing infrastructure. However, performance of a revetment is likely to be compromised if the rate of progressive erosion observed since 2011 continues.



Figure 5-9 GSC revetment example and conceptual layout from Seashore Engineering (2015)

Regardless of the type, seawalls have the potential to result in negative impacts to surrounding areas, including scour in front of and increased erosion to either side of the structure. In addition, it may hinder beach access and diminish the current amenity of the area.



6 IMPLEMENTATION

A range of options for addressing the challenges of coastal erosion and its effects on the coastal zone over the next decade and century have been outlined in the preceding chapters. While it is natural that local communities would prefer to protect and preserve the current features of the coastal zone, the reality is that unless some new and innovative protection methods are developed, the costs of maintaining current features will likely become prohibitively expensive at some point in the future. The interim nature of protection options needs to be recognised across the community and, the adaption options developed and solutions optimised for social, environmental and economic (affordability) drivers. This section first discusses the issues around funding and equity then addresses the plan for implementation of recommended adaptation options up to the 2030 timeframe with a strategic view of the likely adjustments over the next century, to 2110.

The CHRMAP process recognises the difficult decisions that will need to be made in the near future and the CHRMAP document is intended to be updated each 5 to 10 years or as new information becomes available that may significantly affect the extent of hazards, such as new state sea level rise benchmarks.

6.1 Funding and Equity

In accordance with the CHRMAP guidelines, equity implications are considered with a particular focus on identifying who may benefit and who may be disadvantaged by proposed management options. This then raises the question of who would be expected to bear the cost of implementation.

6.1.1 Seabird SE1

As introduced in **Section 2.2**, the presence of the limestone ridge should protect the majority of the township (excluding the Holiday Park) from coastal erosion for some decades. Along the southern beach the seawall was constructed as an interim measure in 2015/16 to protect the 16 houses deemed under immediate threat of coastal erosion during storm events. As a consequence, the original beach is no longer accessible during high water levels and moderate wave conditions and access to this area has effectively been restricted by the seawall. The beach to the north and south of the seawall remain accessible to the community, albeit with some added inconvenience. The key beneficiaries of the seawall are therefore the 16 property owners immediately behind the seawall. The present values of these ocean front properties (while remaining viable) are likely to be worth significantly more than Seabird properties with limited or no ocean views.

The cost of maintaining the seawall was estimated at \$24,000 p/a (**Section 5.4.5**). Applying the beneficiaries pay principle suggests an annual contribution from the 16 beneficiaries of around \$1,500 each may be sufficient to cover the cost of maintenance. This could be charged in the form of a specified area rate or levy.

The lifecycle of this temporary seawall is assumed to be around 20 years and the cost of building a new seawall is estimated to be around \$2.4 M (2015 \$). This equates to a capital expense of around \$150,000 per property owner when it falls due in about 2035. The State and Shire may consider contributing to this seawall beyond the recent capital outlay but this will need to be explored further. For the longer term, and given current day knowledge of coastal processes and protection measures, the implementation plan aims to exercise either the retreat or avoid option, pending the outcomes of an investigation into the implications of adopting the approach outlined in the draft Guidelines for Planned or Managed Retreat (DoPLH, 2017c).

The likely increase in erosion along SE2 should be monitored into the future and options considered now. While residents behind the seawall are beneficiaries of the structure, owners of property in the Holiday Park may be disadvantaged. An equitable mechanism for determining apportionment of costs to the beneficiaries of the seawall needs to be investigated should the managed retreat option be adopted. Landowners must note, however, that there is no obligation on government to compensate losses associated with shoreline erosion and if adopted, an Avoid or Do Nothing policy position would ultimately lead to abandonment of property.



6.1.2 Ledge Point

In contrast to Seabird, there is no known underlying rock present in the hazard zone at Ledge Point, and the hazard lines reflect the likely future erosion of the sandy coast. Two rows of housing and De Burgh St fall within the 2110 hazard line in LP2 and the southern section of LP3. Should a protect strategy be adopted then the capital cost of around \$2M for the seawall or groynes options may be spread over a larger group of beneficiaries within the local community. If adopted, it is likely that a protect strategy would transition to retreat or do nothing strategy at the end of the design life of the seawall/groynes around 2070, by which point the removal/relocation of De Burgh St and utilities infrastructure would need to be considered.

The complex coastal processes around Ledge Point and its offshore reefs and the general south to north movement of sand between the sediment cells around Ledge Point will need to be monitored to inform the need for sand nourishment in future, within both LP2 and LP3. Both the local community and visitors to the township would benefit from sand nourishment and it is recommended that the mechanisms available to generate revenue from these beneficiaries be investigated.

6.1.3 Lancelin

In the case of Grace Darling Park, the beneficiaries of any protection actions would primarily be the broader community. The protection measures may also have benefits for Cunliffe Street residents, however there may also be negative impacts if the presence of a seawall increases erosion. Ongoing provision of a grassed recreation area which has the same appeal as the existing grassed area (including sheltered shallow water and seafront position) is contingent upon land being available which is currently part of the caravan park lease area. The caravan park in turn is constrained from expanding due to the presence of a Threatened Ecological Community (TEC) to the south. Removal of dunes to create a grassed area to the north of the existing park is an option but is likely to be unacceptable due to damage this would cause to dunes that are currently protecting public and private assets. If the toilet facilities are removed from this location, then alternative facilities will need to be built in the vicinity to cater for visitors. These issues will need to be explored further to reach an optimal solution.

Maintaining the current features of the shoreline will require some form of coastal protection and renourishment in the short to medium term. Alternatively, retreating or relocating the assets to accommodate the rising sea level and ongoing erosion may better be implemented sooner, pending an acceptable outcome of investigations into the cost implications of the managed retreat strategy. The estimated costs for protecting the Park, maintaining beach amenity by constructing groynes and the initial sand nourishment is around \$12M, with ongoing costs of around \$50,000 per annum. This infrastructure would likely last for around 50 years before the retreat option would need to be implemented and decommissioning costs would need to be considered.

It would thus appear reasonable to apportion the costs for maintaining the Park across the local community and visitors to the Park, both of whom benefit, the latter group particularly during summer holidays and at wind and kite surfing events. Funding for such works may be sought from the State Government, or via a levy on the local rate payers and/or fees for non-local visitors to the park. As an example, if the 754 local ratepayers (Table 5-6) were to completely fund the capital cost (\$12M) over a 10 year period then a levy of approximately \$1,600 per annum per rate payer would be required.

6.2 Long Term Pathways and Short Term Implementation

The information collated through the various stages of the CHRMAP process, including outcomes of the risk assessment and subsequent analyses summarised in the preceding sections have been used to define priority actions for implementation by the Shire and other stakeholders. The proposed implementation actions are intended to reduce the risk of coastal hazards in the immediate to short term, with consideration of the long term 100 year planning horizon.

The implementation plan has been structured to group actions in accordance with the WAPC (2014a) adaptation hierarchy. In addition, adaptation responses can be defined as being related to either, planning and development or to engineering actions as discussed by the Planning Institute of Australia's (PIA) National Land Use Planning Guidelines for Disaster Resilient Communities (2015).

The long-term pathway for each management unit is both an input and an output to the adaptation option assessment. For example, in a management unit containing few built assets the long term strategic



pathway is one of avoiding development. By contrast, in areas containing built assets under threat in the long term decisions about when to transition from a protect strategy to a retreat or do nothing strategy need to be made.

It is clear that planning decisions made decades and even centuries in the past, prior to understanding the implications of sea level rise and coastal erosion, are a key contributor to the current situation where assets close to the coast are now at risk. Asset owners need to appreciate past government decisions on property boundaries do not imply an obligation to maintain these areas and that ultimate abandonment of property and assets without any form of compensation is a strategy option that may be considered.

R1 - It is recommended that a comprehensive investigation of each community and visitors be undertaken to identify beneficiaries of proposed protection areas. The investigation should assess the economic stimulus provided by tourism and mechanisms for recouping costs from identified beneficiaries (e.g. parking fees, visitor entry fee, increased council rates or levies, etc.) to inform the future review of strategies and options outlined in this CHRMAP.

In the shorter term, roughly the next decade up to 2030, there are a number of specific recommendations that may be implemented. These range from investigations to provide more detailed analyses to inform balanced decisions, monitoring to assess whether the predicted threats of coastal erosion actually occur, community consultation to better educate the community about the impending threats and need to plan for their eventuality and consequences.

6.3 Triggers

The Draft Guidelines for Planned or Managed Retreat (DoPHL, 2017c) provide a guidance on the appropriate triggers or criteria to commence actioning a particular management response. The guidelines suggest the following:

Planned retreat allows development to remain and be safely used until the coastal hazard risk becomes unacceptable. Initiation of the process to remove at risk development can be controlled by triggers such as:

Trigger 1. Where the most landward part of the Horizontal Shoreline Datum (HSD) is within 40 metres of the most seaward point of a development or structure.

Trigger 2. Where a public road is no longer available or able to provide legal access to the property.

Trigger 3. When water, sewage or electricity to the lot is no longer available as they have been removed/ decommissioned by the relevant authority due to coastal hazards.

The trigger distance determines when planned retreat is activated for a particular development.

For the specific sites within The Shire the criterion outlined in Trigger 1 has already been exceeded. Triggers 2 and 3 are relevant to sections of management units SE1, SE2, LP2, LP3, LA2 and LA4 where public roads and potentially utilities services are located seaward of the 2110 Hazard line, but landward of the 2070 hazard line. Given that the projected risk to these assets is half a century away, and there appear to be more pressing issues in the shorter term, it is prudent to adopt a set of triggers based on the immediate term recommendations and around the HSD shoreline movement criteria. For the purpose of this CHRMAP the following triggers have been adopted and applied to each management unit (**Appendix I**):

Trigger 1: CHRMAP recommendation

Trigger 2: HSD plus S1 reaches 2030 vulnerability line

Trigger 3: HSD plus S1 reaches 2070 vulnerability line

In the above triggers it is assumed that the HSD line will be determined annually or at least soon after major storm erosion events to inform the ongoing assessment of the Trigger criteria. Hazard line estimates for interim planning horizons at 2050 and 2090 have also been generated. Finer temporal resolution of the triggers may be implemented using these lines during future revision of the CHRMAP, each 5-10 years. At this time it is important to agree the concepts and implementation process before getting too detailed on the trigger values.



Specific long term pathways and short term implementation recommendations for the priority management units are discussed in the following sections.

6.4 Seabird

6.4.1 Long Term Pathway

The long term pathway for the Seabird Township should aim for the eventual managed retreat of built infrastructure, as it becomes vulnerable to coastal hazards and/or interferes with the maintenance of an appropriate coastal foreshore reserve (as defined in Section 5.9 of SPP2.6). For major infrastructure, such as residential property, this retreat should occur when the risk to infrastructure becomes intolerable and it is no longer viable or acceptable to the Shire's community to implement protection measures. For undeveloped areas, the long term pathway should focus on avoiding inappropriate development, to prevent unnecessary future cost and potential liability for the Shire.

Proposed long term pathways for the individual Management Units within Seabird (SE1 and SE2) are provided in **Appendix I**. The key tools that will underpin the achievement of these long term pathways are planning controls, which were discussed in **Section 4**. There is currently an interim protection mechanism (seawall) in place for a large portion of Seabird's coastline. The transition from this protection approach to one of managed retreat or do nothing will need to be carefully considered in line with the draft Guidelines for Planned or Managed Retreat (DoPHL, 2017c) and guided by appropriate triggers for the transition.

6.4.2 Short Term Implementation – Seabird Township South (SE1)

The following adaptation pathway is proposed:

Short to Medium term: Protect for life cycle of the current seawall; investigate the land tenure and future management arrangements for the seawall; investigate the mechanism for planned retreat of the affected properties; and Implement Planning changes to avoid future development in currently undeveloped areas.

Recommendations arising from the above assessment for SE1 are provided in **Table 6-1**.

Table 6-1 Recommendations and adaptation planning recommendations for SE1

ID	Recommendation
R_SE1.1	The Shire and State to undertake comprehensive study, including detailed economic analysis and proposed costs apportionment to identified beneficiaries, to guide eventual retreat from or abandonment of assets in hazardous areas. This needs to assess managed retreat versus a do nothing and ultimate abandonment strategy.
R_SE1.2	The feasibility and suitability of groynes be assessed in detail, prior to the end of the seawall's lifecycle (presently estimated to be 2035). It is not recommended that groynes be considered for implementation as a management strategy in the immediate term.
R_SE1.3	<p>The seawall be monitored and maintained for the duration of its (estimated) 20 year design life, provided the consequences of its presence are acceptable to the overall community throughout this period. An assessment should be made prior to (approximately) 2035 to decide how this area should be managed beyond this timeframe. Options may include:</p> <ul style="list-style-type: none"> > Continue monitoring, maintaining and retrofit (if required) the seawall to extend its useful life; > Completely remove the seawall; > Remove the seawall and use material (if appropriate) to implement groynes as a protection measure; and > Leave the seawall in place but discontinue monitoring and maintenance. <p>It must be noted that the last three options are may to trigger managed retreat of some assets that are presently behind the seawall. The implications of triggering managed retreat should be assessed in detail to understand the implications of selecting one of these management options. The associated costs of maintaining the wall and equitable apportionment of these costs to the beneficiaries creates a difficult issue for the Shire and the community that also requires further investigation.</p>



R_SE1.4	Long term tenure arrangements and management responsibility for the seawall should be established through negotiated agreement between the State and the Shire.
R_SE1.5	Options for increasing equitable enjoyment of the ocean frontage aspect enjoyed by properties positioned above the seawall, for example rezoning of some areas to allow for commercial use, should be investigated.
R_SE1.6	Undertake annual beach surveys to monitor the change in beach profile
R_SE1.7	Investigate current and future sediment budget in the Secondary Cells to inform likely future nourishment and protection options assessment

6.5 Ledge Point

6.5.1 Long Term Pathway

The long term pathway for the Ledge Point Township should aim for the eventual retreat of built infrastructure, as it becomes vulnerable to coastal hazards and/or interferes with the maintenance of an appropriate coastal foreshore reserve (as defined in Section 5.9 of SPP2.6). For major infrastructure, such as residential property, retreat should occur when the risk to infrastructure becomes intolerable and it is no longer viable or acceptable to the Shire's community to implement protection measures. The long term pathway for undeveloped areas, particularly LP1 and LP4, should focus on rezoning land to avoid inappropriate development to limit potential future liability for the Shire.

Proposed long term pathways for the individual Management Units within Ledge Point (LP1, LP2, LP3 and LP4) are provided in **Appendix I**. The key tools that will underpin the achievement of these long term pathways are planning controls, which were discussed in **Section 4**. Protection mechanisms using hard structures for the Township should be carefully assessed and guided by appropriate criteria to determine their suitability for implementation. Note the implementation of retreat through a managed retreat process or the do nothing and eventual abandonment needs to be carefully considered and implications for the Shire and private property owners addressed.

6.5.2 Short Term Implementation – Ledge Point Township South (LP2)

The following adaptation pathway is proposed:

Short to Medium term: Protect within budget constraints, but with erosion triggers for retreat in place

Recommendations arising from the above assessment are provided in **Table 6-2**.

Table 6-2 Recommendations and adaptation planning recommendations for LP2

ID	Recommendation
R_LP2.1	Planning for the proposed boat ramp/marina needs to consider the short term implementation plan and long term management pathways for Ledge Point articulated in this CHRMAP. Similarly, the Shire should carefully review any plans for such a development to ensure the proposal's long term impacts on adjacent coastline are adequately assessed and are consistent with the CHRMAP pathways.
R_LP2.2	Should the Shire wish to pursue the beach nourishment option, it is recommended that a suitable sediment source be identified and nourishment costs to extract, transport and place material from this source be refined. An affordable volume of nourishment can then be assessed and an appropriate beach profile designed to guide sand placement.
R_LP2.3	Investigate potential efficacy and cost of extending the existing southern groyne to increase salient stability and promote accretion to the south.
R_LP2.4	Commission a high level investigation of cost of an offshore breakwater based on existing natural reef offshore from southern groyne.



R_LP2.5	Evaluate aeolian transport rates and consider use of wind fences and limiting vehicle access at the base of the scarp to promote dune growth followed by dune stabilisation and planting.
R_LP2.6	Manage vehicle use to ensure that vehicles do not exacerbate erosion of existing beach and dune
R_LP2.7	Consider geotechnical investigations to identify if any subsurface rock exists within the 100-year hazard zone. This would increase the accuracy of the hazard assessment, and better inform the broader CHRMAP process.

6.6 Lancelin

6.6.1 Long Term Pathway

The long term pathway for the Lancelin Township should aim for the eventual managed retreat and accommodation of built infrastructure, as it becomes vulnerable to coastal hazards and/or interferes with the maintenance of an appropriate coastal foreshore reserve (as defined in Section 5.9 of SPP2.6). The development of emergency plans and controls should occur for the management of coastal hazards. For major infrastructure, such as commercial and residential property, managed retreat should occur when it is no longer viable to repair damaged property, such as Grace Darling Park, and risk to infrastructure becomes intolerable. For undeveloped areas, the long term pathway should focus on rezoning to avoid inappropriate development in future.

Proposed long term pathways for the individual Management Units within Lancelin (LA1, LA2, LA3 and LA4) are provided in **Appendix I**. The key tools underpinning the achievement of long term pathways are planning controls, which were discussed in **Section 4**. Prior to the adoption of any of the protection options it is recommended that these be investigated in detail and guided by appropriate trigger projections to determine their suitability for implementation.

6.6.2 Short Term Implementation – Lancelin South of Township (LA1)

Short to Medium term: Protect in a manner that maintains existing social values within budgetary constraints until such time as triggers for retreat are exceeded. Develop the planned retreat strategy to be implemented during the next stage of the CHRMAP (5 to 10 years).

Recommendations arising from the above assessment are provided in **Table 6-3**.

Table 6-3 Recommendations and adaptation planning recommendations for LA1

ID	Recommendation
R_LA1.1	Major investment decisions with regards to coastal infrastructure are reserved until after the coastal inundation impact assessment has been completed.
R_LA1.2	Sea rescue building be removed, however the ablation block and shade structures should remain until unserviceable.
R_LA1.3	Investigate renourishment using sand sourced from the salient.
R_LA1.4	Manage vehicle use in the area to ensure that vehicles do not exacerbate erosion.
R_LA1.5	Continue to involve Caravan Park lessors and local community in decisions regarding coastal management in this area to preserve coastal values and uses.

6.7 Shire of Gingin Monitoring Plan

Monitoring of the ongoing changes in actual shoreline movements and the response to storm erosion events is critical to assess compliance with trigger criteria for the management actions. Assessment and interpretation of monitoring observations will also inform future revisions of hazard lines and the CHRMAP reviews. The *Seabrid, Ledge Point, Lancelin – Coastal Monitoring Action Plan* (Seashore Engineering, 2017) provides a high level of detail on coastal monitoring for the townsites. Consistent with their recommendations the general monitoring, data collation and analysis is to include:



- > Annual Beach Profile Surveys;
- > Horizontal Shoreline Datum determination from aerial photos;
- > Post wave erosion event (>2 yr ARI wave) beach profile surveys;
- > Cyclone storm surge post-flood event inundation level surveys; and
- > Seawall, groyne and shoreline protection infrastructure condition monitoring after significant events.

The Shire will also require data from updates to the State and Federal programs providing offshore wave data, winds and rainfall, ecological community information, threatened species registers, aerial image updates general statistics on population census, social and financial conditions provided through Australian Bureau of statistics and local land price trends available from Real Estate websites. This information needs to be collated and assessed to inform updates to hazard line projections and revise CHRMAP adaptation strategies as required during the CHRMAP review each 5 to 10 years.

6.8 Shire of Gingin Implementation Plan (to 2030)

The implementation plan for the next decade up to 2030 is shown in the Gantt chart presented in **Figure 6-1** and Tasks listed below in **Table 6-4**. Implementation of the plan is obviously subject to budget considerations and available funding.

Table 6-4 Tasks for Implementation up to 2030, schedule start and end dates and approximate costs

Task Name	Start	Finish	Cost Estimate \$1,000s
Planning and Development Controls Review	1 Jan '18	28 Oct '20	\$155
Review Planning and Development Controls and Recommend Amendments as required	1 Mar '18	27 Sep '19	\$80
Amend current zone and SCA boundaries	1 May '18	31 Oct '18	\$15
Update SCA special provisions	29 Nov '18	30 Jan '19	\$20
Gingin LPS 9 Update and Endorsement by WAPC	17 Jan '20	30 Jun '20	\$40
Monitoring	1 May '18	14 May '29	\$410
Annual Beach Profile Surveys	4 May '18	14 May '29	\$300
Horizontal Shoreline Datum (Aerial Photo Analysis)	1 May '18	2 May '22	\$70
Post wave erosion Event (>2 yr ARI wave) Beach Profiles	11 Jan '19	17 Jan '19	\$30
Cyclone storm surge flooding Event	15 Mar '20	18 Mar '20	\$10
Specialist Investigations	26 Feb '18	28 Jul '25	\$415
Comprehensive investigation of each community and visitors be undertaken to identify beneficiaries of proposed protection areas	26 Feb '18	30 Nov '18	\$150
Investigate allowance for coastal foreshore reserve width to extend the 2110 Hazard line a sufficient distance to accommodate future relocation of foreshore assets	15 Mar '18	30 Jun '18	\$15
Assess Current and Future Sediment Budget in the Secondary Cell	1 Jul '18	30 Jun '21	\$80
Analysis of Flood, Storm Surge and Erosion event monitoring	14 May '20	5 Aug '20	\$40
Investigate Storm Surge and Coastal Processes Interactions to define triggers, set FFL, CHRMAP, Water Management Plans and Emergency Management Plan overlaps	25 Mar '25	28 Jul '25	\$50
Undertake economic analysis of options. Recommendations:	17 May '18	19 Sep '18	\$80
Operational	1 Feb '18	30 Nov '22	\$80
Establish Data Management and GIS system (time series, spot levels and remote sensing) relating to shoreline monitoring and general flooding in each Township to allow identification of trends over time, and Trigger assessment	1 Feb '18	26 Mar '19	\$50
Update Asset database to incorporate end of life date to facilitate future management of assets	1 Feb '18	26 Mar '19	\$20

Draft Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin

Notifications - Potentially affected land owners by direct contact and property titles	1 Feb '18	30 Nov '22	\$10
CHRMAP Review and Update (2022)	1 Jan '19	30 Nov '22	\$210
Review Hazard line estimates (S1, S2, S3 and S4)	18 Feb '21	21 Apr '21	\$25
Review Risk Assessment and Future Pathway Options	29 Apr '21	30 Jun '21	\$40
Community and Stakeholder Consultation	1 May '21	31 Jan '22	\$50
Update CHRMAP	24 Jun '21	2 Mar '22	\$80
CHRMAP 2022 Endorsement by WAPC	7 Jul '22	30 Nov '22	\$15
CHRMAP Review and Update (2027)	8 Oct '26	8 Nov '28	\$210
Review Hazard line estimates (S1, S2, S3 and S4)	8 Oct '26	6 Jan '27	\$25
Review Risk Assessment and Future Pathway Options	1 Jun '27	2 Aug '27	\$40
Community and Stakeholder Consultation	1 Nov '26	31 Aug '27	\$50
Update CHRMAP	24 Jun '27	1 Mar '28	\$80
CHRMAP 2027 Endorsement by WAPC	6 Jul '28	8 Nov '28	\$15

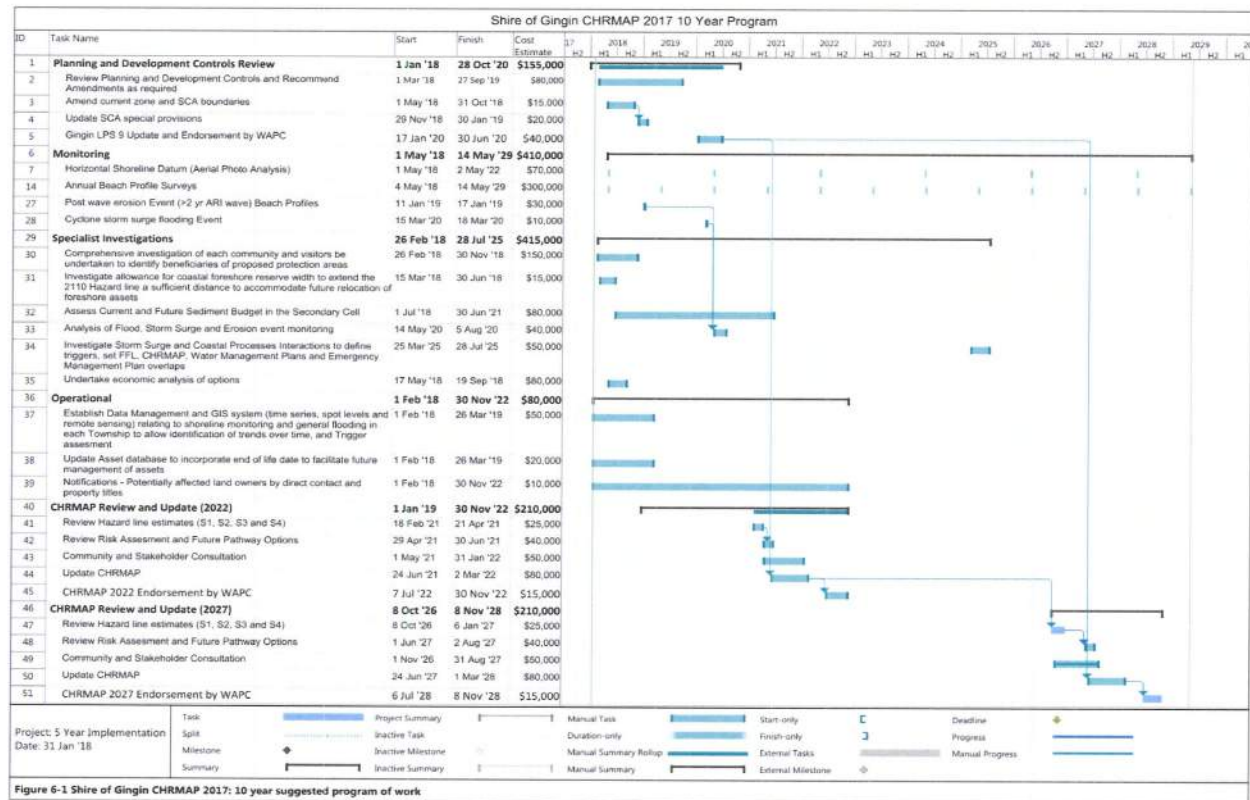


Figure 6-1 Shire of Gingin CHRMAP 2017: 10 year suggested program of work



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Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

A

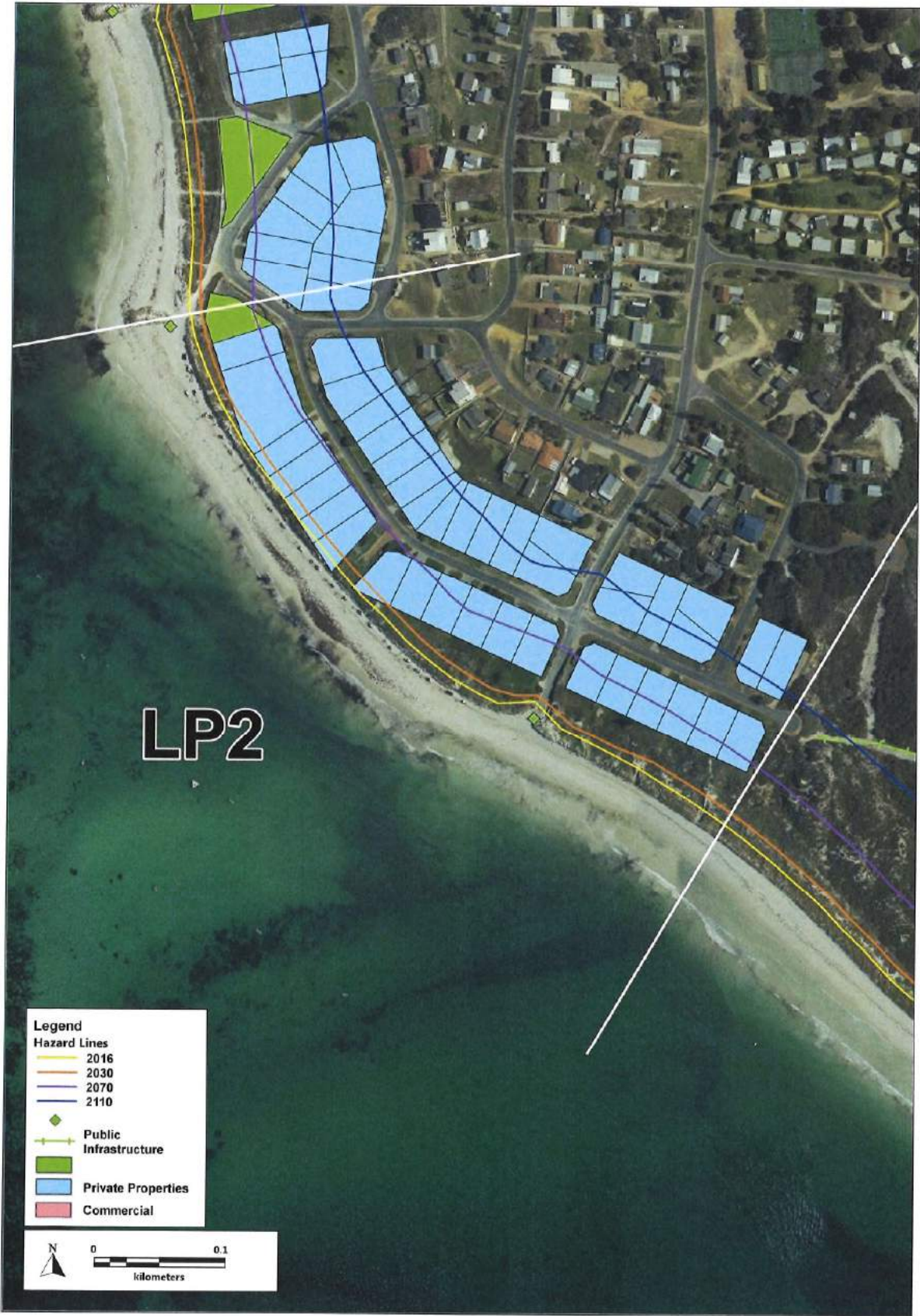
HAZARD MAPS BY
MANAGEMENT UNITS

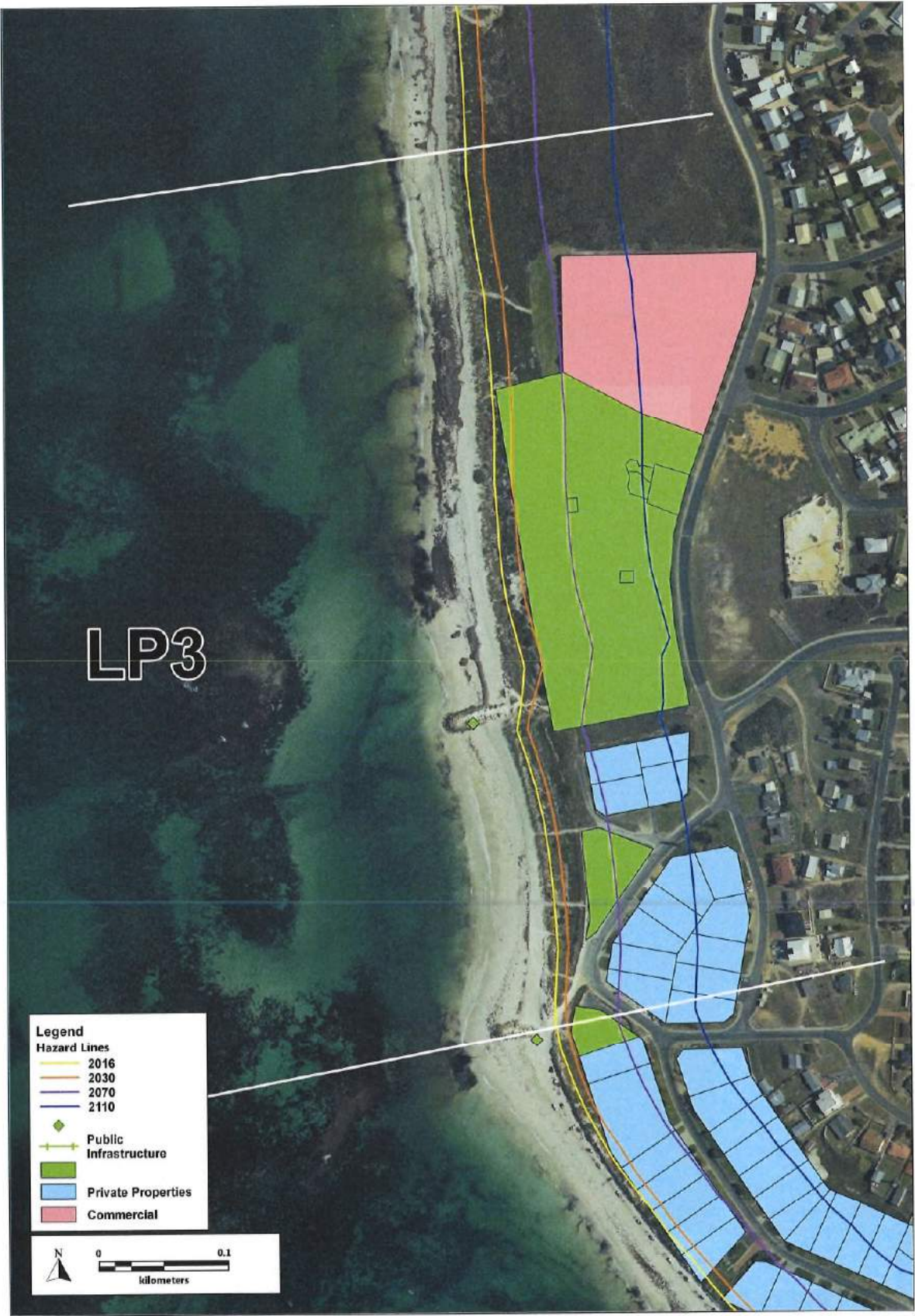




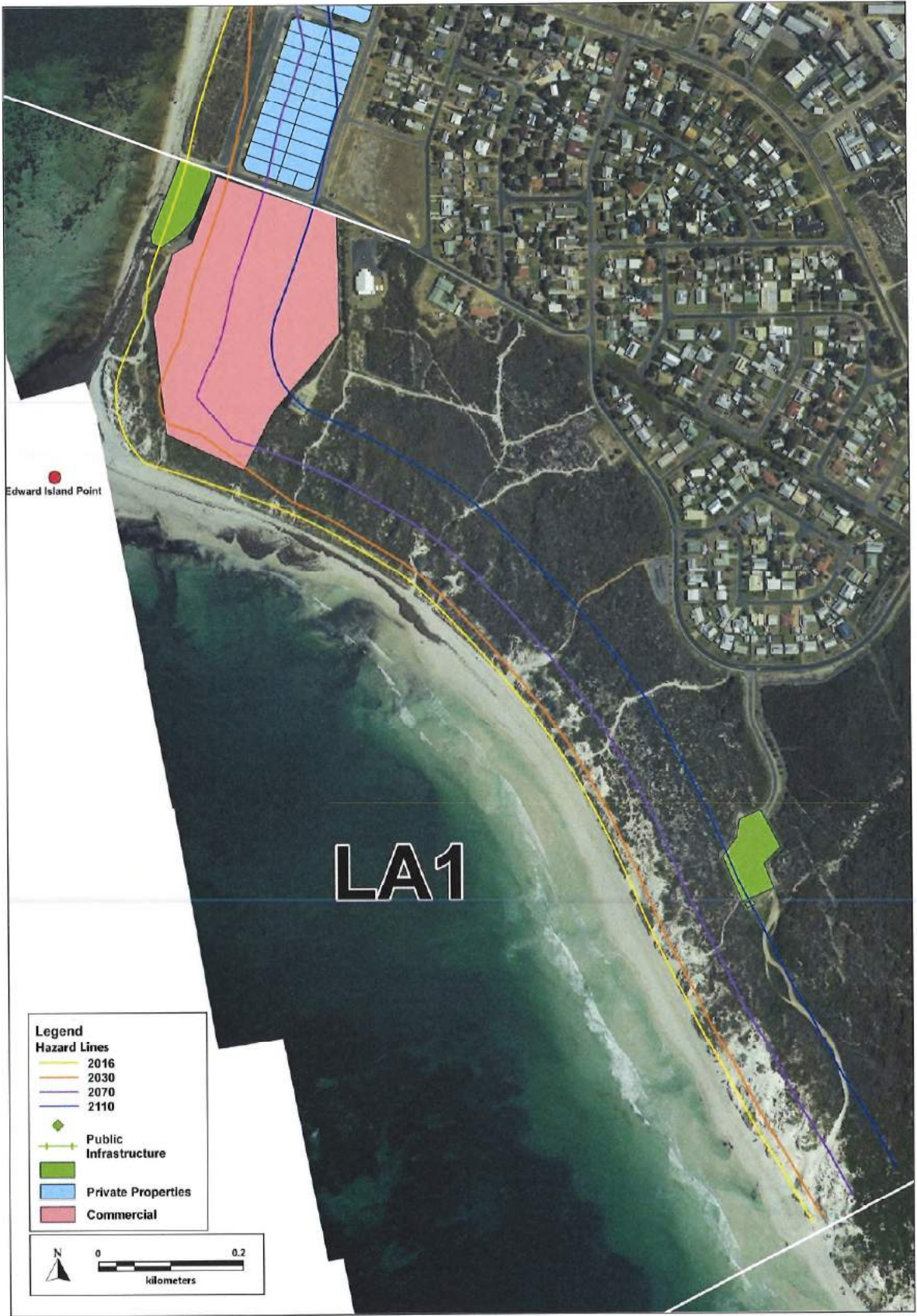


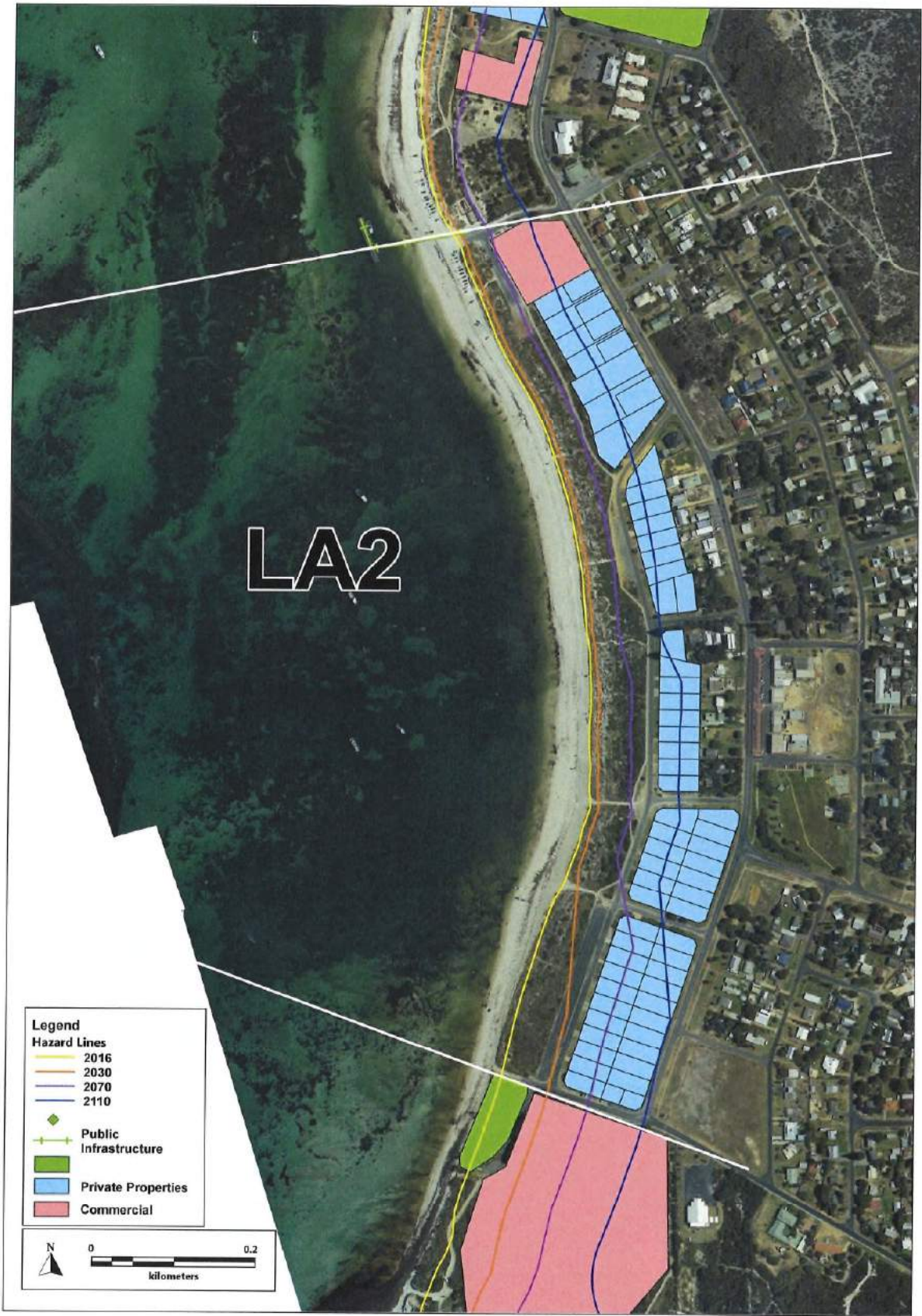
















Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

B

VALUE MAPS AND LIST OF
KEY STAKEHOLDERS





11 Harvest Terrace, West Perth,
WA, 6005, Australia
Phone: +61 8 9273 3888 Web: www.cardno.com

Please help us understand what you value about the
Lancelin coast, where do you like to work, rest and play?

Data Source: Department of Parks & Wildlife (2017) Threatened and Priority Flora/Fauna Databases.
Search for Cervantes accessed on 8 May 2017. Prepared by the Species and Communities Branch for Cardno for the
Shire of Dandaragan CHSMAPS.

Legend

- Recreational
- Environmental
- Commercial

- Infrastructure
- Civic
- Heritage

- Threatened Flora, Fauna:
Ecological Communities

Our Coastal Values

Cervantes

SHIRE OF DANDARAGAN

DATE
25/05/17

DRAWING NO
LA-001

ISSUE
DRAFT



Cardno
Shaping the Future

11 Harvest Terrace, West Perth,
WA, 6005, Australia
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Please help us understand what you value about the
Lancelin coast, where do you like to work, rest and play?

Legend

- Recreational
- Environmental
- Commercial

- Infrastructure
- Civic
- Heritage

- Threatened Flora, Fauna:
Ecological Communities

Our Coastal Values

Jurien Bay

SHIRE OF DANDARAGAN



DATE
25/05/17

DRAWING NO
LA-002

ISSUE
DRAFT



Please help us understand what you value about the Lancelin coast, where do you like to work, rest and play?

Legend

- Recreational
- Environmental
- Commercial
- Infrastructure
- Civic
- Heritage

- Threatened Flora, Fauna, Ecological Communities

Our Coastal Values

Lancelin



11 Harvest Terrace, West Perth,
WA, 6005, Australia
Phone: +61 8 9273 3888 Web: www.cardno.com

Data Source: Department of Parks & Wildlife (2017) Threatened and Priority Flora/Fauna Database.
Search for Lancelin accessed on 8 May 2017. Prepared by the Species and Communities Branch for Cardno for the Shire of Gingin CHRMAPS.



DATE:
25/05/17

DRAWING NO:
LA-003

ISSUE:
DRAFT



11 Harvest Terrace, West Perth,
WA, 6005, Australia
Phone: +61 8 9273 3898 Web: www.cardno.com

Please help us understand what you value about the
Lancelin coast, where do you like to work, rest and play?

Data Source: Department of Parks & Wildlife (2017) Threatened and Priority Flora/Fauna Database.
Search for Ledge Point accessed on 8 May 2017. Prepared by the Species and Communities Branch for Cardno for
the Shire of Gingin CHRMAPS.

Legend

- Recreational
- Environmental
- Commercial

- Infrastructure
- Civic
- Heritage

- Threatened Flora, Fauna,
Ecological Communities

Our Coastal Values

Ledge Point

SHIRE OF GINGIN



DATE
25/05/17

DRAWING NO
LA-004

STATUS
DRAFT



11 Harvest Terrace, West Perth,
WA, 6005, Australia
Phone: +61 8 9273 3888 Web: www.cardno.com

Please help us understand what you value about the
Lancelin coast, where do you like to work, rest and play?

Data Source: Department of Parks & Wildlife (2017) Threatened and Priority Flora/Fauna Databases.
Search for Seabird accessed on 8 May 2017. Prepared by the Species and Communities Branch for Cardno for the
Shire of Gingin CHIPMAPS.

Legend

- Recreational
- Environmental
- Commercial
- Infrastructure
- Civic
- Heritage

- Threatened Flora, Fauna,
Ecological Communities

Our Coastal Values

Seabird

SHIRE OF GINGIN



DATE
25/05/17

DRAWING NO
LA-005

ISSUE
DRAFT



Key stakeholders for engagement in the CHRMAP process

Internal Stakeholders	Community Groups	Impacted stakeholders	Interested External Stakeholder Groups
<ul style="list-style-type: none"> CHRMAP Steering Group Elected members and Executive Lead Team Shire planning and development departments Communications and marketing departments Emergency management departments Infrastructure / Asset Management Section Community Development 	<ul style="list-style-type: none"> Community and Ratepayers Associations: Seabird Progress Association Ledge Point Community Association Ledge Point Coastcare Group Friends of Lancelin Coast Lancelin Ratepayers Association Kwelena Mambakort Aboriginal Corporation (Yued) Local Chamber of Commerce 	<ul style="list-style-type: none"> Traditional Owners Residents, business owners and property owners located in areas vulnerable to coastal hazards. Residents, business owners and property owners who live in parts of the LGA that are not vulnerable to coastal hazards (e.g. ratepayers who may be subject to charges to fund adaptation works). Community members that are indirectly impacted by coastal hazards (e.g. users of coastal roads, parks, and other amenities). Agencies involved in the emergency response immediately prior to, during or after a storm/erosion event (incl. SES, WA Police, Fire Service and Ambulance Service). 	<ul style="list-style-type: none"> Department of Planning, Lands and Heritage (formerly the Departments of Planning, Lands, State Heritage Office and the Aboriginal heritage and land functions of the Department of Aboriginal Affairs) Department of Transport Northern Agricultural Catchments Council Department of Biodiversity, Conservation and Attractions (formerly Department of Parks and Wildlife) Western Australian Planning Commission Other WA State Government entities: (for example Main Roads, Department of Aboriginal Affairs, Department of Water, Department of Environmental Regulation, Department of State Development) Service providers: St Johns Ambulance, Local Police Stations, Bush Fire Brigade, Volunteer Marine Rescue, SES, SLSCs Utilities (e.g. Synergy, Water Corporation, Telstra) WA Local Government Association (WALGA) Local Government Insurers (LGIS) Developers Landcorp Wheatbelt Development Commission Moore Catchments Council City of Wanneroo Shire of Coorow Insurance Industry Representatives (TBA) WA Tourism WA Conservation Council

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Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX






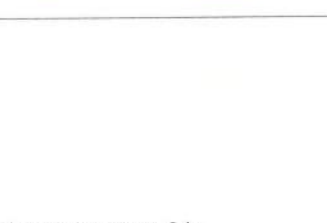
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ASSET INFORMATION FOR EACH OF
THE MANAGEMENT UNITS









SE1: Seabird Township South

		Values	Assets at Risk
 		Environmental	Beach Coastal/dune vegetation
		Social	Beach access Carpark Lookout, toilets and picnic area
		Economic - Private	Residential - 22 properties
		Economic - Public	Beach Carpark (Edward St) Stairs (decommissioned) Roads Services in road reserve
		Existing Coastal Controls	
		Small offshore reefs Seawall - sitting on rock platform, with matting placed over the top. Beach along seawall has eroded completely since Dec. 2016.	
		Existing Planning Controls	
		Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Some low-density residential Unallocated crown land Seabird Township Strategic Map	







SE2: Seabird Township North

		Values	Assets at Risk
   	Environmental	Beach Foreshore Reserve	
	Social	Beach Caravan Park (Seabird Private) Tavern	
	Economic - Private	Caravan Park - strata title lots Seabird Tavern	
	Economic - Public	Beach	
		Existing Coastal Controls	
		Small offshore reefs Seawall - sitting on rock platform, with matting placed over the top. Beach along seawall has eroded completely since Dec. 2016.	
		Existing Planning Controls	
		Local Planning Scheme No.9 (LP59) Reserves and Zoning Parks and Recreation Reserve Some low-density residential Tourism zone Seabird Township Strategic Map	








LP1: Ledge Point South of Township

		Values	Assets at Risk
 		Environmental	Beach Coastal/dune vegetation
		Social	Beach Beach carpark (unsealed) Road (Unsealed)
		Economic - Private	
		Economic - Public	Beach
		Existing Coastal Controls	
		Offshore reefs to north	
		Existing Planning Controls	
		Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Ledge Point Township Strategic Map Proposed future urban development	



LP2: Ledge Point Township South

		Values	Assets at Risk	
	   	Environmental	Beach	
		Social	Beach - popular boat launching and offshore mooring spot Beach access (Jones St)	
		Economic - Private	Residential - 39 properties	
		Economic - Public	Beach Roads (De Burgh St, Jones St, Ro St) Services in road reserve	
		Existing Coastal Controls		
		Offshore reefs to north		
		Existing Planning Controls		
		Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Ledge Point Township Strategic Map Proposed future urban development		





LP3: Ledge Point Township North

LP3: Ledge Point Township North

Values	Assets at Risk
Environmental	Beach Coastal/dune vegetation
Social	Beach - Lancelin Ocean Classic starting point Main swimming beach Beach access (Jones St) Coastal/dune vegetation Road (De Burgh St) Key Biscoyne Park
Economic - Private	Caravan Park (Holiday Village) - old caravan park, now town houses Residential -13 properties
Economic - Public	Beach Carparks (De Burgh St) BBQ and shelters Road (De Burgh St) Key Biscoyne Park Playground toilets and BBQs
Existing Coastal Controls	
Offshore reefs 2 Groynes	
Existing Planning Controls	
Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Low-density residential Road reserve Tourism zone Ledge Point Township Strategic Map	



LP4: Ledge Point North of Township

		Values	Assets at Risk
 		Environmental	Beach Coastal/dune vegetation
		Social	Beach Beach carpark (unsealed) Road (Unsealed)
		Economic - Private	
		Economic - Public	Beach
		Existing Coastal Controls	
		Offshore reefs	
		Existing Planning Controls	
		Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve General rural zone (?) Ledge Point Township Strategic Map Proposed future urban development	



Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix C: Asset Information

LA1: Lancelin South of Township






LA1: Lancelin South of Township

Values	Assets at Risk
Environmental	Beach Coastal/dune vegetation
Social	Beach Carpark (Back Beach) Grace Darling Park
Economic - Private	Sea Rescue Building
Economic - Public	Beach Carpark (Back Beach) Caravan Park (Lancelin South End) Grace Darling Park Cap park Toilet block
Existing Coastal Controls	
Edward Island and surrounding reefs Opportunistic beach renourishment during dredging	
Existing Planning Controls	
Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Low-density residential Tourism Lancelin Township Strategic Map Possible tourist zone expansion Linkage area to Lancelin South Development Identified as "sporting and recreation"	

November 2017
Job No.: 59917806
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LA2: Lancelin Township South of Jetty

		Values	Assets at Risk
 		Environmental	Beach
		Social	Beach Jetty Café (Kerfuffle By The Jetty)
		Economic - Private	Residential - 66 properties Light Industrial Area Café (Kerfuffle By The Jetty)
		Economic - Public	Beach Road (Cuncliffe St) Jetty
Existing Coastal Controls			
Edward Island and surrounding reefs to the south Lancelin Island to the north Offshore reef			
Existing Planning Controls			
Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Low-density residential Tourism zone Lancelin Township Strategic Map			




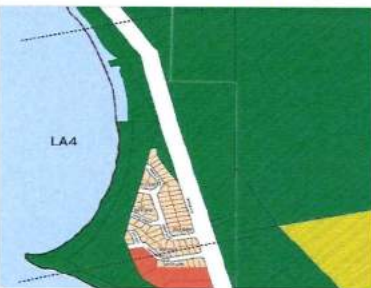



LA3: Lancelin Township Jetty to Lancelin Point

		Values	Assets at Risk
 		Environmental	Beach Coastal/dune vegetation Beach Lookout
		Social	Beach Park (Gingin Road) Primary School Tavern (Endeavour)
		Economic - Private	Beach Hotel & Dune Restaurant Tavern (Endeavour) Residential - 45 properties
		Economic - Public	Beach Fuel storage (DoT?) Road (Gingin Rd) Caravan Park (Lancelin North End) Park (Gingin Road) Primary School Beach Lookout
		Existing Coastal Controls	
		Lancelin Island and surrounding reefs	
		Existing Planning Controls	
		Local Planning Scheme No.9 (LP59) Reserves and Zoning Parks and Recreation Reserve Low-density residential Tourism zone Lancelin Township Strategic Map	



Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix C: Asset Information

LA4: Lancelin Township North of Lancelin Point

		Values	Assets at Risk
 		Environmental	Beach Coastal/dune vegetation
		Social	Beach Beach carpark Beach Access (Lancelin Island Point)
		Economic - Private	Residential - 41 properties
		Economic - Public	Beach
Existing Coastal Controls			
Lancelin Island and surrounding reefs			
Existing Planning Controls			
Local Planning Scheme No.9 (LPS9) Reserves and Zoning Parks and Recreation Reserve Road reserve Low density residential Tourism zone Lancelin Township Strategic Map Development to the north not possible due to sand blowout States: " Coastal setbacks required in accordance with State Planning Policy"			

November 2017
Job No.: 59917806
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Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

D

TECHNICAL NOTE ON RISK
ASSESSMENT METHODS



APPENDIX D RISK ASSESSMENT METHODOLOGY

1.1 Overview

The risk assessment process uses the outcomes of Part 1 of the CHRMAP to characterise the risk and vulnerability of assets over the planning time frame. An overview of the framework adopted in this assessment is presented in Figure 1-1.

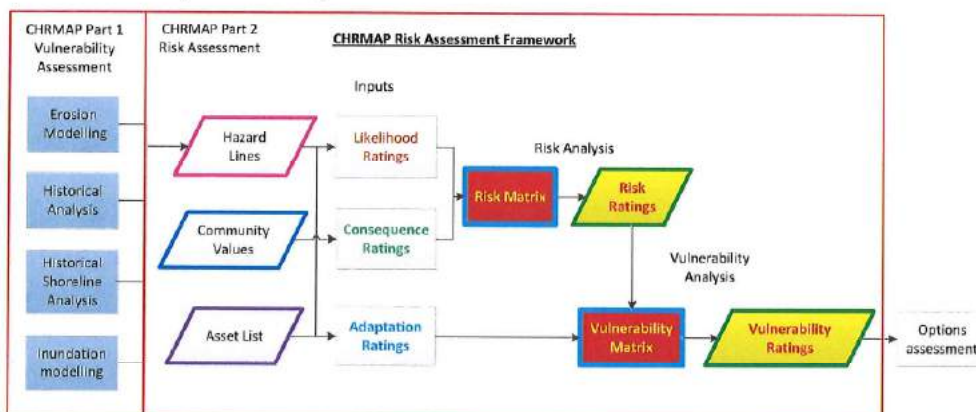


Figure 1-1 Schematic representation of the risk assessment process

There are a number of steps involved in the risk assessment process:

1. Define likelihood categories (ratings)
2. Allocate the likelihood of the risk occurring to specific assets for a particular planning timeframe based on the results of the hazard assessment;
3. Define consequence categories (ratings)
4. Allocate the consequence of the risk occurring to specific assets for a particular planning timeframe based on CHRMAP guidance, AS 5334-2013 and the project specific Success Criteria;
5. Define risk categories (ratings) based on the acceptability (or tolerability); and
6. Allocate the risk ratings for combinations of likelihood and consequence.

The process aims to be objective, logical and transparent. All steps call for interpretation, and allocation of consequence in particular may be based on subjective judgement. However, once the framework has been adopted, specific outcomes can be clearly traced to inputs. The inputs can be updated in response to new information or stakeholder input, and the risk assessment outcomes will be revised accordingly. Additional details on how the input parameters were derived, and the ratings were developed is provided below.



1.2 Risk Analysis

To assess the level of risk, or potential impact, posed to the assets by the identified coastal hazards, this CHRMAP has employed risk analysis techniques outlined in AS 5334-2013. The risk assessment entails the combination of likelihood and consequence of exposure to coastal hazard to produce the risk level, or potential impact, for each asset, as presented in Figure 1-2 below.

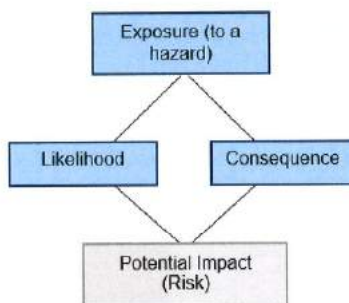


Figure 1-2 Risk analysis structure

The potential impact (risk) has been assessed for each asset at each of the planning timeframes:

- > Present Day (2016)
- > 2030
- > 2070
- > 2110

This allows risk prioritisation and assessment of each asset's risk level over the 100 year planning horizon as required by SPP2.6.

For the purposes of this report 'short-term' refers to the period between 2015 and 2030, 'medium-term' refers to the period between 2030 and 2050, and long-term refers to the period beyond 2050. The 'immediate-term' or 'immediately' may also be used, generally referring to within the next 5 years.

1.2.2 Likelihood

According to WAPC (2014) and for the purposes of this study, likelihood is defined as the chance of erosion and storm surge inundation impacting on existing and future assets and their values. The likelihood scale that has been applied at each timeframe is presented in Error! Reference source not found.

Table 1-1 CHRMAP likelihood ratings

Rating	Description
Almost Certain	High possibility of impact to asset shoreline for a given planning timeframe
Likely	Impact to asset shoreline for a given planning timeframe is likely
Possible	Impact to asset shoreline for a given planning timeframe is possible
Unlikely	Impact to asset shoreline for a given planning timeframe is unlikely
Rare	May occur in exceptional circumstances



As outlined in Section 3, the erosion risk is made up of a number of components. Each of these is based on a suite of assumptions and each has a degree of uncertainty which may influence the likelihood of the predicted level of erosion occurring at each planning horizon. For instance, S1 assumes that the probability of a coastal hazard event occurring is the same each year, which is not necessarily the case when considering the effects of climate change and the rise in sea level over time, which underpins the future planning scenarios assessed in this study.

There is considerable scope for confusion in defining and allocating likelihood in terms of recurrence frequency / probability (as per AS 5334) for the purposes of risk assessment, since this terminology has specific meaning in the coastal context. Cardno has therefore adopted the approach presented in Figure 1-3, which is generally consistent with guidance in WAPC (2014). An example of the likelihood rating input format for assets in a particular study site is provided in Table 1-2.

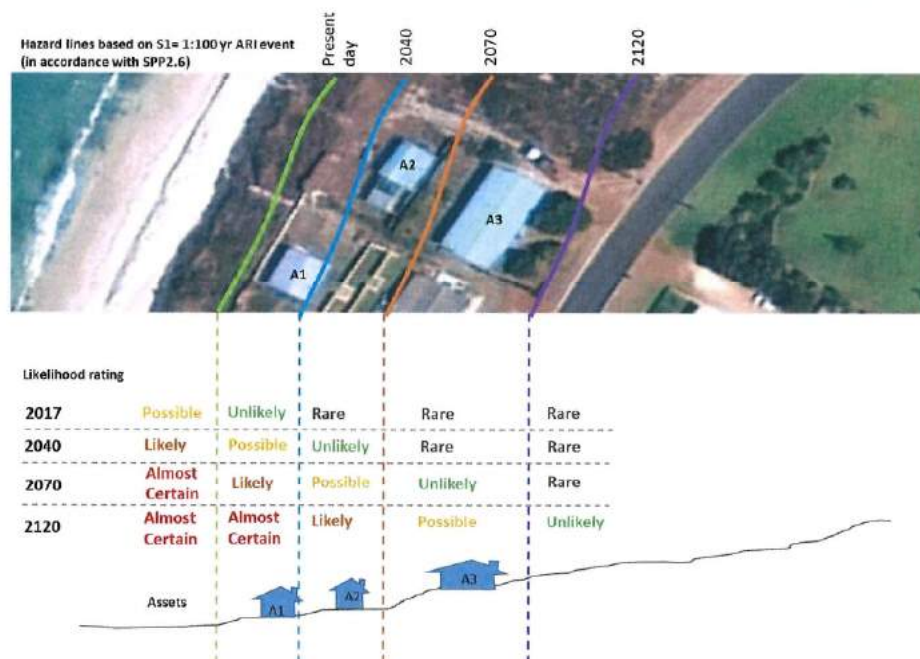


Figure 1-3 Representation of method used to assign likelihood ratings to individual assets for each planning timeframe

Table 1-2 Example likelihood rating inputs table

Asset	Planning timeframe			
	Present Day	2030	2070	2110
Beach	Unlikely	Possible	Almost Certain	Almost Certain
Car Park	Rare	Rare	Possible	Almost Certain
Road	Rare	Rare	Possible	Almost Certain
Residential Lots	Rare	Rare	Unlikely	Likely



1.2.3 Consequence

Consequence is the result of a hazard impacting an area or asset. For this analysis, consequence has been divided into five ratings ranging from catastrophic to insignificant (Table 1-3). The consequence ratings for this risk assessment have been adapted from those presented in AS 5334-2013, and WAPC (2014), which focus on the social, economic and environmental consequences.

A heritage component has been incorporated alongside environmental impacts to ensure impacts to heritage sites are accounted for in the risk assessment process. The consequence descriptions have also been scaled to be applicable to the local context in which this study is being undertaken, where as previously their higher ratings were associated with consequences on a global scale. Generally, the consequence categories incorporate all of the values outlined by the success criteria and align comparatively between categories with the level of response to these success criteria.

Unless otherwise stated, the consequence ratings are generally associated with the impact of coastal erosion. Generally coastal inundation and coastal erosion will occur at the same time during a storm event. In the majority of circumstances and locations for the City's coastline, the impacts of coastal erosion on infrastructure will be more severe and long-lasting than the impacts of coastal inundation. There are circumstances where coastal erosion will not occur (e.g. where the shoreline is rock) and in these instances only the consequences of coastal inundation are considered

Table 1-3 Consequence ratings (adapted from AS 5334-2013)

Rating	Safety and Social	Economic	Environment and Heritage
Catastrophic	Loss of life and serious injury. Large long-term or permanent loss of services, public access/amenity, employment, wellbeing or culture. No suitable alternative sites exist within the LGA.	Permanent and/or entire loss or damage to property, plant and equipment, finances >\$10 million	Permanent and entire loss of flora, fauna conservation or heritage area (no chance of recovery)
Major	Serious injury. Medium term disruption to services, public access/amenity, employment, wellbeing or culture. Very limited suitable alternative sites exist within the LGA.	Permanent and/or large scale loss or damage to property, plant and equipment, finances > \$2 - \$10 million	Long-term and/or large scale loss of flora, fauna or heritage area (limited chance of recovery) with local impact.
Moderate	Minor injury. Major short term or minor long-term disruption to services, public access/amenity, employment, wellbeing, or culture. Limited suitable alternative sites exist within the LGA.	Permanent and/or medium scale loss or damage to property, plant and equipment, finances > \$100,000 - \$2 million	Medium-term and/or medium scale loss of flora, fauna or heritage area (recovery likely) with local impact.
Minor	Small to medium disruption to services, public access/amenity, employment, wellbeing, or culture. Many suitable alternative sites exist within the LGA.	Permanent and/or small scale loss or damage to property, plant and equipment, finances > \$10,000 - \$100,000	Short-term and/or small scale loss of flora, fauna or heritage area (strong recovery) with local impact.
Insignificant	Minimal short-term inconveniences to services, public access/amenity, employment, wellbeing, or culture. Many suitable alternative sites exist within the LGA.	Permanent loss or damage to property, plant and equipment, finances < \$10,000	Negligible to no loss of flora, fauna or heritage area (strong recovery) with local impact.



Consequence was allocated for each asset within a vulnerable area, and for each of the planning timeframes. It was possible for the severity of consequence to increase over time, assuming that impacts could be greater as well as more likely to occur. An example of the format of consequence rating inputs is provided in Table 1-4.

Table 1-4 Example consequence ratings applied to a vulnerable area

Asset	Planning timeframe			
	Present day	2030	2070	2110
Impact on Beach	Major	Major	Catastrophic	Catastrophic
Impact on Car Park	Moderate	Moderate	Moderate	Moderate
Impact on Road	Moderate	Moderate	Major	Major
Impact on Residential Lots	Minor	Minor	Minor	Major

1.3 Risk Evaluation

1.3.1 Potential Impact (Risk Rating)

The CHRMAP uses a risk assessment matrix which is based on that provided in AS5334-2013 (Table 1-5). Risk ratings are defined by risk acceptability / tolerance and the urgency of required action (Table 1-6). This will help to prioritise multiple identified risks within the study area. It also provides a mechanism to compare the level of risk after a preferred adaptation option is determined, for example, at present a risk may be "extreme" in the short term, after the implementation of adaption option 'X' the risk level is re-evaluated and reduces to "medium".

Table 1-5 Risk matrix (Based on AS5334-2013)

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	L	M	H	E	E
Likely	L	M	M	H	E
Possible	L	L	M	H	E
Unlikely	L	L	M	M	H
Rare	L	L	L	M	M

Table 1-6 Risk levels and tolerances

Risk Level	Action Required	Acceptance / Tolerance
Extreme (E)	Immediate action required to eliminate or reduce risk to acceptable levels.	Unacceptable
High (H)	Immediate to short-term action required to eliminate or reduce risk to acceptable levels.	Tolerable / Unacceptable
Medium (M)	Short to medium term action to reduce risk to acceptable levels, or accept risk.	Tolerable
Low (L)	Accept risk.	Acceptable



The risk evaluation process utilises the outcomes of the risk analysis as inputs. Likelihood and consequence allocated for assets, under each scenario, are combined to derive a risk rating for each asset within each of vulnerable areas. Examples of the derived risk ratings for a particular study site are provided in Table 1-7.

Table 1-7 Example of risk rating results by asset and planning timeframe

Asset	Planning Timeframe			
	Present Day	2030	2070	2110
Beach	Medium	Medium	Extreme	Extreme
Car Park	Low	Low	Medium	High
Road	Low	Low	High	Extreme
Residential Lots	Low	Low	Medium	High

1.4 Vulnerability Analysis

As per AS 5334-2013, detailed risk analysis should include a vulnerability analysis to thoroughly examine how coastal hazards and climate change may affect the asset.

Vulnerability analysis involves assessing the asset's existing capacity to adapt to a potential impact; a flow chart for the process of establishing the vulnerability is presented in Figure 1-4. Adaptive capacity and vulnerability are detailed in the following sections

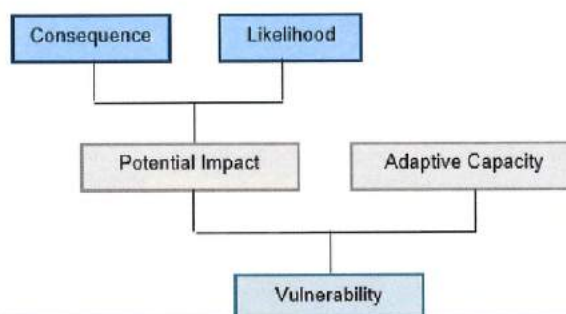


Figure 1-4 Vulnerability assessment structure

1.4.2 Adaptive Capacity

The adaptive capacity (Table 1-8) is based upon the potential for the system to be modified or acclimatise to cope with the impacts of identified hazards. The system of existing controls, such as the dune system and reef, all have an influence on the ability of hazards to affect a study site. The aim of the CHRMAP is to develop options that realise the potential adaptive capacity through techniques such as managed retreat, accommodation, and protection. An asset or group of assets with a high adaptive capacity is one that can easily (i.e. at low cost) be adapted or one that has some capacity to self-adapt with changing conditions (e.g. beaches and dune systems can migrate across shore as the mean sea level (MSL) changes). Assets with a high risk level and low adaptive capacity are deemed vulnerable and management options should be investigated. Examples of the adaptive capacity ratings allocated for a particular study site are provided in Table 1-9.



Table 1-8 CHRMAP adaptive capacity ratings

Rating	Adaptive Capacity
Low	Little or no adaptive capacity. Potential impact would destroy all functionality.
Moderate	Small amount of adaptive capacity. Difficult but possible to restore functionality through repair and redesign.
High	Decent adaptive capacity. Functionality can be restored, although additional adaptive measures should still be considered. Natural adaptive capacity restored slowly over time under average conditions.
Very High	Good adaptive capacity. Functionality restored easily. Adaptive systems restored at a relatively low cost or naturally over time.

Table 1-9 Example of adaptive capacity ratings applied to assets and timeframes

	Planning Timeframe			
	Present Day	2030	2070	2110
Asset	Adaptive Capacity			
Beach	High	High	Moderate	Low
Car Park	Moderate	Moderate	Moderate	Moderate
Road	Moderate	Low	Low	Low
Residential Lots	Low	Low	Low	Low



1.4.3 Vulnerability

Vulnerability is the potential for a system to suffer damage or ill effects as a result of coastal hazards or climate change. Vulnerability is a function of the likelihood of an event occurring, the consequences of the event and the capacity to adapt and change. In a similar fashion to the risk methodology, potential impact and adaptive capacity can be combined using a customised matrix (Table 1-10) with the significance of the vulnerability rating listed in relation to acceptability and tolerances provided in Table 1-11. An example outcome from the analysis is provided in Table 1-12.

Table 1-10 Vulnerability Analysis Matrix

Risk Level (Potential Impact)	Adaptive Capacity			
	Very High	High	Moderate	Low
Extreme	H	H	VH	VH
High	M	H	H	VH
Medium	M	M	M	H
Low	L	L	L	L

Table 1-11 Vulnerability levels and tolerances

Vulnerability Level	Action Required	Acceptance / Tolerance
Very High (VH)	Significant further adaption required to ensure asset is not lost. Reconsideration of design if vulnerability cannot be reduced.	Unacceptable
High (H)	Further adaption required. All stakeholders should be fully aware of risks if vulnerability cannot be reduced.	Tolerable / Unacceptable
Medium (M)	Further adaption should be investigated, acceptable in certain circumstances. Monitoring programs recommended.	Tolerable
Low (L)	Acceptable; adaption and monitoring may be required over the asset's lifetime.	Tolerable / Acceptable



Table 1-12 Example of outcome from vulnerability analysis

	Planning Timeframe			
	Present Day	2030	2070	2110
Asset	Vulnerability			
Beach	Low	Low	Medium	High
Car Park	Low	Low	Medium	High
Road	Low	Low	Low	Medium
Residential Lots	Low	Low	Low	High

Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

E

RISK ASSESSMENT RATINGS
AND RESULTS





Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

SE1: Seabird Township South

Assessment Inputs						
	2016	2020	2030	2050	2070	2110
Asset	Likelihood					
Beach	Possible	Likely	Almost Certain	Almost Certain	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain	Almost Certain	Almost Certain
Residential (houses and land)	Possible	Likely	Almost Certain	Almost Certain	Almost Certain	Almost Certain
Carparks and roads	Possible	Likely	Almost Certain	Almost Certain	Almost Certain	Almost Certain

Asset	Consequence of Erosion					
Impact on beach amenity	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Impact on ecological buffer	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Impact on residential lots	Major	Major	Major	Major	Catastrophic	Catastrophic
Impact on beach carpark and roads	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Asset	Adaptive capacity					
Beach	High	Moderate	Moderate	Low	Low	Low
Coastal/dune vegetation	Moderate	Moderate	Moderate	Low	Low	Low
Residential (houses and land)	Low	Low	Low	Low	Low	Low
Carparks and roads	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Risk Assessment						
	2016	2020	2030	2050	2070	2110
	Risk					
Beach	Medium	Medium	High	High	High	High
Coastal/dune vegetation	Medium	Medium	High	High	High	High
Residential (houses and land)	High	High	Extreme	Extreme	Extreme	Extreme
Carparks and roads	Medium	Medium	High	High	High	High

	Vulnerability					
Beach	Medium	Medium	High	Very High	Very High	Very High
Coastal/dune vegetation	Medium	Medium	High	Very High	Very High	Very High
Residential (houses and land)	Very High	Very High	Very High	Very High	Very High	Very High
Carparks and roads	Medium	Medium	High	High	High	High



Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

SE2: Seabird Township North

Assessment Inputs						
	2016	2020	2030	2050	2070	2110
Asset	Likelihood					
Beach	Possible	Likely	Almost Certain	Almost Certain	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain	Almost Certain	Almost Certain
Caravan Park (Seabird Private)	Rare	Unlikely	Possible	Likely	Almost Certain	Almost Certain
Tavern	Rare	Rare	Unlikely	Possible	Likely	Almost Certain

Asset	Consequence of Erosion					
Impact on beach amenity	Minor	Minor	Moderate	Moderate	Moderate	Moderate
Impact on ecological buffer	Minor	Minor	Minor	Moderate	Moderate	Moderate
Impact on Caravan Park (Seabird Private)	Minor	Minor	Moderate	Major	Major	Major
Impact on Tavern	Minor	Minor	Moderate	Moderate	Moderate	Moderate

Asset	Adaptive capacity					
Beach	Very High	Very High	High	Moderate	Moderate	Moderate
Coastal/dune vegetation	High	High	Moderate	Moderate	Moderate	Low
Caravan Park (Seabird Private)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Tavern	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Risk Assessment						
	2016	2020	2030	2050	2070	2110
	Risk					
Beach	Low	Medium	High	High	High	High
Coastal/dune vegetation	Low	Medium	Medium	High	High	High
Caravan Park (Seabird Private)	Low	Low	Medium	High	Extreme	Extreme
Tavern	Low	Low	Medium	Medium	Medium	High

	Vulnerability					
Beach	Low	Medium	High	High	High	High
Coastal/dune vegetation	Low	Medium	Medium	High	High	Very High
Caravan Park (Seabird Private)	Low	Low	Medium	High	Very High	Very High
Tavern	Low	Low	Medium	Medium	Medium	High



Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LP1: Ledge Point South of Township

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain
Beach Carpark (unsealed)	rare	Unlikely	Possible	Likely
Road (unsealed)	Rare	Rare	Unlikely	Possible

Asset	Consequence of Erosion			
Impact on beach amenity	Insignificant	Insignificant	Insignificant	Insignificant
Impact on ecological buffer	Minor	Minor	Minor	Moderate
Impact on carpark	Minor	Minor	Minor	Minor
Impact on 4WD track	Insignificant	Insignificant	Insignificant	Insignificant

Asset	Adaptive capacity			
Beach	Very High	Very High	Very High	Very High
Coastal/dune vegetation	High	High	Moderate	Moderate
Beach Carpark (unsealed)	High	High	High	High
Road (unsealed)	High	High	High	High

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Medium	Medium	High
Beach Carpark (unsealed)	Low	Low	Low	Medium
Road (unsealed)	Low	Low	Low	Low

	Vulnerability			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Medium	Medium	High
Beach Carpark (unsealed)	Low	Low	Low	Medium
Road (unsealed)	Low	Low	Low	Low



Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LP2: Ledge Point Township South

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Almost Certain	Almost Certain
Foreshore recreation area	rare	unlikely	Possible	likely
Residential	Possible	Likely	Almost Certain	Almost Certain
Roads	Unlikely	Possible	Almost Certain	Almost Certain

Asset	Consequence of Erosion			
Impact on beach amenity	Moderate	Moderate	Moderate	Moderate
Impact on recreation area	Minor	Minor	Moderate	Major
Impact on residential lots	Moderate	Major	Major	Catastrophic
Impact on roads	Minor	Minor	Moderate	Major

Asset	Adaptive capacity			
Beach	Very High	Very High	High	Moderate
Foreshore recreation area	High	High	Moderate	Moderate
Residential	Low	Low	Low	Low
Roads	Moderate	Moderate	Moderate	Moderate

Risk Assessment				
	2015	2030	2070	2110
	Risk			
Beach	Medium	Medium	High	High
Foreshore recreation area	Low	Low	Medium	High
Residential	Medium	High	Extreme	Extreme
Roads	Low	Low	High	Extreme

	Vulnerability			
Beach	Medium	Medium	High	High
Foreshore recreation area	Low	Low	Medium	High
Residential	High	Very High	Very High	Very High
Roads	Low	Low	High	Very High



Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LP3: Ledge Point Township North

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain
Carpark (De Burgh St)	Unlikely	Unlikely	Possible	Almost Certain
Road (De Burgh St)	Unlikely	Unlikely	Possible	Almost Certain
Holiday Village	Rare	Rare	Unlikely	Possible
Residential	Possible	Likely	Almost Certain	Almost Certain
Key Biscoyne Park	Unlikely	Possible	Likely	Almost Certain

Asset	Consequence of Erosion			
Impact on beach amenity	Insignificant	Insignificant	Minor	Moderate
Impact on ecological buffer	Minor	Minor	Minor	Major
Impact on carpark a	Insignificant	Minor	Moderate	Moderate
Impact on De Burgh St	Insignificant	Minor	Moderate	Moderate
Impact on Holiday Village	Insignificant	Insignificant	Moderate	Catastrophic
Impact on residential lots	Insignificant	Insignificant	Moderate	Major
Impact on Key Biscoyne Park	Minor	Minor	Moderate	Major

Asset	Adaptive capacity			
Beach	Very High	High	High	Moderate
Coastal/dune vegetation	High	High	Moderate	Low
Carpark (De Burgh St)	Moderate	Moderate	Moderate	Moderate
Road (De Burgh St)	Moderate	Moderate	Moderate	Moderate
Holiday Village	Low	Low	Low	Low
Residential	Low	Low	Low	Low
Key Biscoyne Park	High	High	Moderate	Moderate

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Low	Medium	High
Coastal/dune vegetation	Low	Medium	Medium	Extreme
Carpark (De Burgh St)	Low	Low	Medium	High
Road (De Burgh St)	Low	Low	Medium	High
Holiday Village	Low	Low	Medium	Extreme
Residential	Low	Low	High	Extreme
Key Biscoyne Park	Low	Low	Medium	Extreme

	Vulnerability			
Beach	Low	Low	Medium	High
Coastal/dune vegetation	Low	Medium	Medium	Very High
Carpark (De Burgh St)	Low	Low	Medium	High
Road (De Burgh St)	Low	Low	Medium	High
Holiday Village	Low	Low	High	Very High
Residential	Low	Low	Very High	Very High
Key Biscoyne Park	Low	Low	Medium	Very High

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Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LP4: Ledge Point North of Township

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	likely	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	likely	Almost Certain	Almost Certain
Carpark (unsealed)	Rare	Rare	Possible	Almost Certain
Road (unsealed)	Rare	Rare	Unlikely	Possible

Asset	Consequence of Erosion			
Impact on beach amenity	Insignificant	Insignificant	Insignificant	Insignificant
Impact on ecological buffer	Insignificant	minor	minor	minor
Impact on carpark	Insignificant	Insignificant	Insignificant	Insignificant
Impact on 4WD track	Insignificant	Insignificant	Insignificant	Insignificant

Asset	Adaptive capacity			
Beach	Very High	Very High	Very High	Very High
Coastal/dune vegetation	High	High	High	High
Carpark (unsealed)	Very High	Very High	Very High	Very High
Road (unsealed)	Very High	Very High	Very High	Very High

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Medium	Medium	Medium
Carpark (unsealed)	Low	Low	Low	Low
Road (unsealed)	Low	Low	Low	Low

	Vulnerability			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Medium	Medium	Medium
Carpark (unsealed)	Low	Low	Low	Low
Road (unsealed)	Low	Low	Low	Low



Coastal Hazard Risk Management and Adaption Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LA1: Lancelin South of Township

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain
Carpark (Back Beach)	Rare	Rare	Unlikely	Possible
Caravan Park (Lancelin South End)	Unlikely	Possible	Likely	Almost Certain
Sea Rescue	Possible	Likely	Almost Certain	Almost Certain
Grace Darling Park	Possible	Likely	Almost Certain	Almost Certain

Asset	Consequence of Erosion			
Impact on beach amenity	Insignificant	Insignificant	Insignificant	Insignificant
Impact on ecological buffer	Insignificant	Insignificant	Minor	Minor
Impact on Back Beach carpark	Minor	Minor	Minor	Minor
Impact on Caravan park	Moderate	Moderate	Major	Major
Impact on Sea Rescue offices	Moderate	Moderate	Moderate	Moderate
Impact on Grace Darling Park	Major	Major	Major	Major

Asset	Adaptive capacity			
Beach	Very High	Very High	Very High	Very High
Coastal/dune vegetation	High	High	High	High
Carpark (Back Beach)	High	High	High	High
Caravan Park (Lancelin South End)	Moderate	Moderate	Moderate	Moderate
Sea Rescue	Low	Low	Low	Low
Grace Darling Park	Moderate	Moderate	Moderate	Moderate

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Low	Medium	Medium
Carpark (Back Beach)	Low	Low	Low	Low
Caravan Park (Lancelin South End)	Medium	Medium	High	Extreme
Sea Rescue	Medium	Medium	High	High
Grace Darling Park	High	High	Extreme	Extreme

	Vulnerability			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Low	Medium	Medium
Carpark (Back Beach)	Low	Low	Low	Low
Caravan Park (Lancelin South End)	Medium	Medium	High	Very High
Sea Rescue	High	High	Very High	Very High
Grace Darling Park	High	High	Very High	Very High



Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LA2: Lancelin Township South of Jetty

Asset	Assessment Inputs			
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Likely	Almost Certain
Coastal/dune vegetation	Possible	Likely	Likely	Almost Certain
Residential	Rare	Unlikely	Possible	Likely
Road (Cunliffe St)	Unlikely	Possible	Likely	Almost Certain
Jetty	Possible	Likely	Almost Certain	Almost Certain
Light Industrial	Rare	Rare	Unlikely	possible
Café	Rare	Rare	Unlikely	possible

Asset	Consequence of Erosion			
Impact on beach amenity	Insignificant	Minor	Moderate	Major
Impact on ecological buffer	Insignificant	Minor	Moderate	Major
Impact on residential lots	Insignificant	Minor	Moderate	Major
Impact on Cunliffe St	Insignificant	Minor	Moderate	Moderate
Impact on Jetty	Minor	Minor	Moderate	Moderate
Impact on light industrial area	Moderate	Moderate	Major	Major
Impact on café	Moderate	Moderate	Major	Major

Asset	Adaptive capacity			
Beach	High	Moderate	Low	Low
Coastal/dune vegetation	High	Moderate	Low	Low
Residential	Low	Low	Low	Low
Road (Cunliffe St)	Moderate	Moderate	Moderate	Moderate
Jetty	Moderate	Moderate	Moderate	Moderate
Light Industrial	Moderate	Moderate	Moderate	Moderate
Café	Moderate	Moderate	Moderate	Moderate

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Medium	Medium	Extreme
Coastal/dune vegetation	Low	Medium	Medium	Extreme
Residential	Low	Low	Medium	High
Road (Cunliffe St)	Low	Low	Medium	High
Jetty	Low	Medium	High	High
Light Industrial	Low	Low	Medium	High
Café	Low	Low	Medium	High

	Vulnerability			
Beach	Low	Medium	High	Very High
Coastal/dune vegetation	Low	Medium	High	Very High
Residential	Low	Low	High	Very High
Road (Cunliffe St)	Low	Low	Medium	High
Jetty	Low	Medium	High	High
Light Industrial	Low	Low	Medium	High
Café	Low	Low	Medium	High

November 2017
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Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LA3: Lancelin Township Jetty to Lancelin Point

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain
Road (Gingin Rd)	Rare	Unlikely	Possible	Likely
Caravan Park (Lancelin North End)	Rare	Unlikely	Possible	Likely
Hotel & Restaurant	Rare	Unlikely	Possible	Likely
Park (Gingin Rd)	Rare	Unlikely	Possible	Likely
Primary School	Rare	Rare	Unlikely	Possible
Tavern (Endeavour)	Rare	Unlikely	Possible	Likely
Residential	Rare	Unlikely	Possible	Likely

Asset	Consequence of Erosion			
Impact on beach amenity	Minor	Moderate	Moderate	Major
Impact on ecological buffer	Minor	Moderate	Moderate	Major
Impact on Gingin Rd	Minor	Moderate	Moderate	Moderate
Impact on caravan park	Moderate	Moderate	Major	Major
Impact on Beach Hotel & Dunes Restaurant	Minor	Moderate	Major	Major
Impact on park on Gingin Rd	Minor	Moderate	Major	Major
Primary School becomes impacted	Moderate	Moderate	Moderate	Moderate
Impact on tavern	Moderate	Moderate	Major	Major
Impact on residential lots	Minor	Major	Major	Catastrophic

Asset	Adaptive capacity			
Beach	High	Moderate	Moderate	Low
Coastal/dune vegetation	High	Moderate	Moderate	Low
Road (Gingin Rd)	Moderate	Moderate	Moderate	Moderate
Caravan Park (Lancelin North End)	Moderate	Moderate	Moderate	Moderate
Hotel & Restaurant	Moderate	Moderate	Moderate	Moderate
Park (Gingin Rd)	High	High	High	High
Primary School	Moderate	Moderate	Moderate	Moderate
Tavern (Endeavour)	Moderate	Moderate	Moderate	Moderate
Residential	Low	Low	Low	Low

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Medium	High	Extreme
Coastal/dune vegetation	Low	Medium	High	Extreme
Road (Gingin Rd)	Low	Medium	Medium	Medium
Caravan Park (Lancelin North End)	Low	Medium	High	High
Hotel & Restaurant	Low	Medium	High	High
Park (Gingin Rd)	Low	Medium	High	High
Primary School	Low	Low	Medium	Medium
Tavern (Endeavour)	Low	Medium	High	High
Residential	Low	Medium	High	Extreme

	Vulnerability			
Beach	Low	Medium	High	Very High
Coastal/dune vegetation	Low	Medium	High	Very High
Road (Gingin Rd)	Low	Medium	Medium	Medium
Caravan Park (Lancelin North End)	Low	Medium	High	High
Hotel & Restaurant	Low	Medium	High	High
Park (Gingin Rd)	Low	Medium	High	High
Primary School	Low	Low	Medium	Medium
Tavern (Endeavour)	Low	Medium	High	High
Residential	Low	High	Very High	Very High

November 2017
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Coastal Hazard Risk Management and Adaptation Plan
Shire of Gingin
Appendix E: Risk Assessment Ratings and Results

LA4: Lancelin Township North of Lancelin Point

Assessment Inputs				
	2016	2030	2070	2110
Asset	Likelihood			
Beach	Possible	Likely	Almost Certain	Almost Certain
Coastal/dune vegetation	Possible	Likely	Almost Certain	Almost Certain
Residential	Rare	Unlikely	Possible	Likely
Beach Carpark (unsealed)	Rare	Unlikely	Possible	Likely
Beach Access (Lancelin Island Point)	Rare	Unlikely	Possible	Likely

Asset	Consequence of Erosion			
Impact on beach amenity	Minor	Moderate	Major	Major
Impact on ecological buffer	Minor	Moderate	Major	Major
Impact on residential lots	Minor	Moderate	Major	Major
Impact on beach carpark	Minor	Minor	Minor	Minor
Impact on beach access	Minor	Moderate	Moderate	Moderate

Asset	Adaptive capacity			
Beach	High	Moderate	Low	Low
Coastal/dune vegetation	High	Moderate	Low	Low
Residential	Low	Low	Low	Low
Beach Carpark (unsealed)	High	High	High	High
Beach Access (Lancelin Island Point)	High	High	High	High

Risk Assessment				
	2016	2030	2070	2110
	Risk			
Beach	Low	Medium	Extreme	Extreme
Coastal/dune vegetation	Low	Medium	Extreme	Extreme
Residential	Low	Medium	High	High
Beach Carpark (unsealed)	Low	Low	Low	Medium
Beach Access (Lancelin Island Point)	Low	Medium	Medium	Medium

	Vulnerability			
Beach	Low	Medium	Very High	Very High
Coastal/dune vegetation	Low	Medium	Very High	Very High
Residential	Low	High	Very High	Very High
Beach Carpark (unsealed)	Low	Low	Low	Medium
Beach Access (Lancelin Island Point)	Low	Medium	Medium	Medium

Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

F

MULTI-CRITERIA ANALYSIS RESULTS





Coastal and Risk Management Adaptation Plan
Shire of Gingin
Appendix F: MRE-Climate Analysis Results

SE1: Seabird Township South



Asset types
Preliminary long-term pathway
Vulnerability ranking and timeframe

Environmental, Social, Economic
Managed Retreat OR Protect

	2016	2030	2070	2110
	Vulnerability			
Beach	Low	High	Very High	Very High
Coastal/dune vegetation	Low	High	Very High	Very High
Residential (houses and land)	Very High	Very High	Very High	Very High
Carparks and roads	Low	High	High	High

Option Category	Option Code	Option Name	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Implication			Recommendation
			Effectiveness	Legal / Approval Status	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Cost	Capital Cost	Ongoing Cost	
Avoid	AV	Avoid development									Recommended
Managed Retreat	MR1	Leave unprotected / repair									Not recommended
	MR2	Remove / relocate									Investigate
	MR3	Planning controls for retreat									Recommended
Accommodate	AC1	Planning controls to accommodate risk									Recommended
	AC2	Emergency plans and controls									Recommended
	AC3	Re-design to withstand impact									Recommended
Protect	PR1	Dune care / sand management									Recommended
	PR2	Beach nourishment									Not recommended
	PR3	Croynes									Investigate
	PR4	Neighbourhood / breakwater									Not recommended
	PR5	Vegetation / extend seawall									Investigate
Do Nothing	DN	Do nothing									Not recommended

SB2: Seabird Township North

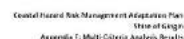


Asset types
Preliminary long-term pathway
Vulnerability ranking and timeframe

Environmental, Social, Economic
Managed Retreat OR Protect

	2016	2030	2070	2110
	Vulnerability			
Beach	Low	High	High	High
Coastal/dune vegetation	Low	Medium	High	Very High
Caravan Park (Seabird Private)	Low	Medium	Investigate	Very High
Tavern	Low	Medium	Medium	High

Option Category	Option Code	Option Name	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Implication			Recommendation
			Effectiveness	Legal / Approval Status	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Cost	Capital Cost	Ongoing Cost	
Avoid	AV	Avoid development									Recommended
Managed Retreat	MR1	Leave unprotected / repair									Not recommended
	MR2	Remove / relocate									Investigate
	MR3	Planning controls for retreat									Recommended
Accommodate	AC1	Planning controls to accommodate risk									Recommended
	AC2	Emergency plans and controls									Recommended
	AC3	Re-design to withstand impact									Recommended
Protect	PR1	Dune care / sand management									Recommended
	PR2	Beach nourishment									Not recommended
	PR3	Croynes									Investigate
	PR4	Neighbourhood / breakwater									Not recommended
	PR5	Seawall									Investigate
Do Nothing	DN	Do nothing									Not recommended



	2016	2019	2070	2110
	Vulnerability			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Negligible	Medium	High
Beach Carpark (unsealed)	Low	Low	Low	Medium
Road (unsealed)	Low	Low	Low	Low

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	2016	2030	2070	2110
	Vulnerability			
Beach	Medium	Medium	High	High
Foreshore recreation area	Low	Low	Medium	High
Residential	High	Very High	Very High	Very High
Roads	Low	Low	Med	Medium

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Coastal Hazard Risk Management Adoption Plan
Shire of Gingin
Appendix 4 - Multi-criteria Analysis Results

LP3: Ledge Point Township North



Asset type: Social, Economic, Environmental
Preliminary long term pathway: Avoid and Accommodate (then Managed Retreat OR Protect)
Vulnerability ranking and timeframe:

	2016	2030	2070	2110
Vulnerability				
Beach	Low	Low	Medium	High
Coastal/dune vegetation	Low	Medium	Medium	Medium
Campark (De Burgh St)	Low	Low	Medium	High
Road (De Burgh St)	Low	Low	Medium	High
Holiday Village	Low	Low	High	Very High
Residential	Low	Low	Very High	Very High
Key Biscayne Park	Low	Low	Medium	Very High

Option Category	Option Code	Option Name	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Indication		Recommendation	
			Effectiveness	Legal / Approval Risk	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Costs	Capital Cost		Ongoing Cost
Avoid	AV	Avoid development									Recommended
Managed Retreat	MR1	Leave unprotected / repair									Not recommended
	MR2	Remove / relocate									Investigate
	MR3	Planning controls for retreat									Recommended
Accommodate	AC1	Planning controls to accommodate risk									Recommended
	AC2	Emergency plans and controls									Recommended
Protect	PR1	Dune care / sand management									Recommended
	PR2	Beach nourishment									Investigate
	PR3	Groynes									Investigate
	PR4	Neonshore reef / breakwater									Not recommended
	PR5	Seawall									Investigate
Do Nothing	DN	Do nothing									Not recommended

LP4: Ledge Point North of Township



Asset type: Environmental, Social
Preliminary long term pathway: Avoid / Accommodate
Vulnerability ranking and timeframe:

	2016	2030	2070	2110
Vulnerability				
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Medium	Medium	Medium
Campark (unsealed)	Low	Low	Low	Low
Road (unsealed)	Low	Low	Low	Low

Option Category	Option Code	Option Name	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Indication			Recommendation
			Effectiveness	Legal / Approval Risk	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Cost	Capital Cost	Ongoing Cost	
Avoid	AV	Avoid development									Recommended
Managed Retreat	MR1	Leave unprotected / repair									Recommended
	MR2	Remove / relocate									
	MR3	Planning controls for retreat									Recommended
Accommodate	AC1	Planning controls to accommodate risk									Recommended
	AC2	Emergency plans and controls									Recommended
Protect	PR1	Dune care / sand management									Recommended
	PR2	Beach nourishment									Not recommended
	PR3	Groynes									Not recommended
	PR4	Neonshore reef / breakwater									Not recommended
	PR5	Seawall									Not recommended
Do Nothing	DN	Do nothing									Not recommended



Coastal Hazard Risk Management Implementation Plan
Shire of Gingin
Appendix 1: Multi-Criteria Analysis Results

LA1: Lancelin South of Township



Asset types: Social, Environmental, Economic
Preliminary long term pathway: Managed Retreat OR Protect
Vulnerability ranking and timeframe

	2014	2030	2070	2110
	Vulnerability			
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Low	Medium	Medium
Caravan (Black Beach)	Low	Low	Low	Low
Caravan Park (Lancelin South End)	Medium	Medium	High	Very high
Sea Rescue	High	High	Very high	Very high
Gerse Darling Park	High	High	Very high	Very high

Option Category	Option Code	Option Name	Preliminary Feasibility		Preliminary Acceptability		Preliminary Financial Implication		Recommendation
			Efficiency	Legal / Approved / Risk	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Cost	
Avoid	AV	Avoid development							Recommended
	MR1	Leave unprotected / repair							Not recommended
Managed Retreat	MR2	Remove / relocate							Investigate
	MR3	Planning controls for retreat							Recommended
Accommodate	AC1	Planning controls to accommodate risk							Recommended
	AC2	Emergency plans and controls							Recommended
Protect	PR1	Dune care / sand management							Recommended
	PR2	Beach nourishment							Investigate
	PR3	Groynes							Investigate
	PR4	Neemshore reef / breakwater							Not recommended
	PR5	Seawall							Investigate
Do Nothing	DN	Do nothing							Not recommended

LA2: Lancelin Township South of Jetty



Asset types: Environmental
Preliminary long term pathway: Avoid and Accommodate, then Managed Retreat (OR Protect)
Vulnerability ranking and timeframe

	2014	2030	2070	2110
	Vulnerability			
Beach	Low	Medium	High	Very high
Coastal/dune vegetation	Low	Medium	High	Very high
Residential	Low	Low	High	Very high
Road (Cumille St)	Low	Low	Medium	High
Jetty	Low	Medium	High	High
Light Industrial	Low	Low	Medium	High
Café	Low	Low	Medium	High

Option Category	Option Code	Option Name	Preliminary Feasibility		Preliminary Acceptability		Preliminary Financial Implication		Recommendation
			Efficiency	Legal / Approved / Risk	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Cost	
Avoid	AV	Avoid development							Recommended
	MR1	Leave unprotected / repair							Not recommended
Managed Retreat	MR2	Remove / relocate							Investigate
	MR3	Planning controls for retreat							Recommended
Accommodate	AC1	Planning controls to accommodate risk							Recommended
	AC2	Emergency plans and controls							Recommended
Protect	PR1	Dune care / sand management							Recommended
	PR2	Beach nourishment							Investigate
	PR3	Groynes							Investigate
	PR4	Neemshore reef / breakwater							Not recommended
	PR5	Seawall							Investigate
Do Nothing	DN	Do nothing							Not recommended



Coastal Hazard Risk Management Adaptation Plan
Shire of Gingin
Appendix F: Multi-Criteria Analysis Results

LA3: Lancelin Township Jetty to Lancelin Point



Asset types
Preliminary long-term pathways
Vulnerability ranking and timeframes

Economic, Social, Environmental

Avoid and Accommodate, then Managed Retreat OR Protect

	2015	2030	2070	2110
	Vulnerability			
Beach	NA	Medium	High	Very High
Coastal/dune vegetation	NA	Medium	High	Very High
Road (Gingin Rd)	NA	Medium	Medium	Medium
Caravan Park (Lancelin North End)	NA	Medium	High	High
Hotel & Restaurant	NA	Medium	High	High
Park (Gingin Rd)	NA	Medium	High	High
Primary School	NA	Low	Medium	Medium
Tavern (Endeavour)	NA	Medium	High	High
Residential	NA	High	Very High	Very High

Option Category	Option Code	Option Name	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Implication		Recommendation
			Effectiveness	Legal / Approval Risk	Reversibility / Adaptability	Environmental / social impact	Community Acceptability	Economic gain / Avoidance of Cost	Capital Cost	
Avoid	AU	Avoid development								Recommended
Managed Retreat	MR1	Leave unprotected / repair								Not recommended
	MR2	Remove / relocate								Investigate
	MR3	Planning controls for retreat								Recommended
Accommodate	AC1	Planning controls to accommodate risk								Recommended
	AC2	Emergency plans and controls								Recommended
Protect	PR1	Dune care / sand management								Recommended
	PR2	Beach nourishment								Investigate
	PR3	Groynes								Investigate
	PR4	Nearshore reef / breakwater								Not recommended
	PR5	Seawall								Investigate
Do Nothing	DN	Do nothing								Not recommended

LA4: Lancelin Township North of Lancelin Point



Asset types
Preliminary long-term pathways
Vulnerability ranking and timeframes

Economic, Social, Environmental

Avoid and Accommodate, then Managed Retreat OR Protect

	2015	2030	2070	2110
	Vulnerability			
Beach	NA	Medium	Very High	Very High
Coastal/dune vegetation	NA	Medium	Very High	Very High
Residential	NA	High	Very High	Very High
Beach Carpark (unsealed)	NA	Low	Low	Medium
Beach Access (Lancelin Island Point)	NA	Medium	Medium	Medium

Option Category	Option Code	Option Name	Preliminary Feasibility			Preliminary Acceptability		Preliminary Financial Implication		Recommendation
			Effectiveness	Legal / Approval Status	Reversibility / Adaptability	Environmental / Social Impact	Community Acceptability	Economic gain / Avoidance of Cost	Capital Cost	
Avoid	AU	Avoid development								
Managed Retreat	MR1	Leave unprotected / repair								Recommended
	MR2	Remove / relocate								Not recommended
	MR3	Planning controls for retreat								Investigate
Accommodate	AC1	Planning controls to accommodate risk								Recommended
	AC2	Emergency plans and controls								Recommended
Protect	PR1	Dune care / sand management								Recommended
	PR2	Beach nourishment								Investigate
	PR3	Groynes								Investigate
	PR4	Nearshore reef / breakwater								Not recommended
	PR5	Seawall								Investigate
Do Nothing	DN	Do nothing								Not recommended

Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

G

MULTI-CRITERIA ANALYSIS SUMMARY



Appendix G
Multi-Criteria Analysis Summary

Table G1 Summary of multi-criteria analysis

Description	Avoid	Managed Retreat			Accommodate		Protect					Do Nothing	Risk Priority	Preliminary long term pathway	Decision timeframe
	AV	MR1	MR2	MR3	AC1	AC2	PR1	PR2	PR3	PR4	PR5	DN			
SE1: Seabird Township South	R	NR	I	R	R	R	R	NR	I	NR	I	NR	High	Managed Retreat or Protect	Short term
SE2: Seabird Township North	R	NR	I	R	R	R	R	NR	I	NR	I	NR	Medium	Managed Retreat or Protect	Medium term
LP1: Ledge Point South of Township	R	R	N/A	R	R	R	R	NR	NR	NR	NR	NR	Low	Avoid	Not Required
LP2: Ledge Point Township South	R	NR	I	R	R	R	R	I	I	NR	I	NR	High	Managed Retreat or Protect	Short term
LP3: Ledge Point Township North	R	NR	I	R	R	R	R	I	I	NR	I	NR	Medium	Managed Retreat or Protect	Medium term
LP4: Ledge Point North of Township	R	R	N/A	R	R	R	R	NR	NR	NR	NR	NR	Low	Avoid	Not Required
LA1: Lancelin South of Township	R	NR	I	R	R	R	R	I	I	NR	I	NR	High	Managed Retreat or Protect	Short term
LA2: Lancelin Township South of Jetty	R	NR	I	R	R	R	R	I	I	NR	I	NR	Medium	Managed Retreat or Protect	Medium term
LA3: Lancelin Township Jetty to Lancelin Point	R	NR	I	R	R	R	R	I	I	NR	I	NR	Medium	Managed Retreat or Protect	Medium term
LA4: Lancelin Township North of Lancelin Point	R	NR	I	R	R	R	R	I	I	NR	I	NR	Medium	Managed Retreat or Protect	Medium term

AV: Avoid development
 MR1: Leave unprotected / repair
 MR2: Remove / relocate
 MR3: Planning controls for retreat
 AC1: Planning controls to accommodate risk
 AC2: Emergency plans and controls

PR1: Dune care program / Sand management
 PR2: Beach Nourishment
 PR3: Groyne
 PR4: Nearshore Reef / Breakwater
 PR5: (Maintain / extend) Seawall

NR: Not recommended
 I: Investigate (High Priority Areas - see Adaptation Options in Chapter 5)
 R: Recommended (See Implementation Plan - Chapter 6)

**Table G2 SE1: Seabird Township South**

	MR2 - Remove / relocate	PR3 - Groynes	PR5 - Seawall
Effectiveness	Removal of houses to the west of the natural limestone ridge would be effective in lowering the risk of erosion.	The effectiveness of groynes in maintaining a beach would need to be assessed in greater detail. Ongoing sand renourishment may be required.	Maintenance of the seawall would be effective in lowering the risk of erosion impacts to assets landward of the seawall.
Legal / Approval Risk	At present the mechanisms for implementing managed retreat are not well understood, and may involve legal risk.	Implementing groynes may increase the risk of long term erosion in management unit SE2, thereby exposing responsible entities to future legal action in the event of injurious affection.	The presence of the seawall may increase the risk of long term erosion in management unit SE2, thereby exposing responsible entities to future legal action in the event of injurious affection.
Reversibility / Adaptability	Managed retreat of assets from the hazard zone is the best way of preserving future options for adaptation.	Protective structures tend to encourage investment and intensification of development based on the belief that property will be protected into the future (see Section 1.6). This option is therefore difficult to reverse and limits future adaptation options.	Protective structures tend to encourage investment and intensification of development based on the belief that property will be protected into the future (see Section 1.6). This option is therefore difficult to reverse and limits future adaptation options.
Environmental / Social Impact	Removal of assets and allowing erosion to occur may be considered to have the best environmental outcomes since this is the most natural course of action. Managed retreat would allow for public access to a foreshore reserve and restore use of the beach.	Groynes have the potential to result in negative impacts to benthic habitats, but also have the potential to create new habitat and substrate for marine flora and fauna. The potential environmental impacts from groynes would need to be assessed in greater detail. If successful in creating beach amenity then this would have positive social impacts.	Increased erosion of SE2 would be a negative environmental impact. Maintenance of the seawall would continue to reduce the public amenity of the coast in front of the seawall.
Community Acceptability	This option is likely to be highly unacceptable to the landowners west of the 2030 hazard line, and of limited acceptability to the rest of the Seabird community.	This option is likely to be acceptable to the landowners west of the 2030 hazard line as well as the rest of the Seabird community, however the level of cost contribution required may make this option unacceptable.	This option is likely to be most acceptable to the landowners west of the 2030 hazard line and the rest of the seabird community.
Financial Gain / Avoidance of Cost	This option avoids the cost of seawall maintenance.	This option does not provide immediate financial gain to the broader community, however it may make Seabird a more desirable area thereby stimulating development, increasing tourism potential and raising house values.	This option provides financial gain primarily for landowners west of the 2030 hazard line. Increased public amenity relating to the seawall would be required to broaden the beneficiary base.
Capital Cost	Compensation to the 16 landowners within the 2030 hazard zone could cost in the order of \$16 M.	This option is likely to be prohibitively expensive (estimated best practice approach: \$9M) for the ratepayer base of around 200.	N/A



	MR2 - Remove / relocate	PR3 - Groynes	PR5 - Seawall
Ongoing Cost	Expected to be negligible.	Ongoing cost is expected to be around twice that of a seawall alone (\$44,000 p/a)	Estimated \$24,000 p/a.

Table G3 LP2: Ledge Point Township South

	PR2 - Beach Nourishment	MR2 - Remove / relocate	PR3 - Groynes	PR5 - Seawall
Effectiveness	May reduce risk but residual risk from extreme events would remain. Ongoing nourishment would be required.	Removal of houses seaward of DeBurgh St would reduce the consequences of erosion.	Additional groynes are likely to be effective if sand renourishment is also carried out. The effectiveness of extension of the existing groynes needs to be assessed in greater detail.	Construction of a seawall would be effective in lowering the risk of erosion impacts to assets landward of the seawall.
Legal / Approval Risk	This option is expected to have minimal legal risk.	At present the mechanisms for implementing managed retreat are not well understood, and may involve legal risk.	Implementing groynes may increase the risk of long term erosion in adjoining areas, potentially posing a legal risk.	Construction of a seawall may increase the risk of long term erosion in adjacent management units, thereby exposing responsible entities to future legal action in the event of injurious affection.
Reversibility / Adaptability	This option is highly reversible.	Managed retreat preserves future options for adaptation.	This option is difficult to reverse and limits future adaptation options.	This option is difficult to reverse and limits future adaptation options.
Environmental / Social Impact	Environment impacts are likely to be minimal. Social impacts on beach use may be experienced during construction and may alter the nature of the beach and impact on boat launching activities.	Managed retreat may be considered to have the best environmental outcomes since this is the most natural course of action. Removal of assets and creation of a foreshore reserve would increase public access to the beach.	The potential environmental impacts from groynes would need to be assessed in greater detail. Additional groynes may restrict vehicle access along the beach.	Increased erosion of adjacent management units would be a negative environmental impact. Construction of a seawall may reduce the public amenity of the coast in front of the seawall.
Community Acceptability	Moderate acceptability unless current beach use is significantly impacted.	This option is likely to be unacceptable to the specific landowners required to remove assets/relocate, and be of limited acceptability to the broader Ledge Point community.	This option is likely to be acceptable so long as existing use of the beach can be maintained.	This option may be acceptable so long as existing use of the beach can be maintained.

Appendix G
Multi-Criteria Analysis Summary

	PR2 - Beach Nourishment	MR2 - Remove / relocate	PR3 - Groynes	PR5 - Seawall
Financial Gain / Avoidance of Cost	Minimal financial gain anticipated.	This option avoids the cost of coastal protection works.	This option provides financial gain for landowners along DeBurgh Street. This option does not provide immediate financial gain to the broader community, but may raise property values.	This option provides financial gain primarily for landowners west of DeBurgh Street.
Capital Cost	\$1.46m for same volume as with groynes but could be considerably less	Compensation to the landowners west of DeBurgh St could cost in the order of \$23 million.	Estimated to be \$3.9 M for 2 groynes and sand nourishment.	Estimated \$1.2 M for 290 m long seawall.
Ongoing Cost	Estimated \$40,000 p/a	Expected to be negligible.	Estimated \$19,500 p/a.	Estimated \$13,500 p/a.

Table G4 LA1: Lancelin South of Township

	PR2 - Beach Nourishment	MR2 - Remove / relocate	PR3 - Groynes	PR5 - Seawall
Effectiveness	Ongoing nourishment would be required to be effective.	Removal of Grace Darling Park and chalets in the caravan park would reduce the consequences of erosion.	The effectiveness of groynes in this location would need to be assessed in greater detail.	Construction of a seawall would be effective in lowering the risk of erosion impacts to assets landward of the seawall.
Legal / Approval Risk	This option is expected to have minimal legal risk.	Minimal legal risk.	Implementing groynes may increase the risk of long term erosion in adjoining areas, thereby potentially exposing responsible entities to future legal action.	Construction of a seawall may increase the risk of long term erosion in adjacent areas, thereby potentially exposing responsible entities to future legal action.
Reversibility / Adaptability	This option is highly reversible	Managed retreat preserves future options for adaptation	This option is difficult to reverse and limits future adaptation options.	A rock sea wall option is difficult to reverse and limits future adaptation options. GSC are more easily reversible with fewer negative impacts.
Environmental / Social Impact	Environment impacts are likely to be minimal. Social impacts on beach use may be experienced	Managed retreat may be considered to have the best environmental outcomes since this is the most natural course of action.	The potential environmental impacts from groynes would need to be assessed in greater detail. Social impacts may occur if groynes have a negative impact on tourism due	Increased erosion of adjacent dune areas may result. Seawalls may reduce the public amenity of the beach in front of the seawall.



Appendix G
Multi-Criteria Analysis Summary

	PR2 -Beach Nourishment	MR2 - Remove / relocate	PR3 - Groynes	PR5 - Seawall
	during sand relocation activities.	Social impacts may occur if no allowance for a foreshore reserve with public/tourism access to key areas.	to changes to natural character of the area.	
Community Acceptability	High acceptability.	Community acceptability will depend on provision of a foreshore reserve with public access to key recreation areas.	This option is unlikely to be acceptable as it would substantively change the character of the area.	The GSC option may be acceptable so long as existing use of the beach can be maintained. The rock option is unlikely to be acceptable.
Financial Gain / Avoidance of Cost	Minimal direct financial gain, but some flow-on economic benefits.	This option avoids the cost of coastal protection works.	This option does not provide immediate financial gain to the broader community	This option may provide some financial gain to the broader community so long as the beach and connection to it can be maintained.
Capital Cost	\$5.88m for same volume as with groynes but could be less if no groynes constructed.	N/A	Estimated to be \$12 M for 4 groynes and sand renourishment. Smaller scale options in the vicinity of Grace Darling Park might cost considerably less.	Estimated \$2.7 M for 700 m long rock seawall or \$700 -\$900 K for 150 m long GSC revetment.
Ongoing Cost	\$48,000 or less if sand is sourced from the nearby salient sand spit.	Expected to be negligible.	Estimated \$39,000 p/a	Estimated \$29,700 p/a.

Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

H

PLANNING CONTROLS DISCUSSION



H PLANNING CONTROLS DISCUSSION

H1 When Planning Controls are Required

As climate change and sea level rise are not 100% predictable, risk assessments are based on likelihood rather than certainty. The clear challenge for responsible planning near the coast is managing development in a way that does not prematurely sterilise otherwise suitable land from being sensitively used. At the same time, the local government must not create a future legal or financial liability by permitting development that is likely to become vulnerable to damage from erosion or inundation.

Planning controls are appropriate to locations affected by coastal processes where avoidance or managed retreat responses are recommended. They are not generally necessary for sites where 'protect' responses are adopted.

The classification of land in a local planning scheme is one of the key planning tools available to manage the use of land. Through the classification of land, land uses and land use intensity can be controlled.

Local planning schemes zone or reserve land for various purposes, and may additionally incorporate 'overlays' that indicate special requirements applicable to affected land regardless of the zone or reserve.

Most land within scheme areas is zoned. Depending on the zone applied, certain land uses may be permitted or excluded, and different development standards or other requirements may apply. Land is generally only 'reserved' in planning schemes to serve some public purpose. For example, foreshore reserves and parks will usually be reserved, as will civic and community uses and important infrastructure such as service utilities and major transport corridors. Reservation of land in a local planning scheme doesn't necessarily mean it is or will ever be publicly owned, although it often is.

The classification of land in a local planning scheme creates expectations for owners and the wider community about what may be permitted to be developed on that land. Therefore, it is preferable for planning schemes to classify land in a way that makes it clear that any further development of land at risk from coastal processes can only occur if the local government considers it to be acceptable in the light of the policy of planned (or managed) retreat. Hence it is important to indicate on scheme maps those areas that are considered to be at risk.

The draft Planned or Managed Retreat Guidelines (WAPC 2017) provide guidance for the preparation of policy for planned or managed retreat, which is based on the principles of social, environmental and economic sustainability and the objectives of the State Coastal Policy. The principles underpin the planning response to coastal risk management and adaptation. The principles are:

- a) To ensure land in the coastal zone is continuously provided for coastal foreshore management, public access, recreation and conservation;
- b) To ensure public safety and reduce risk associated with coastal erosion and inundation;
- c) To avoid inappropriate land use and development of land at risk from coastal erosion and inundation; and
- d) To ensure land use and development does not accelerate coastal erosion or inundation risks, or have a detrimental impact on the functions of public reserves.

Not all adaptation and management responses require a planning control. It is necessary to understand that local planning schemes and other planning mechanisms can only address some matters, including those that fall within the definition of 'development' as defined by the Planning and Development Act 2005, that is:

"development or use of any land, including:

- (a) any demolition, erection, construction, alteration of or addition to any building or structure on the land;



- (b) the carrying out on the land of any excavation or other works;
- (c) in the case of a place to which a Conservation Order made under section 59 of the Heritage of Western Australia Act 1990 applies, any act or thing that —
 - (i) is likely to change the character of that place or the external appearance of any building; or
 - (ii) would constitute an irreversible alteration of the fabric of any building."

Planning controls include provisions in the local planning scheme relating to certain land use designations and/or development types, preferably supported by appropriate local planning policy or policies to describe the Shire's intentions and the principles that will guide decision making on the matters covered.

H2 Types of Planning Control

Planning controls that may be considered include:

- > Zoning or reservation of land in the Local Planning Scheme;
- > Special Control Areas;
- > Local Planning Policies;
- > Structure Plans;
- > Approval Conditions.

H2.1 Zones and Reserves

Zones allow for private land uses within the development parameters permitted by the local planning scheme and any related planning policies. Typical zones adjacent to the coast are Residential, Tourism, and Commercial.

Ideally, land at risk from coastal hazards would be contained within a foreshore reserve classified in the local planning scheme for either Parks and Recreation, or Environmental Conservation. However, in practice this may not be appropriate over privately-owned land because local planning schemes reserves typically preclude development for private purposes, and refusal of an application for private development would trigger a claim for compensation that the Shire could ill afford. Furthermore, prohibiting development in the short-term may not be necessary if the risk is forecast to be longer term and beyond the economic life of the proposed development.

Therefore, rather than reserving vulnerable land, the planning recommendations in this CHRMAP seek to facilitate appropriate development on private land according to the applicable zone, for as long as the land and the development can exist without adversely impacting public amenity and safety, and without unacceptable risk to the users of the development or neighbouring developments and land. The most appropriate way of doing this is through the application of a special control area (see 1.2.2), which is an 'overlay' to the zone (and/or reserve).

H2.2 Special Control Areas

Where land has been assessed as being vulnerable to coastal processes, a Special Control Area (SCA) is the most appropriate classification of land to facilitate land use change and development control, and is preferred by the WAPC as outlined in the draft Planned or Managed Retreat Guidelines.

Special Control Areas apply to land that is significant for some reason (in this case, vulnerability to coastal processes) and where special provisions in the scheme may need to apply. An SCA is shown on the scheme map as an overlay to the zones and reserves, and the special provisions related to the issue apply in addition to the provisions of the underlying zones and reserves. The provisions set out the purpose and objectives of the SCA, any specific development requirements, the process for referring applications to relevant agencies, and matters to be considered in determining development proposals.



Appendix H
Planning Controls Discussion

Within an SCA the Shire can mandate that all development requires approval including development that is normally exempt from planning approval (eg: ordinarily single houses don't require planning approval). This ensures that only development that the Shire considers to be acceptable to the assessed risk can take place.

An SCA can also provide for time limited planning approvals (ie: temporary approval), which is discussed further in 1.2.4.2.

The draft Planned or Managed Retreat Guidelines provide recommended wording for scheme text relating to a SCA, which is reproduced in XX.

H2.3 Structure Plans

A structure plan is a plan for the coordination of future subdivision and zoning of an area of land. If comprehensive redevelopment of land is an option, a structure plan should be required before subdivision or development can take place.

Deemed provision 15 of TPS 9 sets out when a structure plan may be prepared, in the following terms:

A structure plan in respect of an area of land in the Scheme area may be prepared if —

- (a) the area is —
 - (i) all or part of a zone identified in this Scheme as an area suitable for urban or industrial development; and
 - (ii) identified in this Scheme as an area requiring a structure plan to be prepared before any future subdivision or development is undertaken; or
- (b) a State planning policy requires a structure plan to be prepared for the area; or
- (c) the Commission considers that a structure plan for the area is required for the purposes of orderly and proper planning.

Other deemed provisions set out the procedure for preparing structure plans. Structure plans consider a range of matters including land requirements to accommodate coastal risks in compliance with the requirements of the State Coastal Planning.

In LPS 9, structure plans are required on land zoned 'Future Development'. It is for this reason that a structure plan was prepared for Moore River South and other areas further inland.

Local structure plans typically indicate future proposed zones and reserves. A foreshore reserve of adequate dimensions to accommodate coastal processes can be identified, to ensure that there will still be a public foreshore reserve even when the extent of forecast erosion is reached.

Structure plans are not statutory documents but the deemed provisions of local planning schemes in the Planning and Development (Local Planning Schemes) Regulations 2015 set out the way they are to be prepared and adopted, and confer a requirement on decision makers to have due regard to them when determining development under the planning scheme.

Structure plans have a life of 10 years from the date of approval (or until 19 October 2025 if they were approved before the Planning and Development (Local Planning Schemes) Regulations 2015 came into force). In due course and as the structure plan is implemented it is expected that reserves and zones shown in the structure plan will be reflected in the local planning scheme via a scheme amendment.

H2.4 Approval Conditions

Provided they are justified and reasonable in relation to the proposal, the decision maker can apply conditions to approvals for subdivision or development. The WAPC is responsible for determining applications for subdivision and in doing so will consult with the local government and consider relevant State Planning Policies including the State Coastal Policy. Applications for development approval are the responsibility of the local government or, where the value of the proposed development exceeds



the defined threshold, by the Mid-West/Wheatbelt (Central) Joint Development Assessment Panel (JDAP).

Two possible types of condition of particular relevance to land at risk from coastal processes are to require a notification to be placed on the Title of the land, and to place a time limit on the approval (so that the approval will expire after a defined period).

Notifications on Title

Notifications on Title are made to alert owners and potential purchasers of something that applies to the land but which may not be apparent from inspection of the land. The threat of future coastal hazards is a matter that would not be apparent on land unless it had already been eroded.

A notification on the Certificate of Title will ensure that existing and any future landowners (Successors in Title) are made aware of the risk of possible impacts on the land from coastal processes. Owners and potential purchasers would then be able to make an informed decision about the level of risk they are prepared to take on. The notification would also inform them that some form of adaptation or management is likely to be required.

There are two mechanisms by which a notification can be placed on a Certificate of Title:

- > Section 165 of the Planning and Development Act 2005; and
- > Section 70A of the Transfer of Land Act 1897.

Under Section 165 of the Planning and Development Act 2005 it is the WAPC's responsibility to determine the need for a notification, and to place a condition on a subdivision proposal if necessary. New titles could not then be created until the notification had been placed.

Alternatively, under Section 70A of the Transfer of Land Act 1897 a notification may be lodged to the benefit of a local government or public authority. Such a notification must include the signature of the registered landowner to signify agreement with the notification being lodged. A condition could be placed upon a development approval, if appropriate, to require such a notification to be placed on the Title. Development would then not be able to proceed unless the notification was placed by the landowner/developer.

When there is no application for subdivision or development that could trigger a condition requiring a notification on the Title, it would be necessary to negotiate with landowners to achieve a notification under the Transfer of Land Act. A fee would be payable for each instance, unless a waiver of the fee could somehow be achieved.

Time Limited Approvals

A time limit can be applied to a development approval. For example, if a development is proposed on land that is forecast to be affected by coastal processes in say 30 years, an approval might be limited to within that timeframe. An application for a new approval could be sought at the end of that period and it would be assessed based on the information on risk available at that time. The condition may also identify an 'event trigger' to further limit an approval in case the hazard occurs sooner than predicted.

It is more acceptable to apply a time limit to a development approval where the scheme provides for the possibility, such as would be the case for an SCA for planned retreat.

Time limits on subdivision of land are not possible, as once new Titles are created they can't be extinguished without a lengthy and expensive process of resumption (or 'taking' as it is also known). Hence it is recommended that further subdivision of vulnerable land not be permitted.

H3 Management Responses and Planning Controls

Possible types of planning control relevant to these management responses are described in the following paragraphs.

H3.1 Avoid



Appendix H
Planning Controls Discussion

Avoiding development means prohibiting development from taking place in locations identified as being at potential risk from coastal hazards.

This can be achieved by zoning or reserving the land to preclude development. If the appropriate zone does not already apply to the land, a scheme amendment would be required to change the designation of the land and introduce any necessary provisions.

Types of scheme amendments to achieve this outcome are discussed further in XX.

H3.2 Accommodate

Accommodation options recognise that there is a hazard, but do not prohibit development. Instead, depending on the nature of the hazard and the timeframe within which it is expected to occur, development may be permitted within defined parameters.

For example, if inundation of land is anticipated it may be acceptable to have development that can accommodate occasional inundation by having a finished floor level that keeps habitable parts of buildings above the expected high-water level. How this elevated floor level is achieved will depend on the particular characteristics of the location but may involve buildings being raised on 'stilts' that allow flood waters to flow underneath with relative ease, or by raising the ground level with suitable fill and protection so that floor levels remain above predicted flood levels.

The local planning scheme will need to identify where these controls would apply, and a local planning policy could outline the types of building that the Shire would be prepared to consider to achieve its objectives. In framing local planning controls, care should be taken not to inadvertently exclude innovative alternative solutions that can be shown to be effective.

An alternative scenario could be to acknowledge that the land might be subject to erosion in the future, but that the planning horizon is sufficiently far off that temporary development could be acceptable until such time as the threat of erosion becomes imminent. In such a situation certain types of construction might be acceptable (eg: transportable or easily dismountable), and/or certain types of development only might be permitted (eg: short term accommodation and tourism activities).

Again, the planning scheme will have to identify these areas and the types of development that will be permitted. A supporting local planning policy could detail the Shire's expectations for the design and/or management of temporary development.

A scheme amendment would be required to introduce any necessary provisions and if necessary to rezone or change the designation of the land. Types of scheme amendments to achieve this outcome are discussed further in XX.

Additionally, notification on the Title of affected land would be advisable so that the owner and/or future owners are aware of the requirements. This is discussed further in 1.2.4.1.

H3.3 Managed Retreat

Existing development would be permitted to remain for as long as it remains unaffected by coastal hazards, but new development or expansion of existing development would not be permitted as intensification of development would mean more assets at risk. Approval of any development would be time limited, based on the forecast hazard timeframe.

H4 LPS 9 Recommendations

The following sections provide recommendations for incorporation into LPS 9 or any new planning scheme.

H4.1 Introduce a Special Control Area

LPS 9 should be immediately amended to include zoned land seaward of the forecast 2110 hazard line within a Special Control Area (SCA). Where the hazard line cuts across a lot less than one hectare in area, the whole of the cadastral boundary of that lot should be included in the SCA.



Appendix H
Planning Controls Discussion

Within the SCA development approval would be required for any new development including single houses, outbuildings, fences, retaining walls, and additions or extensions or other structural modifications to existing buildings.

Any new development approved should have a time limit placed upon it, after which time the development should be removed by the landowner unless a subsequent new approval is applied for and granted for a further period. The length of the approval should be related to the forecast hazard lines

Serious consideration should be given to not permitting (avoiding) any new development at all forward of the 2020 hazard line (where this is defined) or the 2030 hazard line (where no 2020 line is defined). If development is contemplated in such areas then it would be preferable not to permit permanent accommodation due to the relatively short timeframe within which serious impacts can be expected.

No development should be permitted on any vacant land between the 2030 and 2110 hazard lines that is not:

- (a) capable of accommodating short term inundation that may result from storm surges; and
- (b) capable of being relocated if necessary.

The former may involve elevated finished floor levels with 'stilt' construction that will allow water to flow under and around the structure with minimal disturbance. The latter may involve 'lightweight' construction that could be readily disassembled and relocated if necessary.

The Shire may also require a local development plan (LDP) on specific areas of undeveloped land within the SCA to provide detailed guidance for the location and/or construction of any development that may be contemplated. An LDP is a plan that sets out specific and detailed guidance for a future development including one or more of the following —

- (a) site and development standards that are to apply to the development;
- (b) specifying exemptions from the requirement to obtain development approval for development in the area to which the plan relates.

Recommended wording for an SCA for Coastal Processes is provided by the WAPC within the draft *Planned and Managed Retreat Guidelines* (2017).

H4.2 Local Planning Policy for Coastal Development

A Local Planning Policy (LPP) should be developed and adopted using the procedures of Division 2 of the deemed provisions of LPS 9. Such a policy would cover matters such as the acceptable forms of 'temporary' construction within land forecast to be impacted by coastal processes. The existing LPPs 1.2 and 1.4 do not address these matters and should be updated or replaced with a more comprehensive policy that complements the State Coastal Policy.

A separate corporate policy for temporary development on coastal foreshore reserves might be appropriate to guide the Shire's own operations (eg: provision of beach shelters and other public amenities).

To provide guidance for future planning by the Shire and private landowners it is recommended that the Shire identify a default minimum distance required to accommodate public amenity within any foreshore reserve, for inclusion in the LPP. Depending on the location and purpose of the foreshore reserve public amenities may include beach access, car parking, picnic/barbeque facilities, public toilets, beach kiosks, etc, and the minimum distance required to fit them in will vary accordingly. This allowance for public amenity should be added to the 2110 hazard line to delineate an indicative minimum distance from the coast for the landward boundary of future planning scheme coastal reserves.

H4.3 Subdivision

Undeveloped parcels of zoned or reserved land lying seaward of the 2110 hazard line should not be permitted to be further subdivided. Subdivision includes strata titling. Time limited leasehold might be acceptable in situations where an appropriate temporary development necessitates a smaller parcel of



land for management purposes, however this should be carefully considered and only contemplated where there are demonstrable benefits of the proposed development for the community. A lease has a defined expiry date and does not result in permanent fragmentation of the landholding.

Where a structure plan is prepared, coastal foreshore reserve boundaries should be determined in accordance with Section 5.9 of the Coastal Planning Policy, and include an allowance for coastal processes as well as future public amenity at the end of the planning timeframe (2110). This recommendation is also consistent with Section 5.2(i) of the Coastal Planning Policy which encourages urban development around existing settlements and discourages continuous linear urban development along the coast.

H4.4 Reserved Land

Where Crown Land (including reserves as defined under the Land Administration Act 1997) is forecast to be impacted by coastal hazards, the foreshore Parks and Recreation reserve in LPS 9 should be extended as described above. Publicly owned freehold land that is not developed should similarly be included in the foreshore reserve, if possible. In either case this would be subject to negotiation with the public agency that has the management order (in the case of Crown Land) or that owns it (in the case of freehold land) and the Lands section of the Department of Planning, Lands and Heritage.

Shire of Gingin
Coastal Hazard Risk Management
and Adaptation Plan

APPENDIX

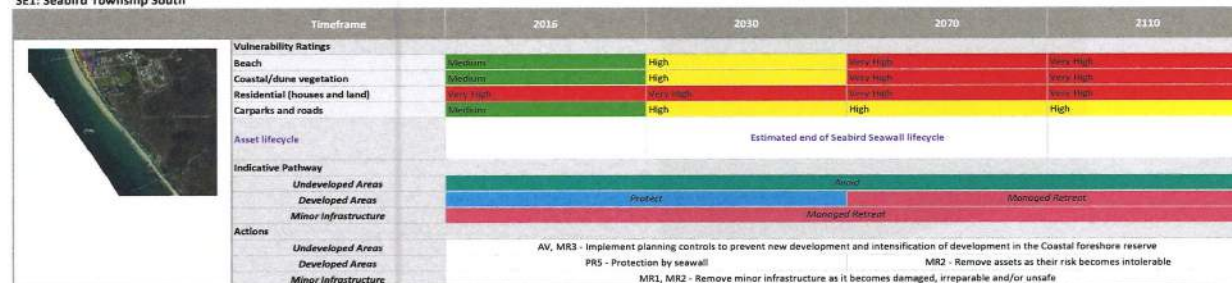


LONG TERM PATHWAYS






SE1: Seabird Township South



Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus \$1 reaches 2030 vulnerability line	HSD plus \$1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Retrofit seawall, commence dune care program	Remove damaged assets and relocate assets at risk	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



SE2: Seabird Township North

	Timeframe	2016	2030	2070	2110
	Vulnerability Rating				
	Beach	Low	High	High	High
	Coastal/dune vegetation	Low	Medium	High	Very High
	Caravan Park (Seabird Private)	Low	Medium	Very High	Very High
	Tavern	Low	Medium	Medium	High
	Asset lifecycle			Estimated end of Caravan Park lifecycle	
	Pathways				
	Undeveloped Areas	Protect			
	Developed Areas	Managed Retreat			
	Minor Infrastructure	Managed Retreat			
	Actions				
	Undeveloped Areas	AV, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve			
	Developed Areas	AC1, AC2, PR1 - Implement planning controls and emergency plans to accommodate coastal risk and dune care and sand management		MR2 - Remove assets as their risk becomes intolerable	
	Minor Infrastructure	MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe			

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHMAP recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Remove damaged assets and relocate assets at risk	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



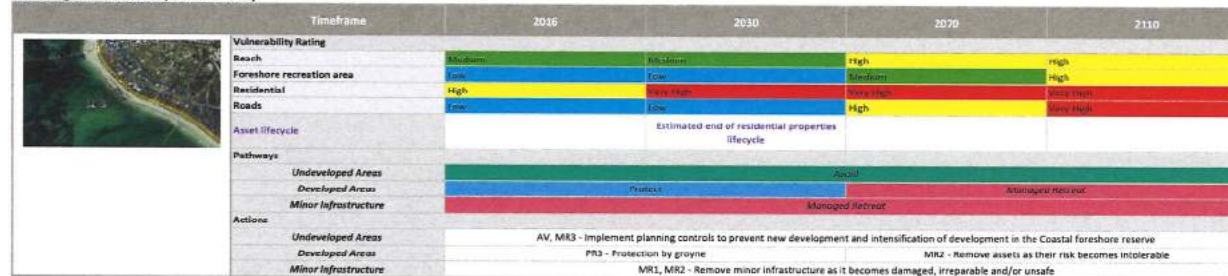
LP1: Ledge Point South of Township

Timeframe	2016	2030	2070	2110
Vulnerability Rating				
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Medium	Medium	High
Beach Carpark (unsealed)	Low	Low	Low	Medium
Road (unsealed)	Low	Low	Low	Low
Asset lifecycle				
Pathways				
Undeveloped Areas	Dune			
Developed Areas	NA			
Minor infrastructure	Managed Retreat			
Actions				
Undeveloped Areas	AV, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve			
Developed Areas	AC1, MR3 - Implement planning controls and emergency plans to accommodate coastal risk			
Minor infrastructure	PR1 - Dune care and sand management			MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Commence dune care program and sand management	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



LP2: Ledge Point Township South of Jetty



Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus S1 reaches 2020 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Extend groyne if feasible, commence dune care program	Remove damaged assets and relocate assets at risk	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



LP3: Ledge Point Township North

LPS: Ledge Point Township North

Timeframe		2015	2030	2070	2110
	Vulnerability Rating				
	Beach	Low	Low	Medium	High
	Coastal/dune vegetation	Low	Medium	Medium	Very High
	Carpark (De Burgh St)	Low	Low	Medium	High
	Road (De Burgh St)	Low	Low	Medium	High
	Holiday Village	Low	Low	High	Very High
	Residential	Low	Low	Very High	Very High
	Key Biscayne Park	Low	Low	Medium	Very High
Asset lifecycle					End of asset lifecycle
Pathways					
Undeveloped Areas		Accommodate			
Developed Areas		Managed Retreat			
Minor Infrastructure		Managed Retreat			
Actions					
Undeveloped Areas		AV, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve			
Developed Areas		AC1, MR3 - Implement planning controls and emergency plans to accommodate coastal risk		MR2 - Remove assets as their risk becomes intolerable	
Minor Infrastructure		MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe			

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Remove damaged assets and relocate assets at risk	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



LP4: Ledge Point North of Township

Timeframe		2015	2030	2070	2110
	Vulnerability Rating				
	Beach	Low	Low	Low	Low
	Coastal/dune vegetation	Low	Medium	Medium	Medium
	Carpark (unsealed)	Low	Low	Low	Low
	Road (unsealed)	Low	Low	Low	Low
Asset lifecycle					
Pathways	Undeveloped Areas	Retreat			
	Developed Areas	NA			
	Minor Infrastructure	Managed Retreat			
Actions					
Undeveloped Areas		AV, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve			
Developed Areas		AC1, MR3 - Implement planning controls and emergency plans to accommodate coastal risk			
Minor Infrastructure		PR1 - Dune care and sand management			
		MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe			

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Commence dune care program and sand management	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



LA1: Lancelin South of Township

Timeframe	2015	2030	2070	2110
Vulnerability Rating				
Beach	Low	Low	Low	Low
Coastal/dune vegetation	Low	Low	Medium	Medium
Carpark (back beach)	Low	Low	Low	Low
Caravan Park (Lancelin South End)	Medium	Medium	High	Very High
Sea Rescue	High	High	Very High	Very High
Grace Darling Park	High	High	Very High	Very High
Asset lifecycle	End of Grace Darling Park lifecycle			
Pathways				
Undeveloped Areas	Retreat			
Developed Areas	Accommodate			
Minor Infrastructure	Managed Retreat			
Actions				
Undeveloped Areas	AV, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve			
Developed Areas	AC1, MR3 - Implement planning controls and emergency plans to accommodate coastal risk		MR2 - Remove assets as their risk becomes intolerable	
Minor Infrastructure	PR2 - Implement beach nourishment to accommodate risk		MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe	

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus 51 reaches 2030 vulnerability line	HSD plus 51 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Implement beach nourishment, commence dune care program and sand management	Remove damaged assets and relocate assets at risk	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



LA2: Lancelin Township South of Jetty

Timeframe		2016	2030	2070	2110
	Vulnerability Rating				
	Beach	Low	Medium	High	Very High
	Coastal/dune vegetation	Low	Medium	High	Very High
	Residential	Low	Low	High	Very High
	Road (Cunliffe St)	Low	Low	Subsistent	High
	Jetty	Low	Medium	High	High
	Light Industrial	Low	Low	Subsistent	High
	Cafe	Low	Low	Subsistent	High
Asset life cycle					End of asset lifecycle
Pathways					
Undeveloped Areas		Accommodate			
Developed Areas		Managed Retreat			
Minor Infrastructure		Managed Retreat			
Actions					
Undeveloped Areas		AM, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve			
Developed Areas		AC1, MR3 - Implement planning controls and emergency plans to accommodate coastal risk			
Minor Infrastructure		MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe			

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Commence dune care program and sand management	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin




LA3: Lancelin Township Jetty to Lancelin Point

Timeframe	2016	2030	2070	2110
Vulnerability Rating				
Beach	Low	Medium	High	Very High
Coastal/dune vegetation	Low	Medium	High	Very High
Road (Gingin Rd)	Low	Medium	Medium	Medium
Caravan Park (Lancelin North End)	Low	Medium	High	High
Hotel & Restaurant	Low	Medium	High	High
Park (Gingin Rd)	Low	Medium	High	High
Primary School	Low	Low	Medium	Medium
Tavern (Endeavour)	Low	Medium	High	High
Residential	Low	High	Very High	Very High
Asset lifecycle	Estimated end of lifecycle			
Pathways	<div> <div>Undeveloped Areas</div> <div>Developed Areas</div> <div>Minor infrastructure</div> </div>			
Actions	<div> <div>Undeveloped Areas</div> <div>Developed Areas</div> <div>Minor infrastructure</div> </div>			

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAP recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Commence dune care program and sand management	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin



LAM: Lancelin Township North of Lancelin Point

	Timeframe	2016		2030		2070		2110	
	Vulnerability Rating								
	Beach	Low	Medium	Very High	Very High				
	Coastal/dune vegetation	Low	Medium	Very High	Very High				
	Residential	Low	High	Very High	Very High				
	Beach Carpark (unsealed)	Low	Low	Medium	Medium				
	Beach Access (Lancelin Island Point)	Low	Medium	Medium	Medium				
	Asset lifecycle					Estimated end of lifecycle			
	Pathways								
	Undeveloped Areas			Avoid					
Developed Areas			Accommodate		Managed Retreat		Adapted Retreat		
Minor Infrastructure					Managed Retreat				
Actions									
Undeveloped Areas					AV, MR3 - Implement planning controls to prevent new development and intensification of development in the Coastal foreshore reserve				
Developed Areas			AC1, MR3 - Implement planning controls and emergency plans to accommodate coastal risk				MR2 - Remove assets as their risk becomes intolerable		
Minor Infrastructure					MR1, MR2 - Remove minor infrastructure as it becomes damaged, irreparable and/or unsafe				

Management Pathway Triggers	Trigger 1	Trigger 2	Trigger 3	Trigger 4
Trigger	CHRMAR recommendation	HSD plus S1 reaches 2030 vulnerability line	HSD plus S1 reaches 2070 vulnerability line	Minor infrastructure becomes damaged or unsafe
Action	Implement planning controls and prepare emergency plans, apply notification on title	Commence dune care program and sand management	Commence dune care program and sand management	Remove assets
Responsibility	Shire of Gingin and State Government	Shire of Gingin	Shire of Gingin	Shire of Gingin

11.3.2 APPLICATION FOR DEVELOPMENT APPROVAL - PROPOSED OVERSIZE OUTBUILDING ON LOT 277 (2) O'NEIL STREET, LANCELIN

FILE: BLD/6787
APPLICANT: NILS STOKKE AND KAREN STOKKE
LOCATION: LOT 277 (2) O'NEIL STREET, LANCELIN
OWNER: NILS STOKKE AND KAREN STOKKE
ZONING: RESIDENTIAL R12.5/20
WAPC NO: N/A
AUTHOR: JAMES BAYLISS – STATUTORY PLANNING OFFICER
REPORTING OFFICER: LISA EDWARDS – EXECUTIVE MANAGER PLANNING
AND DEVELOPMENT
REPORT DATE: 20 FEBRUARY 2018
REFER: NIL

OFFICER INTEREST DECLARATION

Nil

PURPOSE

To consider an Application for Development Approval for a proposed oversize outbuilding on Lot 277 (2) O'Neil Street, Lancelin (subject lot).

BACKGROUND

The Shire received an Application for Development Approval on 12 December 2017 for a proposed outbuilding at the subject lot, which is 993.4m² in area. The site currently contains an existing dwelling and outbuilding, which will be removed subject to a favourable outcome for this application.

The application proposes an outbuilding 14 metres in length and 10.5 metres in width, however due to the design equates to an area of 119m². The outbuilding is proposed with a wall height of 3.3 metres tapering to a ridge height of 4.61 metres. The outbuilding is located at the rear of the existing dwelling, set back one metre from the side (southern) and rear (western) boundaries.

The application seeks variations to Clause 5.4.3 – Outbuildings of the Residential Design Codes of Western Australia (R-Codes) in regards to the side and rear setbacks. The proposal also seeks a variation to Local Planning Policy 2.1 – Residential Outbuildings (LPP 2.1) with respect to the outbuilding's overall area. As such, Council consideration is required.

At the Ordinary Council meeting on 18 July 2017, Council resolved to approve an over height and oversize outbuilding at the property, subject to conditions. The approved outbuilding is 14 metres in length, 6.5 metres in width (91m²) and has a wall height of 4.3 metres tapering to a ridge height of 4.98 metres.

The landowner has reconsidered the design of the previously approved outbuilding and seeks development approval for an alternate design as outlined above. The notable variations include a 1 metre reduction to the proposed wall height, 0.37 metre reduction to the ridge height and a 28m² increase in floor area.

It is noted that, at Council meeting held on 21 November 2017, there was general discussion amongst Councillors with respect to the effectiveness of LPP 2.1. Administration is currently undertaking a review of the Policy and will present any suggested amendments to Council in due course.

A location plan and a copy of the applicant's proposal are attached as **Appendix 1**.

COMMENT

Community Consultation

The application was advertised to surrounding landowners for a period of 21 days in accordance with clause 64 of the *Planning and Development (Local Planning Scheme) Regulations 2015*.

The Shire received no comments during the advertising process.

Local Planning Scheme No. 9 (LPS 9)

The subject land is zoned Residential R12.5/20 under LPS 9, the objectives of which are to:

- a) *Provide for a range of housing types and encourage a high standard of residential development;*
- b) *Maintain and enhance the residential character and amenity of the zone;*
- c) *Limit non-residential activities to those of which the predominant function is to service the local residential neighbourhood and for self-employment or creative activities, provided such activities have no detrimental effect on the residential amenity; and*
- d) *Ensure that the density of development takes cognisance of the availability of reticulated sewerage, the effluent disposal characteristics of the land and other environmental factors.*

Clause 5.2.2 states:

"Unless otherwise provided for in the Scheme, the development of land for any of the residential purposes dealt with by the Residential Design Codes is to conform to the provision of those codes."

State Planning Policy 3.1 - Residential Design Codes of Western Australia

The R-Codes provide a comprehensive basis for the control of residential development throughout Western Australia. When a development does not meet with the deemed-to-comply provisions, the application is assessed against the associated design principles to determine whether the variation is acceptable.

The R-Codes define an 'Outbuilding' as:

'An enclosed non-habitable structure that is detached from any dwelling'.

The proposal provides a 1 metre setback from the side and rear boundaries in lieu of the recommended 1.5 metre setback as stipulated in 'Table 2a - Boundary Setbacks' of the R-Codes.

The deemed-to-comply provisions of the R-Codes relating to Outbuildings stipulates a wall height of 2.4m and that an overall height of 4.2m is not to be exceeded. The wall height proposed is 3.3 metres, with a ridge height of 4.61 metres. Given the proposal does not satisfy the deemed-to-comply provisions, the application is assessed against the associated 'Design Principle' which states:

"Outbuildings that do not detract from the streetscape or the visual amenity of residents or neighbouring properties."

The existing streetscape remains relatively unaffected given the outbuilding is located in the furthest corner of the property from the primary / secondary street frontages. Outbuildings of this nature are prevalent throughout Lancelin.

Notwithstanding the above, LPP 2.1 considered the Design Principle when determining the maximum dimensions for outbuildings within the Shire. It should be noted that the application varies the maximum dimensions prescribed by LPP 2.1, namely the area.

Local Planning Policy 2.1 – Residential Outbuildings

The Shire adopted LPP 2.1 in January 2013 to complement the provisions of the R-Codes relating to outbuildings to better reflect community expectations.

Clause 3.5 – Scale of Outbuilding Development outlines the maximum allowable standards for outbuildings throughout the Shire based on lot size and location. The table below is applicable to the subject lot.

TOWNSITE	STANDARD	MAXIMUM	PROVIDED
Coastal town sites (601m ² – 1000 m ² lot size)	Area Wall Height Overall Height	90m ² 3.6m 5.0m	119m ² - non-compliant 3.3m - complies 4.61m - complies

The proposed development does not comply with the maximum area provided for in LPP 2.1, seeking a 29m² variation as outlined in the table above. There are no relevant objectives under LPP 2.1 to assess the variations against.

LPP 2.1 provides dimensions for the maximum allowable standards that are considered to be acceptable throughout the Shire as stated in Clause 3.5. The dimensions in the above table were created having regard to the Design Principles outlined in the R-Codes and the associated impacts in terms of building bulk / scale. The maximum standards were created to prevent unwanted built form and prescribe standards to prevent excessively large outbuildings being constructed. Therefore any variation that exceeds these requirements is not deemed to satisfy the intent of the Policy.

Applicants Justification

“The shire Councillors previously approved my previous application for a shed higher than normal council guidelines as I need extra room to store my boat, camping gear, car, home workshop and general storage.

Now I have come to the time of applying for a building permit I have had second thoughts and would prefer to build my shed to council’s normal height guidelines but have my shed oversize being 120m² so I can achieve the extra room I require and not have the shed standing out noticeably higher than my neighbour’s sheds.

My block falls just a couple of metres short of 1000m² required for a 120m² shed and would respectfully ask Council to support my application as this way my shed would not stand out at all and would blend in with my neighbours existing sheds who are all in the back corner of their blocks next to each other.

I have spoken to my neighbours about my proposal and they have no objections.”

Conclusion

In summary, the application seeks variation to ‘Local Planning Policy 2.1 – Residential Outbuildings’ and the R-Codes. The variation is not considered to be in accordance with the intent of LPP 2.1 given the maximum allowable standards have been exceeded. The proposed application for an outbuilding at the subject lot is not supported in this instance.

In the event Council does support the application for Development Approval on Lot 277 (2) O’Neil Street, Lancelin then it is recommended that the following conditions be imposed:

1. The land use and development shall be undertaken in accordance with the approved plans unless conditioned indicated otherwise in this Approval;
2. This Approval is for an *Outbuilding* only;
3. The Outbuilding shall not be used for human habitation, commercial or industrial purposes; and
4. Stormwater from all roofed and paved areas shall be collected and contained onsite to the satisfaction of the Shire.

Advice Notes

In the event that Council does support of the Officer’s recommendation, then the following advice note will apply:

Note 1: If you are aggrieved with the conditions of this approval you have the right to request the State Administrative Tribunal (SAT) review the decision, under Part 14 of the *Planning and Development Act 2005*.

STATUTORY ENVIRONMENT

Planning and Development (Local Planning Scheme) Regulations 2015
Schedule 2 – Deemed Provisions for Local Planning Schemes

Local Planning Scheme No. 9
State Planning Policy 3.1 – Residential Design Codes of Western Australia
Local Planning Policy 2.1- Residential Outbuildings

POLICY IMPLICATIONS

Nil

BUDGET IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Shire of Gingin Strategic Community Plan 2017-2027

Focus Area	<i>Infrastructure and Development</i>
Objective	<i>3. To effectively manage growth and provide for community through the delivery of community infrastructure in a financially responsible manner</i>
Outcome	<i>3.1 Development New and existing developments meet the Shire's Strategic Objectives and Outcomes</i>
Key Service Area	<i>Building And Planning Permits</i>
Priorities	<i>N/A</i>

VOTING REQUIREMENTS – SIMPLE MAJORITY

RECOMMENDATION

It is recommended that Council refuse Development Approval for a proposed oversize outbuilding on Lot 277 (2) O'Neil Street, Lancelin under clause 68 (2) of Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* for the following reason:

1. The size of the outbuilding does not meet the deemed-to-comply provisions or demonstrate compliance with the Design Principles of Clause 5.4.2 of State Planning Policy 3.1 – Residential Design Codes.

MOTION

Moved Councillor Court, seconded Councillor Fewster that Council refuse Development Approval for a proposed oversize outbuilding on Lot 277 (2) O'Neil Street, Lancelin under clause 68 (2) of Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* for the following reason:

1. The size of the outbuilding does not meet the deemed-to-comply provisions or demonstrate compliance with the Design Principles of Clause 5.4.2 of State Planning Policy 3.1 – Residential Design Codes.

For: Councillors Collard, Court and Fewster

Against: Councillors Elgin, Johnson, Morton, Peczka and Rule

MOTION LOST
3-5

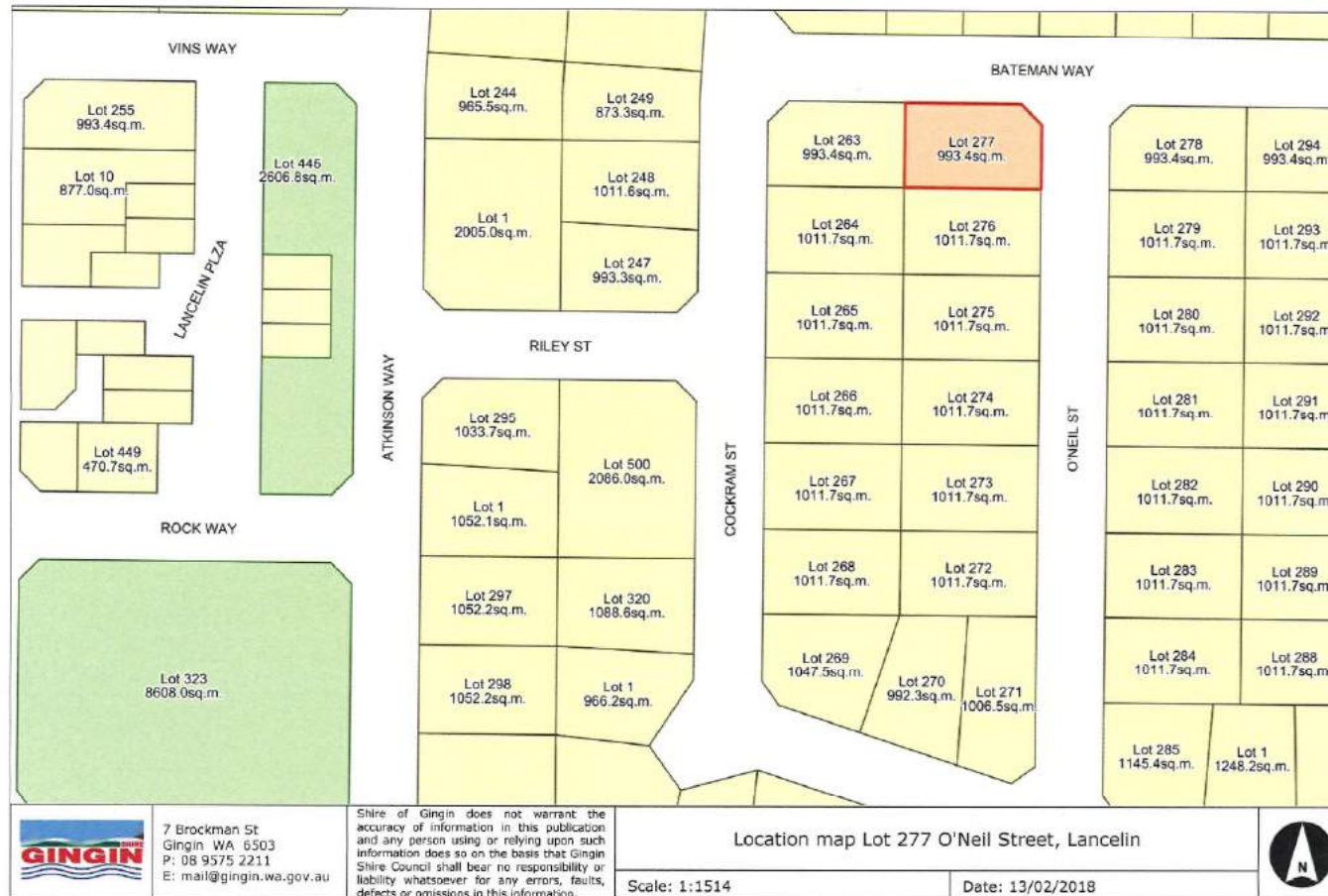
FORESHADOWED MOTION

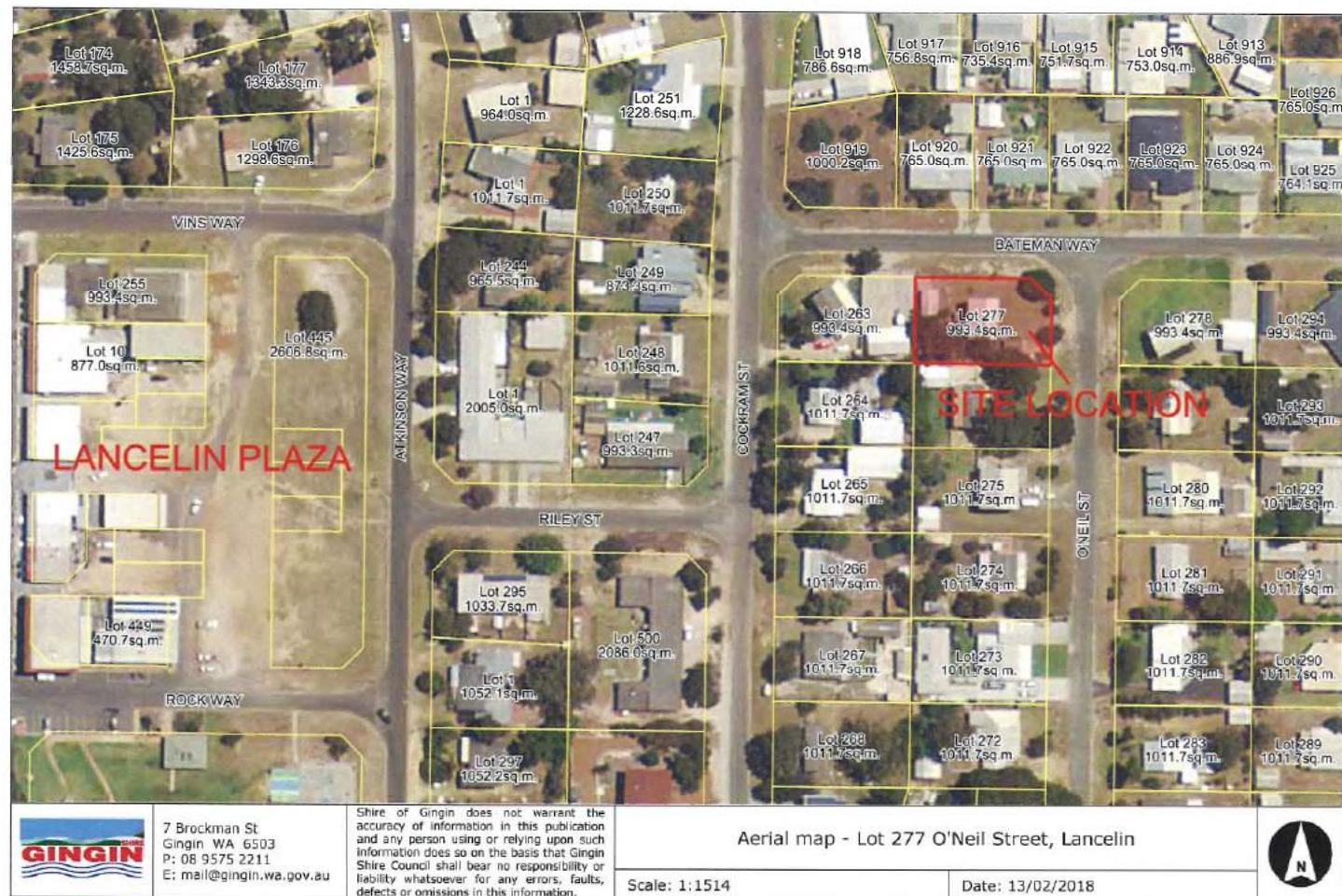
Moved Councillor Elgin, seconded Councillor Johnson that Council approve the development of a proposed oversize outbuilding on Lot 277 (2) O'Neil Street, Lancelin under clause 68 (2) of Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* subject to the following:

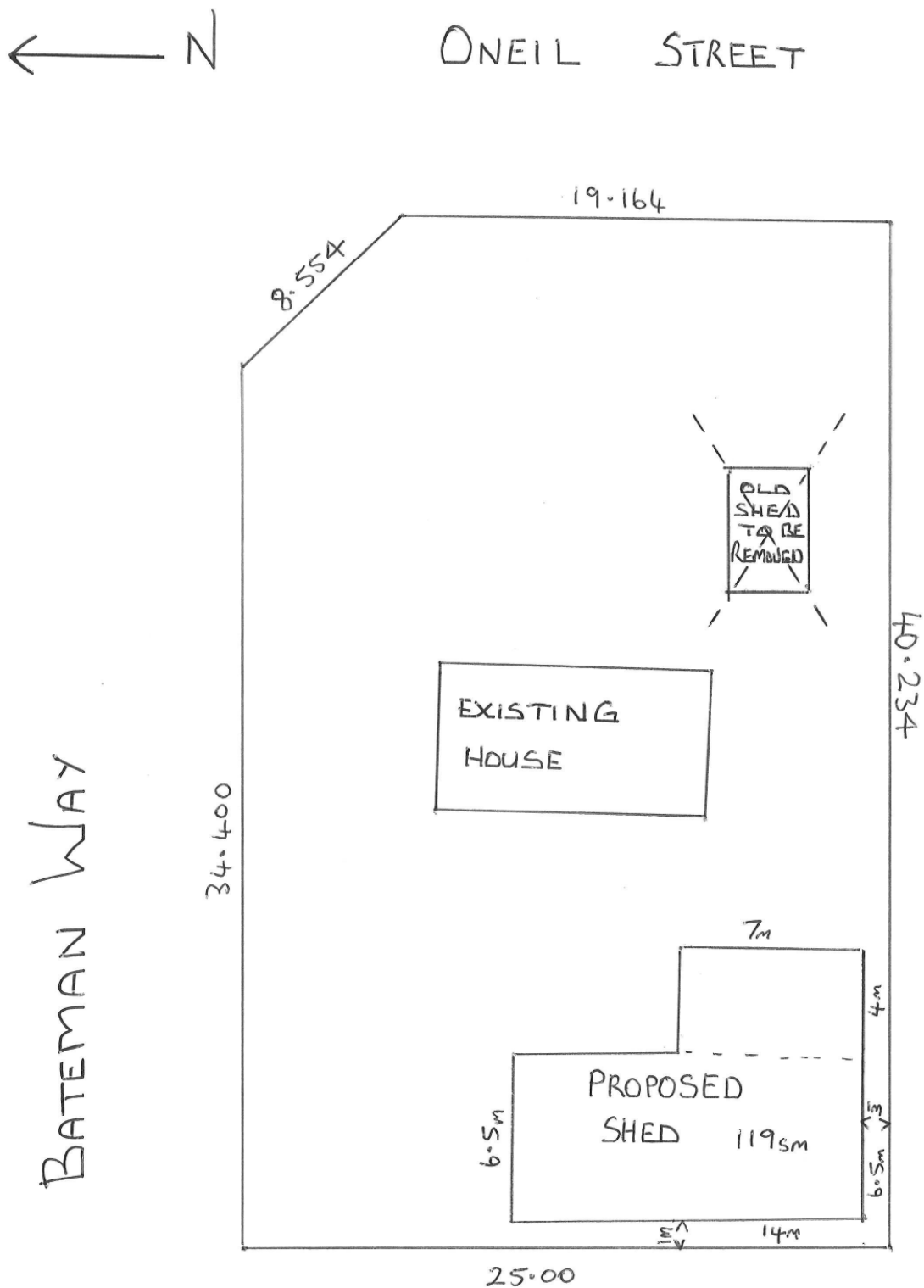
1. The land use and development shall be undertaken in accordance with the approved plans unless conditioned indicated otherwise in this approval;
2. This approval is for an outbuilding only;
3. The outbuilding shall not be used for human habitation, commercial or industrial purposes;
4. Stormwater from all roofed and paved areas shall be collected and contained onsite to the satisfaction of the Shire; and
5. That all other outbuildings on the property be removed within 60 days of completion of the new shed.

CARRIED UNANIMOUSLY

APPENDIX 1







SITE PLAN
1:200

PROPOSED NEW SHED FOR N.K. STOKKE
2 ONEIL STREET LANCELIN

Building For: *Reduced Height 120sqm.*
Nils Stokke
Lancelin
Job Number: 35458
Produced by:
Western Sheds Pty Ltd
Phone: 08 94178880



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11.3.3 APPLICATION FOR DEVELOPMENT APPROVAL - PROPOSED OVER HEIGHT OUTBUILDING ON LOT 17 (5) PYP COURT, LANCELIN

FILE: BLD/6893
APPLICANT: OUTDOOR WORLD LANCELIN
LOCATION: LOT 17 (5) PYP COURT, LANCELIN
OWNER: CHRISTOPHER SMYTH
ZONING: RESIDENTIAL R12.5/20
WAPC NO: N/A
AUTHOR: JAMES BAYLISS – STATUTORY PLANNING OFFICER
REPORTING OFFICER: LISA EDWARDS – EXECUTIVE MANAGER PLANNING
AND DEVELOPMENT
REPORT DATE: 20 FEBRUARY 2018
REFER: NIL

OFFICER INTEREST DECLARATION

Nil

PURPOSE

To consider an Application for Development Approval for a proposed over height outbuilding on Lot 17 (5) Pyp Court, Lancelin (subject lot).

BACKGROUND

The Shire received an Application for Development Approval on 27 November 2017 for a proposed outbuilding on the subject lot, which is 849.6m² in area. The site currently contains an existing dwelling.

The application proposes an outbuilding 11 metres in length and 5.5 metres in width, equating to an area of 60.5m². The skillion design results in a maximum wall height of 4.5 metres tapering to 4.1 metres. The outbuilding is located to the side of the existing carport, setback 0.9m metre from the side (eastern) boundary approximately 9 metres to the front (southern) boundary.

The proposal seeks a variations to Clause 5.4.3 – Outbuildings of the Residential Design Codes of Western Australia (R-Codes) in regards to the side setback. The proposal also seeks a variation to Local Planning Policy 2.1 – Residential Outbuildings (LPP 2.1) with respect to the outbuildings wall height. As such, Council consideration is required.

It is noted that, at Council meeting held on 21 November 2017, there was general discussion amongst Councillors with respect to the effectiveness off LPP 2.1. Administration is currently undertaking a review of the Policy and will present any suggested amendments to Council in due course.

A location plan and a copy of the applicant's proposal are attached as **Appendix 1**.

COMMENT

Community Consultation

The application was advertised to surrounding landowners for a period of 14 days in accordance with clause 64 of the *Planning and Development (Local Planning Scheme) Regulations 2015*.

The Shire received no comments during the advertising process.

Local Planning Scheme No. 9 (LPS 9)

The subject land is zoned Residential R12.5/20 under LPS 9, the objectives of which are to:

- a) *Provide for a range of housing types and encourage a high standard of residential development;*
- b) *Maintain and enhance the residential character and amenity of the zone;*
- c) *Limit non-residential activities to those of which the predominant function is to service the local residential neighbourhood and for self-employment or creative activities, provided such activities have no detrimental effect on the residential amenity; and*
- d) *Ensure that the density of development takes cognisance of the availability of reticulated sewerage, the effluent disposal characteristics of the land and other environmental factors.*

Clause 5.2.2 states:

“Unless otherwise provided for in the Scheme, the development of land for any of the residential purposes dealt with by the Residential Design Codes is to conform to the provision of those codes.”

State Planning Policy 3.1 - Residential Design Codes of Western Australia

The R-Codes provide a comprehensive basis for the control of residential development throughout Western Australia. When a development does not meet with the deemed-to-comply provisions, the application is assessed against the associated design principles to determine whether the variation is acceptable.

The R-Codes define an ‘Outbuilding’ as:

‘An enclosed non-habitable structure that is detached from any dwelling’.

The proposal provides a 0.9 metre setback from the side boundary in lieu of the recommended 1.5 metre setback as stipulated in ‘Table 2a - Boundary Setbacks’ of the R-Codes.

The deemed-to-comply provisions of the R-Codes relating to Outbuildings stipulates a wall height of 2.4m and that an overall height of 4.2m is not to be exceeded. The wall height proposed is 4.58m tapering to 4.1 metres. Given the proposal does not satisfy the deemed-to-comply provisions the application is assessed against the associated 'Design Principle' which states:

“Outbuildings that do not detract from the streetscape or the visual amenity of residents or neighbouring properties.”

The existing streetscape remains relatively unaffected given the outbuilding is setback 9 metres from the front boundary. This notwithstanding, the location of the outbuilding within the property results in a reduced side setback. The orientation of the outbuilding results in the 4.5 metre wall height being closest to the side boundary. The reduced setback in conjunction with the large wall height is considered to have an unnecessary impact on the visual amenity of the adjoining property to the east.

It should be noted that the site has no identified constraints which requires the outbuilding to be in its proposed location. The site is considered to have more appropriate areas available to situate the outbuilding that will comply with the relevant setback provisions and have less impact on adjoining land to the east.

Furthermore, LPP 2.1 considered the Design Principles when determining the maximum dimensions for outbuildings within the Shire. It should be noted that the application varies the maximum dimensions prescribed by LPP 2.1, namely the wall height.

Local Planning Policy 2.1 – Residential Outbuildings

The Shire adopted LPP 2.1 in January 2013 to complement the provisions of the R-Codes relating to outbuildings to better reflect community expectations.

Clause 3.5 – Scale of Outbuilding Development outlines the maximum allowable standards for outbuildings throughout the Shire based on lot size and location. The table below is applicable to the subject lot.

TOWNSITE	STANDARD	MAXIMUM	PROVIDED
Coastal town sites (601m ² – 1000 m ² lot size)	Area Wall Height Overall Height	90m ² 3.6m 5.0m	60.5m ² - complies 4.58m - non-compliant 4.5m - complies

The proposed development does not comply with the maximum wall height provided for in LPP 2.1, seeking a 0.98 metre variation as outlined in the table above. There are no relevant objectives under LPP 2.1 to assess the variations against.

LPP 2.1 provides dimensions for the maximum allowable standards that are considered to be acceptable throughout the Shire as stated in Clause 3.5. The dimensions in the above table were created having regard to the Design Principles outlined in the R-Codes and the associated impacts in terms of building bulk / scale. The maximum standards were created to prevent unwanted built form and prescribe standards to prevent excessively large outbuildings being constructed. Therefore any variation that exceeds these requirements is not deemed to satisfy the intent of the Policy.

Applicants Justification

"We are seeking approval for an oversize shed and reduced side boundary setback to allow for storage of a large boat. For insurance purposes the boat must be stored under cover. The reduced setback on the South East boundary allows for the shed to be built and accessed to the rear of the property reducing visibility from the front."

Conclusion

In summary, the application seeks a variation to LPP 2.1 and the R-Codes. The variations are not considered to be in accordance with the intent of LPP 2.1 given the maximum allowable standards have been exceeded. The proposed application for an outbuilding at the subject lot is not supported in this instance.

In the event Council does support the application for Development Approval on Lot 17 (5) Pyp Court, Lancelin then it is recommended that the following conditions be imposed:

1. The land use and development shall be undertaken in accordance with the approved plans unless conditioned indicated otherwise in this Approval;
2. This Approval is for an *Outbuilding* only;
3. The Outbuilding shall not be used for human habitation, commercial or industrial purposes; and
4. Stormwater from all roofed and paved areas shall be collected and contained onsite to the satisfaction of the Shire.

Advice Notes

In the event that Council is supportive of the Officer's recommendation, then the following advice note will apply:

Note 1: If you are aggrieved with the conditions of this approval you have the right to request the State Administrative Tribunal (SAT) review the decision, under Part 14 of the *Planning and Development Act 2005*.

STATUTORY ENVIRONMENT

Planning and Development (Local Planning Scheme) Regulations 2015
Schedule 2 – Deemed Provisions for Local Planning Schemes

Local Planning Scheme No. 9
State Planning Policy 3.1 – Residential Design Codes of Western Australia
Local Planning Policy 2.1- Residential Outbuildings

POLICY IMPLICATIONS

Nil

BUDGET IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Shire of Gingin Strategic Community Plan 2017-2027

Focus Area	<i>Infrastructure and Development</i>
Objective	<i>3. To effectively manage growth and provide for community through the delivery of community infrastructure in a financially responsible manner</i>
Outcome	<i>3.1 Development New and existing developments meet the Shire's Strategic Objectives and Outcomes</i>
Key Service Area	<i>Building And Planning Permits</i>
Priorities	<i>N/A</i>

VOTING REQUIREMENTS – SIMPLE MAJORITY

RECOMMENDATION

It is recommended that Council refuse Development Approval for a proposed over height outbuilding on Lot 17 (5) Pyp Court, Lancelin under clause 68 (2) of Schedule 2 of the Planning and Development (Local Planning Schemes) Regulations 2015 for the following reason:

1. The height of the outbuilding does not meet the deemed-to-comply provisions or demonstrate compliance with the Design Principles of Clause 5.4.2 of State Planning Policy 3.1 – Residential Design Codes.

MOTION

Moved Councillor Court, seconded Councillor Rule that Council refuse Development Approval for a proposed over height outbuilding on Lot 17 (5) Pyp Court, Lancelin under clause 68 (2) of Schedule 2 of the Planning and Development (Local Planning Schemes) Regulations 2015 for the following reason:

1. The height of the outbuilding does not meet the deemed-to-comply provisions or demonstrate compliance with the Design Principles of Clause 5.4.2 of State Planning Policy 3.1 – Residential Design Codes.

For: Councillors Court and Rule

Against: Councillors Collard, Elgin, Fewster, Johnson, Morton and Peczka

MOTION LOST

2-6

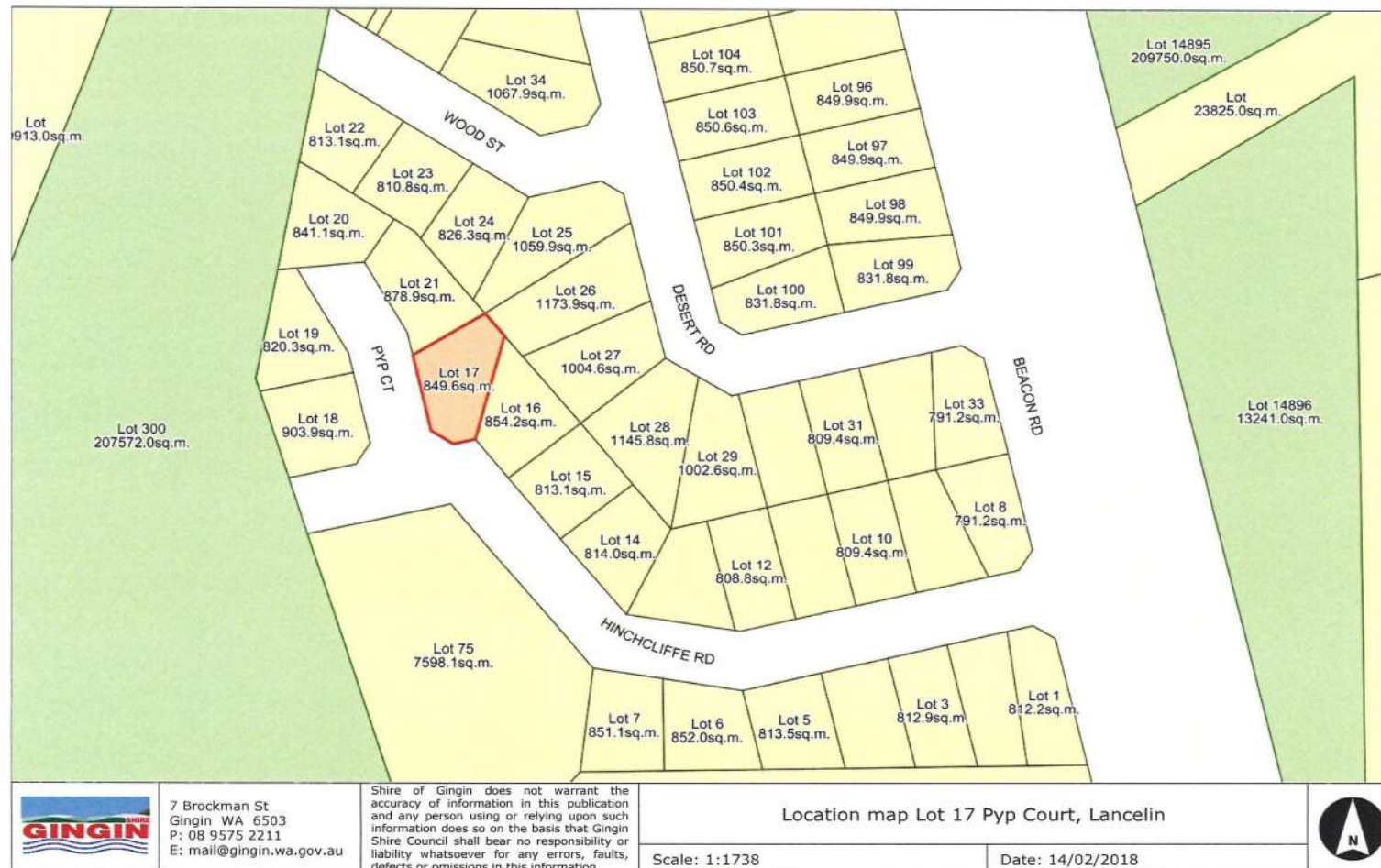
ALTERNATIVE MOTION

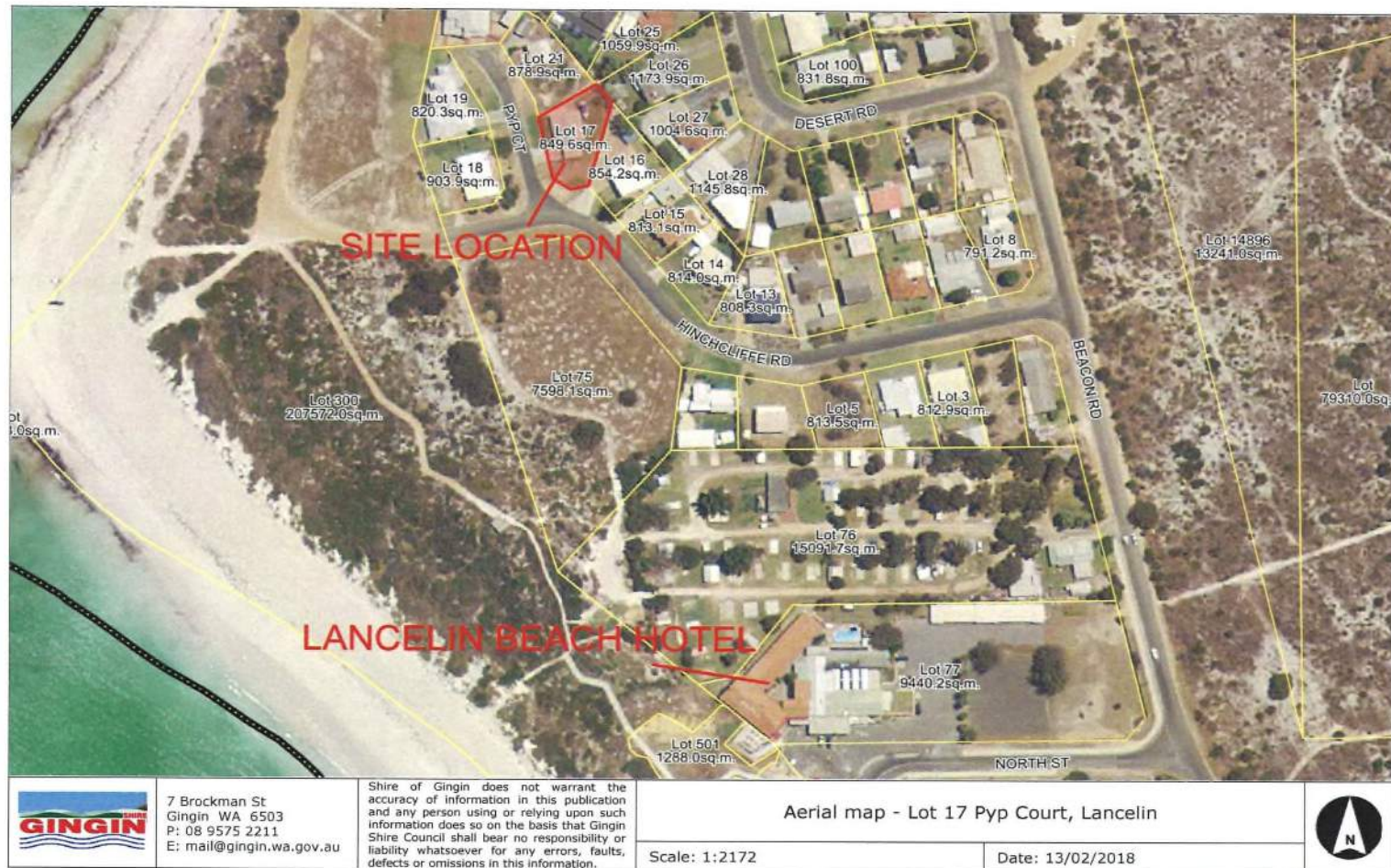
Moved Councillor Fewster, seconded Councillor Peczka that Council approve the development of an over height outbuilding on Lot 17 (5) Pyp Court, Lancelin under clause 68 (2) of Schedule 2 of the Planning and Development (Local Planning Schemes) Regulations 2015 subject to the following:

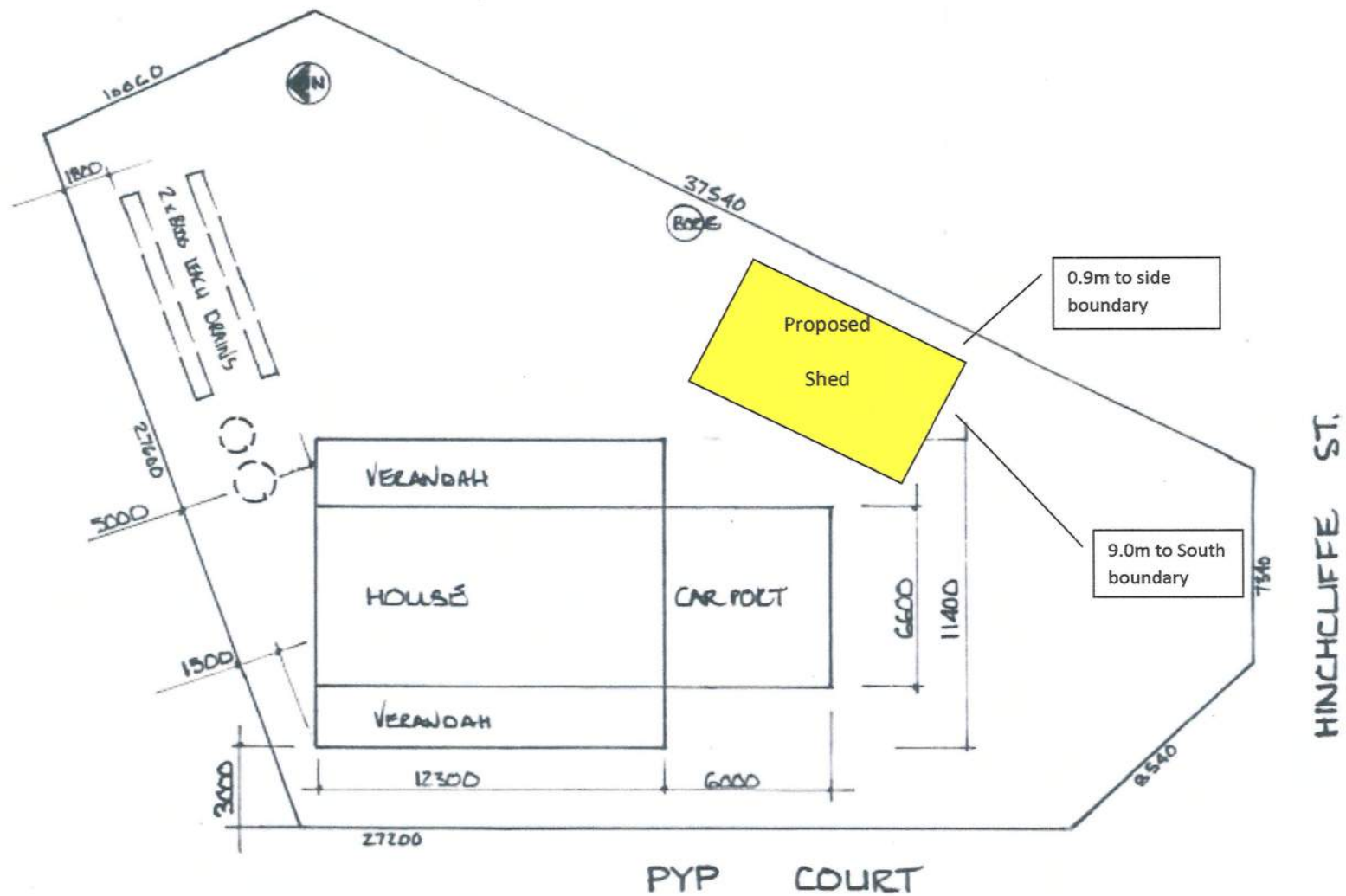
- 1. The land use and development shall be undertaken in accordance with the approved plans unless conditioned indicated otherwise in this approval;**
- 2. This approval is for an outbuilding only;**
- 3. The outbuilding shall not be used for human habitation, commercial or industrial purposes; and**
- 4. Stormwater from all roofed and paved areas shall be collected and contained onsite to the satisfaction of the Shire.**

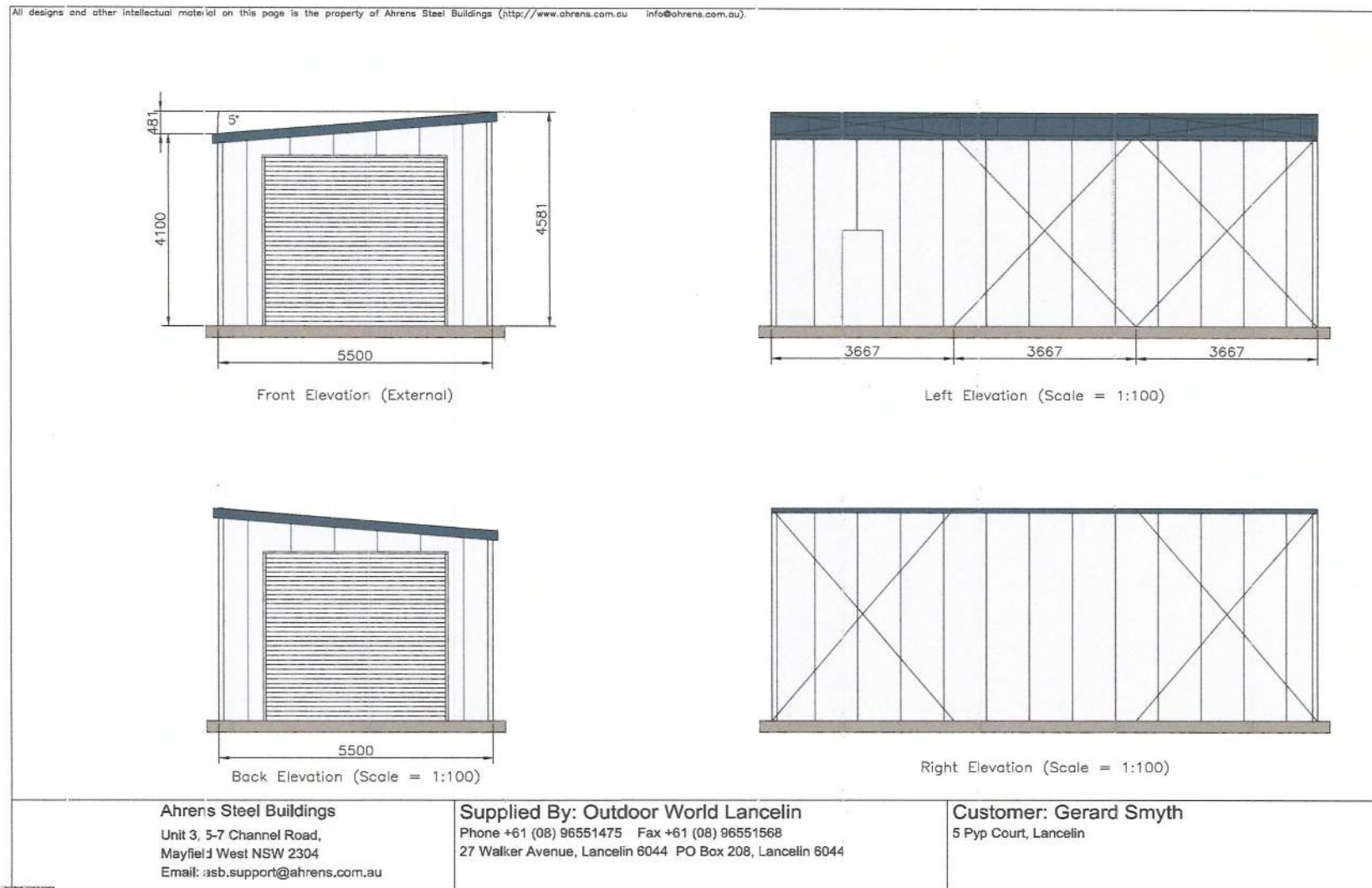
CARRIED UNANIMOUSLY

APPENDIX 1









11.3.4 APPLICATION FOR DEVELOPMENT APPROVAL - PROPOSED TELECOMMUNICATIONS INFRASTRUCTURE (MOBILE BASE STATION) ON LOT 9916 EDWARDS STREET, SEABIRD

FILE:	BLD/6889
APPLICANT:	VISION STREAM
LOCATION:	LOT 9916 (RESERVE 36684) EDWARDS STREET, SEABIRD
OWNER:	WATER CORPORATION
ZONING:	PUBLIC USE
WAPC NO:	N/A
AUTHOR	JAMES BAYLISS – STATUTORY PLANNING OFFICER
REPORTING OFFICER:	LISA EDWARDS – EXECUTIVE MANAGER PLANNING AND DEVELOPMENT
REPORT DATE:	20 FEBRUARY 2018
REFER:	NIL

OFFICER INTEREST DECLARATION

Nil

PURPOSE

To consider an Application for Development Approval for proposed Telecommunications Infrastructure (Mobile Base Station) on Lot 9916, Reserve No. 36684 Edwards Street, Seabird (subject lot).

BACKGROUND

The Shire received an Application for Development Approval on 8 November 2017 for a proposed telecommunications facility on the subject lot, which is 14,400m² in area. The site is under a management order to the Water Corporation for the purpose of a bore pumping station.

The subject lot has frontage to Edwards Street and is bound by General Rural zoned land on the remaining lot boundaries. Land further to the west is predominantly zoned residential.

Telstra seeks to expand mobile coverage in regional Australia through the Federal Government's Mobile Blackspot Program. The subject lot is identified as an appropriate location for the following works:

- Installation of one 40 metre monopole;
- Installation of a straight mount headframe;
- Installation of four (4) OMNI antennas;
- Installation of an equipment shelter (3m in height with an area of 7.5m²) at the base of the monopole; and
- Installation of a 10m x 10m stock-proof fence to secure the site.

A location plan and a copy of the applicant's full proposal are provided as **Appendix 1**.

COMMENT

Community Consultation

The application was advertised in accordance with clause 64 of the *Planning and Development (Local Planning Scheme) Regulations 2015*. Landowners within a 500 metre radius were afforded 21 days to provide comment, with State referral agencies being provided 42 days for a response.

The Shire received 20 submissions from ratepayers (16 in favour, 3 against and 1 general comment). The Seabird Progress Association supports the proposal. Five submissions have been received from State referral agencies which generally are in support of the proposal, with the exception of the Department of Water and Environment (DWER) which requested that an alternate location be considered. DWER did, however, provide recommended conditions in the event that Council supports the application.

The Schedule of Submissions and Recommended Responses is attached as **Appendix 2**. Visionstream have also provided a response to the Submissions received that is attached as **Appendix 3**.

PLANNING FRAMEWORK

Local Planning Scheme No. 9 (LPS 9)

The subject lot is zoned 'Public Use: Service and Infrastructure' under LPS 9, however is reserved for the purpose of a bore pumping station, under management order to the Water Corporation. In accordance with Clause 2.5.2 of LPS 9, "Use and Development of Local Reserves", the following is to be considered:

"Clause 2.5.2

In determining an application for planning approval the local government is to have due regard to –

- a) The matters set out in clause 10.2; and*
- b) The ultimate purpose intended for the Reserve.*

Clause 2.5.3

In case of land reserved for the purposes of a public authority, the local government is to consult with that authority before determining an application for planning approval."

'Telecommunications Infrastructure' is defined under LPS 9 as:

"land used to accommodate any part of the infrastructure of a telecommunications network and includes any lines, equipment, apparatus, tower, antenna, tunnel, duct, hole, pit or other structure used, or for use in or in connection with, a telecommunications network."

The subject lot is located within Special Control Area No. 2 – Public Drinking Water Source under LPS 9 which requires the following to be considered:

“Clause 5.3.3 - Development Standards and Considerations

5.3.3.1 In determining land uses and development proposals within Special Control Areas, the local government will have due regard to relevant State Government policies, including Statement of Planning Policy No. 2.7 and the most recent Department of Environment, Water Catchment and Protection (DEWCP) Land Use Compatibility Tables for PDWSA’s.

5.3.3.2 Notwithstanding, the permissibility of land uses in the Zoning Table, the following uses are not permitted within the PDWSA Special Control Areas:

- *Abattoir;*
- *Piggery;*
- *Power Station;*
- *Fish Processing;*
- *Tannery; and*
- *Woolscouring.*

5.3.3.3 In determining proposals, the local government is to have due regard to any comments or recommendations from DEWCP, and may impose relevant conditions to prevent or minimise the potential risk of groundwater contamination. Local government should also have regard to the management direction provided by the priority classification of certain areas, noting that:

- *Priority 2 (P2) areas are defined to ensure there is no increased risk of pollution to the water source; and*
- *Priority 3 (P3) areas are defined to manage the risk of pollution to the water source.”*

The terminology referenced in the scheme, as outlined above, has changed with respect to the appropriate agency now being DWER and not DEWCP. The policies the Shire shall have due regard for are provided below. It should be noted the proposed land use (Telecommunication Infrastructure) does not fall within those outlined as being not permitted. Furthermore, the subject site is considered a Priority 1 (P1) water source area.

Statement of Planning Policy No. 2.7 - Public Drinking Water Source Policy

The objective of Statement of Planning Policy No. 2.7 - Public Drinking Water Source Policy (SPP 2.7) is to ensure that land use and development within a public drinking water source area is compatible with the protection and long term management of the water resources for public water supply. SPP 2.7 describes Priority 1 (P1) water source area as follows:

“Priority 1 (P1) source protection areas are defined and managed to ensure there is no degradation of the water resource in these areas. This is the highest level of protection for the water source and normally will apply to land owned by the State, and that is characterized by low-intensity and low-risk land use, such as forestry. Protection of the public water supply outweighs virtually all other considerations in respect to the use of this land. P1 source protection areas are managed in accordance with the principle of risk avoidance.”

The land use is not deemed to pose a risk to the protection and long term management of the water resource and is considered to accord to SPP 2.7.

Water Quality Protection Note No. 25 - Land Use Compatibility Tables for Public Drinking Water Source Areas

The Water Quality Protection Note No. 25 is similar to SPP 2.7 in that it sets out guidelines on appropriate land uses and activities within public drinking water sources areas. ‘Table 2 – Compatibility of Land Uses and Activities for the Protection of Water Quality within Public Drinking Water Source Areas’ indicates the land use ‘Telecommunication Infrastructure’ as being a compatible use within P1 water sources areas subject to conditions.

Once established the proposed mobile base station will have no effect on the water source area as there is no ongoing ground disturbance. The construction phase of the proposal is deemed to be able to be satisfactorily manage any ground disturbance to prevent any risk to the public water source.

The Shire is guided by the comments received from DWER with respect to the need for a Water Management Plan prior to any ground disturbance occurring. Appropriate conditions are recommended as per DWER advice and in accordance with Water Quality Protection Note No. 25.

Telecommunications Act 1997

The *Telecommunications Act 1997* requires that the installation of telecommunications facilities, apart from specified facilities and activities, must comply with State planning and environmental legislation. This means that unless exempted by legislation or a planning scheme, telecommunications facilities in Western Australia require development approval prior to installation.

Exemptions under the *Telecommunications Act 1997* include:

1. A low impact facility described in the *Telecommunications (Low Impact Facilities) Determination 1997* (the Determination) and all existing and future amendments to the Determination, when installed by a carrier;
2. Inspection and maintenance;
3. A temporary defence facility; and
4. A facility authorised by a Facilities Installation Permit issued under the *Telecommunications Act 1997*.

Given no exemptions are applicable in this instance, development approval is required.

State Planning Policy 5.2 – Telecommunications Infrastructure

State Planning Policy 5.2 – *Telecommunications Infrastructure* has the following provisions for Council to consider when assessing an Application for Telecommunications Infrastructure.

6.3 *Development*

In considering a development application, the local government should give consideration to:

- a) *The extent to which the proposal adheres to the policy measures outlined in Section 5 of this Policy;*
- b) *The need for services to be located to optimise coverage; and*
- c) *Documentation to be submitted under Section 6.3.1 of this Policy.*

The advertising period for a development proposal should be no more than 21 days.

Before determining an application for telecommunications infrastructure the Western Australian Planning Commission (WAPC) and/or Local Government should consider and have regard to the following:

- 1. *Assessment of the visual impact of development proposals for telecommunications infrastructure should be made on a case by case basis;*
- 2. *Telecommunications infrastructure should be sited and designed to minimise visual impact and whenever possible:*
 - a. *Be located where it will not be prominently visible from significant viewing locations such as scenic routes, lookouts and recreation sites;*
 - b. *Be located to avoid detracting from a significant view of a heritage item or place, a landmark, a streetscape, vista or panorama, whether viewed from public or private land;*
 - c. *Not be located on sites where environmental, cultural heritage, social and visual landscape values maybe compromised; and*
 - d. *Display design features, including scale, materials, external colours and finishes that are sympathetic to the surrounding landscape;*
- 3. *In addition to the existing exemptions under the Telecommunications Act, Local Governments should consider exempting telecommunications infrastructure from the requirement for development approval where:*

- a. *The infrastructures has a maximum height of 30 metres from finished ground level;*
 - b. *The proposal complies with the policy measures outlined in this policy; and*
 - c. *The proponent has undertaken notification of the proposal in a similar manner to 'low impact facilities' as defined and set out in the Mobile Phone Base Station Deployment Industry Code (C564:2011);*
4. *Telecommunications infrastructure should be located where it will facilitate continuous network coverage and/or improved telecommunications services to the community; and*
5. *Telecommunications infrastructure should be co-located and whenever possible:*
 - a. *Cable and lines should be located within an existing underground conduit or duct; and*
 - b. *Overhead lines and towers should be co-located with existing infrastructure and/or within existing infrastructure corridors and/or mounted on existing or proposed buildings.*

Visual Impact

Given the topography of the land and the height of the monopole, it is inevitable that the telecommunications infrastructure will be visible from the surrounding locality. The proposed location is not considered to detract from views of significance, which are predominantly ocean views to the west of the existing residential areas.

The monopole is proposed to remain unpainted (grey colour) which has been demonstrated over time, at a variety of sites, to most successfully blend with the natural environment. Vegetative screening is recommended to be planted at the base of the monopole, surrounding the stock proof fence to alleviate any adverse impacts the base frame and shelter may impose.

Environmental Impact

Administration does not anticipate any environmental impacts as a result of the proposal. The location has existing Water Corporation infrastructure onsite and minimal clearing will be required for the mobile base station.

Health Impact

Telstra, along with other mobile providers, must adhere to Commonwealth legislation and regulations regarding mobile phone facilities which is administered by the Australian Communications and Media Authority (ACMA). In 2003, the ACMA adopted a technical standard for exposure to electromagnetic energy (EME) with a significant safety margin, or precautionary approach.

The EME report prepared for the subject lot, submitted as part of the applicant's proposal, determined that any exposure to EME from the mobile base station is 0.007% of the technical standard referenced above.

Furthermore, the World Health Organisation concluded that all expert reviews on the health effects and exposure to radiofrequency fields have concluded that no adverse health effects have been established from exposure to radiofrequency at levels below the international safety guidelines that have been adopted in Australia.

The Department of Communications Fact Sheet *Communications Towers, Radio Transmitters and Safety – Information for Communities and their Parliamentary Representatives* is provided as **Appendix 4**.

Summary

In summary, the proposal is recommended for approval on the basis that Lot 9916 (Reserve No. 36684) Edwards Street, Seabird is considered to be a suitable location for the proposed telecommunications infrastructure. The subject site is deemed to be the optimal location to achieve the required coverage while mitigating any potential impacts on the Seabird community. The proposal is deemed to satisfy LPS 9 and the relevant applicable planning framework.

Advice Notes

In the event Council approves this Development Application, the following Advice Notes will apply:

- A. If you are aggrieved with the conditions of this approval you have the right to request the State Administrative Tribunal (SAT) review the decision, under Part 14 of the *Planning and Development Act 2005*.
- B. If the development subject to this approval is not substantially commenced within a period of 2 years, the approval shall lapse and have no further effect.
- C. Further to this approval, the applicant is required to submit working drawings and specifications to comply with the requirements of the *Building Act 2011* and *Health Act 2016*, which are to be approved by the Shire of Gingin;
- D. The proposed tower will need to comply with any Air Services Australia / Department of Defence regulations in relation to tall structure requirements.
- E. The Department of Defence requests that you provide Air Services Australia (ASA) "as constructed" details. The details can be emailed to ASA at the following email address: vod@airservicesaustralia.com.
- F. If the proponent chooses to provide obstacle lighting to indicate the presence of the mast at night, to ensure consistency and avoid any confusion to pilots, the obstacle lighting installation should conform with the CASA Manual of Standards (MOS) Part 139, Chapter 9. The MOS is available from CASA's website, <http://casa.gov.au/wcmswr/assets/main/rules/1998casr/139/139mfull.pdf>.

STATUTORY ENVIRONMENT

Local Planning Scheme No. 9

Part 3 – Zones and the Use of Land

3.2 Objectives of the Zones

Part 4 – General Development Requirements

4.7 General Development Standards

4.8.6 – General Rural Zones

Statement of Planning Policy No. 2.7 - Public Drinking Water Source Policy

Water Quality Protection Note No. 25 - Land Use Compatibility Tables for Public Drinking Water Source Areas

State Planning Policy 5.2 – Telecommunications Infrastructure

Sections 5 and 6

Telecommunications Act 1997

Telecommunications (Low Impact Facilities) Determination 1997 (Commonwealth)

POLICY IMPLICATIONS

Nil

BUDGET IMPLICATIONS

Nil

STRATEGIC IMPLICATIONS

Shire of Gingin Strategic Community Plan 2017-2027

Focus Area	<i>Infrastructure and Development</i>
Objective	<i>3. To effectively manage growth and provide for community through the delivery of community infrastructure in a financially responsible manner</i>
Outcome	<i>3.1 Develop new and existing developments to meet the Shires Strategic Objectives and Outcomes</i>
Key Service Area	<i>Building and Planning Permits</i>

VOTING REQUIREMENTS – SIMPLE MAJORITY

RECOMMENDATION

It is recommended that Council grant Development Approval for the proposed Telecommunications Infrastructure (Mobile Base Station) on Lot 9916, (Reserve No. 36684) Edwards Street, Seabird subject to the following conditions:

1. The land use and development shall be undertaken in accordance with the approved plans unless conditioned indicated otherwise in this Approval;
2. This Approval is for a Telecommunication Infrastructure (Mobile Base Station) only;
3. Prior to site works commencing the Applicant is to submit a Water Management Plan to the satisfaction of the Shire of Gingin and the Department of Water and Environmental Regulation
4. Prior to site works commencing the Applicant is to submit a landscaping plan to the satisfaction of the Shire of Gingin, indicating vegetative screening at the base of the monopole.
5. As constructed details must be provided to Air Services Australia in accordance with the requirements of the Department of Defence; and
6. The Applicant shall ensure that the amenity of the area is not adversely affected by noise and dust emissions during the construction stage.

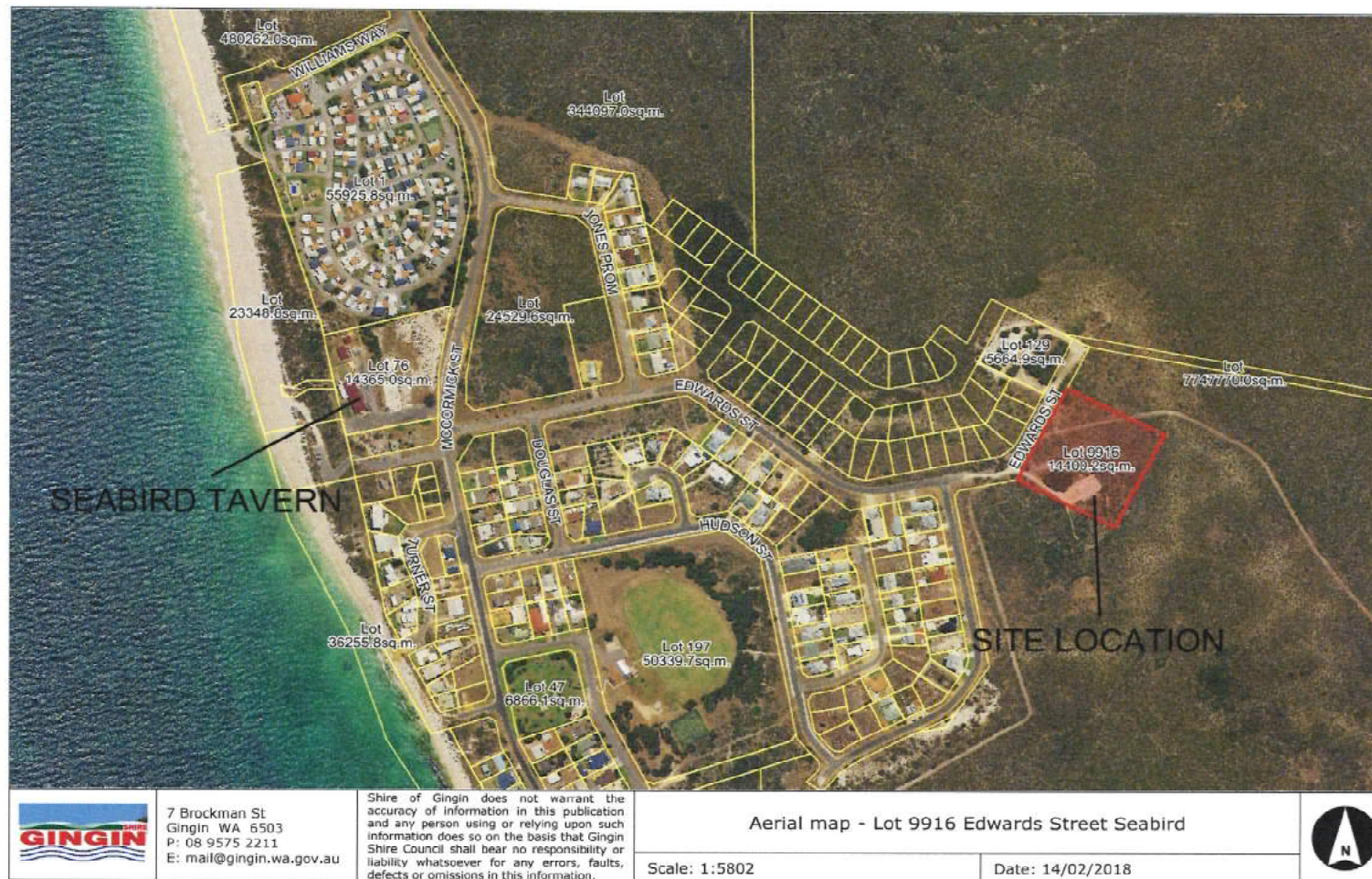
RESOLUTION

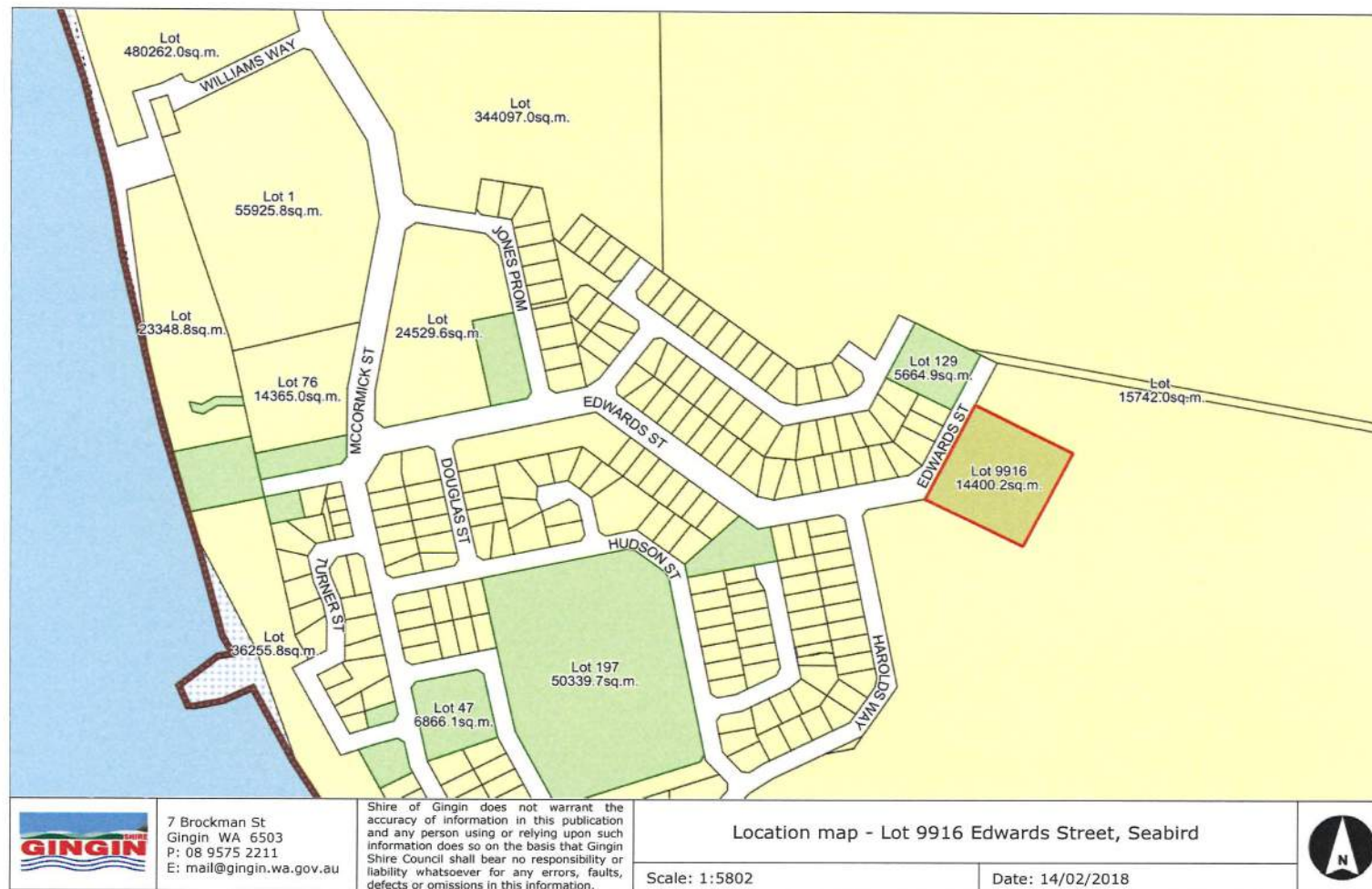
Moved Councillor Elgin, seconded Councillor Rule that Council grant Development Approval for the proposed Telecommunications Infrastructure (Mobile Base Station) on Lot 9916, (Reserve No. 36684) Edwards Street, Seabird subject to the following conditions:

1. The land use and development shall be undertaken in accordance with the approved plans unless conditioned indicated otherwise in this Approval;
2. This Approval is for a Telecommunication Infrastructure (Mobile Base Station) only;
3. Prior to site works commencing the Applicant is to submit a Water Management Plan to the satisfaction of the Shire of Gingin and the Department of Water and Environmental Regulation
4. Prior to site works commencing the Applicant is to submit a landscaping plan to the satisfaction of the Shire of Gingin, indicating vegetative screening at the base of the monopole.
5. As constructed details must be provided to Air Services Australia in accordance with the requirements of the Department of Defence; and
6. The Applicant shall ensure that the amenity of the area is not adversely affected by noise and dust emissions during the construction stage.

CARRIED UNANIMOUSLY

APPENDIX 1





PLANNING ASSESSMENT REPORT

Development Application for

The installation of a Telecommunications Facility at

Lot 9916 on DP183928, Edwards Street, Seabird WA 6042

Reserve 36684

Document prepared by **Visionstream Pty Ltd**

On behalf of **Telstra Corporation Ltd**

Project Name: Seabird

Project No.: WA08801.01

October 2017





Contents

Document Control	2
1.0 Executive Summary	3
1.1 Site and Proposal Details	3
1.2 Applicant Details	3
2.0 Introduction	3
3.0 Proposed Scope of Works	4
4.0 Purpose of the Proposal	4
5.0 Mobile Telecommunications Networks	5
6.0 Site Parameters	5
7.0 Candidate Sites	6
7.1 Nominated Candidate	9
7.2 The Site	10
8.0 Federal Regulatory Framework	11
8.1.0 Telecommunications Act 1997	11
8.1.1 Telecommunications (Low-impact Facilities) Determination 1997	11
9.0 State Regulatory Framework	11
9.1 Planning and Development Act 2005	11
9.2 Statement of Planning Policy No. 5.2 – Telecommunications Infrastructures (WAPC)	11
10.0 Local Regulatory Framework	16
10.1 Shire of Gingin Local Planning Scheme No. 9	16
11.0 General Provisions	16
11.1 Visual Impacts	17
11.2 Heritage	18
11.3 Flora and Fauna	18
11.4 Traffic	18
11.5 Access	18
11.6 Utilities	19
11.7 Construction	19
11.8 Bushfire	19
12.0 Conclusion	21
Appendix A – Certificate of Title	22
Appendix B – Plans of the Proposal	23
Appendix C – Environmental EME Report	24
Appendix D – Fact Sheets	25
Appendix E – Site Photographs	26
Appendix F – Environment Analysis Report (EPBC)	28
Appendix G – Photomontage	29



Document Control

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1.0	03/10/2017	Draft Report	Adam Wood	Daniel Hay
2.0	27/10/2017	Final Report	Adam Wood	Daniel Hay
3.0	27/10/2017	Authorisation to submit by Client	Adam Wood	Jonathan Moar

DISCLAIMER

Visionstream Australia Pty Ltd does not accept any risk or responsibility for a third party using this document, unless written authorisation is provided by Visionstream Australia Pty Ltd.



1.0 Executive Summary

1.1 Site and Proposal Details

Address of Site	Lot 9916 on DP183928, Edwards Street, Seabird WA 6042
Legal Property Description	Lot 9916 on Deposited Plan 183928 Vol. LR3143 Folio 501 – Reserve 36684
Local Authority	Shire of Gingin
Planning Instrument	Shire of Gingin Local Planning Scheme No. 9
Zone and Overlay	Public Use Service and Infrastructure Special Control Area – SCA- Public Drinking Water Source – SCA2
Use	Telecommunications Facility
Owner	Water Corporation

1.2 Applicant Details

Applicant	Telstra Corporation Limited ABN 051 775 558 C/- Visionstream Pty Ltd	
Contact Person	Adam Wood	(08) 6555 8518 Adam.Wood@Visionstream.com.au
Our Reference	WA08801.01 Seabird	
RFNSA Site Id	6042001	

2.0 Introduction

This report has been prepared by Visionstream on behalf of Telstra as supporting information to a Planning Permit Application for the installation of a 40.0 metre high telecommunications facility at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird WA 6042.

Refer to Appendix 1 for Title details

All mobile phone network operators are bound by the operational provisions of the federal *Telecommunications Act 1997* ("The Act") and the *Telecommunications Code of Practice 1997*. The *Telecommunications (Low-Impact Facilities) Determination 1997* allows for the upgrade of existing mobile phone network infrastructure without the consent of a relevant statutory authority.

In this instance the proposed development does not comply as a "Low Impact facility" under the definitions contained in the Commonwealth legislation. Therefore it is subject to the provisions of the *WA Planning and Development Act 2005* and the provisions of the Shire of Gingin Local Planning Scheme No. 9.

For further information on the Mobile Black Spot Program, including coverage and site specific information, please head to <https://www.telstra.com.au/coverage-networks/mobile-black-spot-program>.



3.0 Proposed Scope of Works

The proposal is inclusive of the following scope of works:

- Install one (1) 40m monopole;
- Installation of a straight-mount headframe;
- Install four (4) new OMNI antennas;
- Installation of one (1) Telstra Equipment Shelter, that is not more than 3m high with a base area of not more than 7.5m² at the base of the aforementioned monopole;
- Installation of associated ancillary cabling and equipment;
- Install a new stock-proof fence (dimensions 10m x 10m) surrounding the Telstra compound, with a 3m wide access gate; As part of the installation the 10m x 10m compound area will be cleared of all existing vegetation, with an additional 3m firebreak surrounding the compound.

Refer to Plans attached in Appendix B for further details.

4.0 Purpose of the Proposal

The purpose of the application is to receive development approval for the installation of a telecommunications facility at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird, on behalf of Telstra in accordance with the Federal Government Mobile Black Spot Program.

By way of a background:

Mobile Black Spot Program

Telstra is participating in one of the largest ever expansions of mobile coverage in regional and remote Australia, through the Federal Government's Mobile Black Spot Program.

Telstra will be building 429 new 3G/4G base stations over the next three years, plus a further 250 4G data small cells, representing a combined investment of more than \$340 million by Telstra, the Federal Government and several State and Local Governments as well.

Mobile connectivity has grown in importance as the combination of smart phones and tablets with increased mobile broadband speeds and capacity are changing the way we live and the availability of these services is often taken for granted in metropolitan locations.

Over 400 communities who currently have no coverage in or around their towns will benefit from a new 3G/4G service. This has been made possible by the support of not just the Federal Government, but very significant contributions by State and Local Governments as well.

With this Government partnership, Telstra is committing \$165 million of its own funds in return for the \$94.8 million allocated to Telstra by the Federal Government and has worked with Victorian, NSW, Queensland, Tasmanian and Western Australian State Governments as well as multiple Local Governments to attract tens of millions of dollars in targeted additional funding. This means Telstra is able to deliver an investment of over \$340 million in regional telecommunications. Coupled with unparalleled experience in building networks, this investment will bring new and improved coverage to hundreds of communities across the country.

As the first carrier to bring 4G mobile services to regional Australia, Telstra knows how important high-speed mobile can be to supporting local businesses, tourism and education and will continue the expansion of its 4G and 4GX services.

Telstra is proud to have put forward a strong bid for regional Australia as part of a competitive tender process, and looks forward to rolling out the new base stations and expanding coverage for hundreds of communities over the next three years.



5.0 Mobile Telecommunications Networks

A mobile telecommunications network is made up of multiple base stations covering a geographic area. They work by sending and receiving radio signals from their antennas to mobile phones and other mobile devices such as tablets, wireless dongles etc. Base stations are designed to provide service to the area immediately surrounding the base station – can be up to several kilometres. Depending on the technical objectives of a base station, the physical characteristics of each telecommunications facility; such as its height, number and size of antennas, equipment, cabling etc. will vary.

As a general rule, the higher the antennas at a base station, the greater its range of coverage and its ability to relieve capacity issues. If this height is compromised, additional facilities, and thus more infrastructure will be required for any given locality. The further a facility is located away from its technically optimum position, the greater the compromise of service. This may result in coverage gaps and require additional or taller base stations to provide adequate service.

Each base station transmits and receives signals to and from mobile devices in the area. As the mobile device user moves around, their device will communicate with the nearest base station/ facility to them at all times. If they cannot pick up a signal, or the nearest base station is congested (already handling the maximum number of phone calls or maximum level of data usage) the user may not be able to place a call, experience a call "drop out" or a slowing data rate while attempting to download content.

The current proposal will form part of Telstra's NextG network solution to Seabird and surrounding areas and will deliver essential mobile services (voice calling, SMS), as well as live video calling, video-based content including; news, finance and sports highlights, and high-speed wireless internet – wireless broadband. With a coverage footprint of more than 2.1 million square kilometres and covering more than 99% of the Australian population. Telstra's NextG is Australia's largest and fastest national mobile broadband network and as such requires more network facilities, located closer together to ensure a high quality signal strength to achieve reliable service and the fastest possible data transfer rates.

6.0 Site Parameters

Telstra commences the site selection process with a search of potential sites that meet the network's technical requirements, with a view to also having the least possible impact on the surrounding area. Telstra applies and evaluates a range of criteria as part of this site selection process.

Telstra assesses the technical viability of potential sites through the use of computer modelling tools that produce predictions of the coverage that may be expected from these sites, as well as from the experience and knowledge of the radio engineers.

There are also a number of other important criteria that Telstra uses to assess options and select sites that may be suitable for a proposed new facility. These take into account factors other than the technical performance of the site, and include:

- The potential to co-locate on an existing telecommunications facility.
- The potential to locate on an existing building or structure.
- Visual impact and the potential to obtain relevant town planning approvals.
- Proximity to community sensitive locations and areas of environmental heritage.
- The potential to obtain tenure at the site.
- The cost of developing the site and the provision of utilities (power, access to the facility and transmission links).

Telstra is also contracted to meet objectives of the Mobile Black Spot Program, with parameters set by the Federal Government. A number of factors determined which areas received funding, including the lack of outdoor coverage and the number of people who would benefit from a new facility.

In the Mobile Black Spot Program Discussion, Australian Government Department of Communications 2013, it states that:

"The Mobile Black Spot Program will improve mobile phone coverage and competition in regional and remote Australia, including along major transport routes, in small communities and in locations prone to



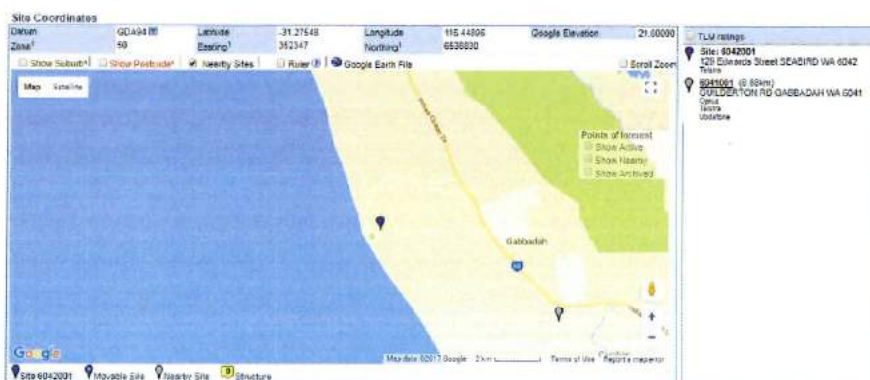
In making the proposal for this site at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird, Telstra has carefully weighed all of the above criteria. This analysis is detailed in the next section.

Telstra carefully examined a range of possible deployment options in the area before concluding that a new telecommunications facility at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird would be the most appropriate solution to provide necessary mobile phone coverage to the Seabird area as part of the Federal Government's Mobile Black Spot Program.

- Colocation opportunities and existing telecommunications infrastructure within proximity to the proposed installation; and
- An analysis of the locations considered when determining an appropriate location for a new telecommunications installation within the required coverage area.

The Communications Alliance Ltd. (formerly Australian Communications Industry Forum Ltd. - ACIF) *Industry Code C564:2011 – Mobile Phone Base Station Deployment* promotes the use of existing sites in order to mitigate the effects of facilities on the landscape. It should also be noted that as a first preference, Telstra attempts to utilise, where possible, any existing infrastructure or co-location opportunities.

Accordingly, there is an identified lack of telecommunications facilities within the vicinity of the proposed installation, with the nearest existing facility being more than 8km South-West of the proposed facility in Seabird. As such, there were no suitable colocation opportunities to provide the required radio frequency coverage objectives.



Page 6 of 29



Candidates considered

Investigations into the installation of a new telecommunications facility within the Seabird area have been ongoing and more recently in conjunction with the Federal Government's Mobile Black Spot Program to improve mobile coverage to this region.

The site which has been selected is deemed to be the most optimal location to achieve the required coverage requirements.

Candidate	Location	Proposal	Zoning	Description
Candidate A	Edwards & McCormick Street, Seabird, WA 6042 (Road Reserve) Lat: -31.275299° Long: 115.442273°	Greenfield 25m Monopole	Road Reserve	Site located in proximity to residential housing in low density area amongst a small coastal town. Any site proposal will hugely impact on the visual amenity of the area and Council has advised upfront they will not support this location.
Candidate B	Lot 129 Edwards Street, Seabird, WA 6042 Lat: -31.274573° Long: 115.448360°	Greenfield 25m Monopole	Public Use Service and Infrastructure	This candidate is zoned for Public Use: Service and Infrastructure and currently hosts a large water tower and ancillary equipment. Through further investigation at this location it was determined that there was no feasible spot within the compound that would not impact the existing services. With the height and proximity to the existing water tower also posing some design constraints.
Candidate C	Lot 197 Hudson Street, Seabird, WA 6042 Lat: -31.276692° Long: 115.444347°	Greenfield 40m Monopole	Parks and Recreations	Site is located Parks and Recreation and a 40m monopole was assessed at this location. Whilst being fairly central to the town, a site at this location would cause a large amount of visual impact to the community. Council have advised they will not support a proposal in this location
Candidate D	44 McCormick Street, Seabird, WA 6042 Lat: -31.274308° Long: 115.440881°	Greenfield 40m Monopole	Tourism	Property is located within the zoning for "tourism" which does not permit telecommunications
Candidate E	21 Edwards Street, Seabird, WA 6042 Lat: -31.274556° Long: 115.443711°	Greenfield 40m Monopole	Public Use Service and Infrastructure	Site is an existing Fire & Rescue Facility. A site here would have substantial visual impacts to the community. Council have advised they will not support a proposal in this location



Candidate F	Lot 8544 Seabird Road, Seabird, WA 6042 Lat: -31.253382° Long: 115.456317°	Greenfield 40m Monopole	Public Use Basic Raw Materials	Whilst this was Council's preferred location (landfill site) it was a considerable distance from the township which was discounted for coverage and power/fibre run issues.
Candidate G	Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird WA 6042 Lat: -31.275480° Long: 115.448960°	Greenfield 40m Monopole	Public Use Service and Infrastructure	This candidate has been selected as the primary candidate and will be discussed at further length throughout this report.



Figure 2: Location of Proposed Candidates



Figure 3: Location of Proposed Candidates (Seabird Township)

7.1 Nominated Candidate

A preferred nominated candidate was selected for the proposed facility, based on the radiofrequency objectives, planning and environmental issues, potential community sensitive uses and engineering criteria, as noted above. In this case, **Candidate G** (a new 40m Monopole located at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird WA 6042) was considered the best option. This was based on the following:

- The site is appropriately located and sited so as to minimise visual and environmental impact on the immediate and surrounding area;
- Sufficiently setback from sensitive uses;
- The site will achieve the required coverage objectives for the area;
- The site will meet design and construction considerations; and
- The proposal operates within the regulatory framework of Commonwealth, State and Local Government.

As stated above, the site selection process carefully considered environmental and visual constraints, existing and future land use characteristics, the orderly planning of the area and the design of the facility. On balance, it is considered that the location and height of the facility ensures optimal service provision to the area whilst minimizing any perceived visual impacts.

The proposed Telstra site has been located and designed to minimise any adverse impact on the amenity of the surrounding area. The site has been located approximately 150m from the nearest road (Edwards Street), and approximately 140m from the nearest neighbouring residential dwelling (2 Harolds Way, Seabird). Due to the topography of the overall township, the site has been located to effectively provide coverage to the area whilst effectively responding to the landscape setting in the area. Additionally, the site has been located nearby to the only other tall structure within the town, identified as the existing water tower located at Candidate B. In this regard, by grouping with an existing tall structure, this will mean the site will not detract from the area.



7.2 The Site

The subject site is located at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird WA 6042. The legal description of the property is Lot 9916 on Deposited Plan, Reserve 36684 Volume LR3143 Folio 501. A copy of the Certificate of Title has been attached for information purposes (**Appendix 1 – Certificate of Title**).

The land is classified as a Reserve under Management Order with the primary interest holder being Water Corporation.

The aforementioned land is zoned 'Public Use Service and Infrastructure / Special Control Area – SCA – Public Drinking Water Source – SCA2' under the provisions of the Shire of Gingin Local Planning Scheme No. 9 – refer to **Section 10.1** for additional information on planning schemes and map images.

The site is currently used for the purpose of Water Corporation and the provision of their infrastructure services. The site will be accessed from Edwards Street via the existing gated property driveway. The surrounding land is classified as General Rural, with the land to the West of the site being predominately residential in use.



Figure 4: Proposed Telstra Site – Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird
(Source: Google Earth)

Appropriate setbacks to any identified 'sensitive sites' has been considered and achieved during the detailed siting of the facility. The closest residential property is approximately 140m West of the site location.

The site is not located in an area of environmental significance as defined by The *Telecommunications (Low-Impact Facilities) Determination 1997*.



8.0 Federal Regulatory Framework

The following information provides a summary of the Federal legislation relevant to telecommunications development proposals.

8.1.0 Telecommunications Act 1997

The *Telecommunications Act 1997* (the Act) came into operation on 1st July 1997. The Act provides a system for regulating telecommunications and the activities of carriers and service providers.

Under the Act, telecommunications carriers are no longer exempt from State and Territory planning laws except in three limited instances:

1. There are exemptions for inspection of land, maintenance of facilities, installation of "low impact facilities", subscriber connections and temporary Defence facilities. These exemptions are detailed in the *Telecommunications (Low-impact Facilities) Determination 1997* and the *Amendment No. 1 of 2012* and these exceptions are subject to the *Telecommunications Code of Practice 1997*;
2. A limited case-by-case appeals process exists to cover installation of facilities in situations of national significance; and
3. There are some specific powers and immunities from the previous *Telecommunications Act 1991*.

8.1.1 Telecommunications (Low-impact Facilities) Determination 1997

The Telecommunications (Low-impact Facilities) Determination came into effect on 1st July 1997 and the Amendment to the Determination (No.1 of 2012) came into effect on 23rd November 2013.

The Determination contains a list of Telecommunications Facilities that the Commonwealth will continue to regulate. These are facilities that are essential to maintaining telecommunications networks and are unlikely to cause significant community disruption during their installation or operation. These facilities are therefore considered to be 'Low-impact' and do not require planning approval under State or territory laws.

The proposed facility at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird WA 6042 does not fall under the Determination and, therefore, requires approval under State planning legislation.

9.0 State Regulatory Framework

The following information provides a summary of the State legislation/ guidelines relevant to telecommunications development proposals.

9.1 Planning and Development Act 2005

The Minister of Planning and Infrastructure has ultimate authority for town planning in Western Australia. Development within Western Australia is controlled by the *Planning and Development Act 2005* through the application of environmental planning instruments. Under the Planning and Development Act 2005, the Western Australian Planning Commission (WAPC) is the responsible authority for land use planning and development matters and this report seeks to demonstrate compliance with the WAPC and other items of relevant legislation which pertain to the subject application.

9.2 Statement of Planning Policy No. 5.2 – Telecommunications Infrastructures (WAPC)

The WAPC *Statement of Planning Policy No. 5.2 – Telecommunications Infrastructure* (SPP 5.2) provides a framework for the preparation, assessment and determination of applications for planning approval of telecommunications facilities within the context of the planning system of Western Australia.



Planning Policy 5.2 states that 'telecommunications infrastructure should be located, sited and designed in accordance with the following Guiding Principles'.

Principles	Comments	Complies
There should be a co-ordinated approach to the planning and development of telecommunications infrastructure, although changes in the location and demand for services require a flexible approach.	Telstra undertakes a carefully co-ordinated and planned approach to the development of their network.	✓
Telecommunications infrastructure should be strategically planned and co-ordinated, similar to planning for other essential infrastructure such as networks and energy supply.	The proposed facility is strategically planned and co-ordinated to ensure that the facility will provide high level coverage to Seabird and surrounds.	✓
Telecommunications facilities should be located and designed to meet the communication needs of the community.	The proposed facility seeks to provide mobile coverage to Seabird and surrounding area.	✓
Telecommunications facilities should be designed and sited to minimise any potential adverse visual impact on the character and amenity of the local environment, in particular, impacts on prominent landscape features, general views in the locality and individual significant views.	The proposed 40m monopole has been sited to maintain the primary use of the land whilst considering the visual impact to the surrounding area. The site carefully considered environmental and visual constraints, existing and future land use characteristics, the orderly planning of the area and the design of the facility. On balance, it is considered that the location and height of the facility ensures optimal service provision to the area whilst minimizing any perceived visual impact.	✓
Telecommunications facilities should be designed and sited to minimise impacts on areas of natural conservation value and places of heritage significance or where declared rare flora are located.	A desktop study of the proposed site indicated that it is not affected by any Heritage listings. Whilst some minor clearing of the existing small-medium scrub will be undertaken, it is expected that there will be no impact on the natural environment or its surrounds. The extent of the clearing required will be for the compound and appropriate firebreaks, and minor access track as required.	✓
Telecommunications facilities should be designed and sited with specific consideration of water catchment protection requirements and the need to minimise land degradation.	Prior to the commencement of work Telstra will undertake such measures as deemed necessary by Council to effectively protect water catchments within the immediate area.	✓



Telecommunications facilities should be designed and sited to minimise adverse impacts on the visual character and amenity of residential area.	Telstra has selected a site and location that seeks to minimise any perceived negative impacts on the visual amenity of the area, particularly when viewed from residential areas. The monopole will remain unpainted (dull grey in colour) which blends in with the sky. Furthermore, the proposed subject site maintains suitable separation distance to surrounding residential areas. The proposed site location has been identified in conjunction with the landowner.	✓
Telecommunications cables should be placed underground, unless it is impractical to do so and there would be no significant effect on visual amenity or, in the case of regional areas, it can be demonstrated that there are long-term benefits to the community that outweigh the visual impact.	Overhead cabling is not proposed for this site.	✓
Telecommunications cables that are installed overhead with other infrastructure such as electricity cables should be removed and placed underground when it can be demonstrated and agreed by the carrier that it is technically feasible and practical to do so.	This principle does not apply to the subject of this application.	✓
Unless it is impractical to do so telecommunications towers should be located within commercial, business, industrial and rural areas and areas outside identified conservation areas.	The proposed site is zoned 'General Farming' as identified by the Shire of Dardanup Local Planning Scheme No. 3. As such, with the principle designated use being 'Rural', the proposed facility will be located in the desired zoning.	✓
The design and siting of telecommunications towers and ancillary facilities should be integrated with existing buildings and structures, unless it is impractical to do so, in which case they should be sited and designed so as to minimise any adverse impact on the amenity of the surrounding area.	As per Section 7 of this report, no opportunities for co-location were identified in the area and as such it has been identified that the proposed Telstra site location is seen as the preferred site location.	✓
Co-location of telecommunications facilities should generally be sought, unless such an arrangement would detract from local amenities or where operation of the facilities would be significantly compromised as a result.	As per Section 7 of this report, no opportunities for co-location were identified in the area and as such it has been identified that the proposed Telstra site location is seen as the preferred site location.	✓



Measures such as surface mounting, concealment, colour co-ordination, camouflage and landscaping to screen at least the base of towers and ancillary structures, and to draw attention away from the tower, should be used, where appropriate, to minimise the visual impact of telecommunications facilities.	Telstra has selected a site and location that seeks to minimise any perceived negative impacts on the visual amenity of the area, particularly when viewed from residential areas. The monopole will remain unpainted (dull grey in colour) which blends in with the sky. Furthermore, the proposed subject site maintains suitable separation distance to surrounding residential areas. The proposed site location has been identified in conjunction with the landowner. The site will also be surrounded by existing vegetation, further mitigating any perceived visual impacts.	✓
Design and operation of a telecommunications facility should accord with the licensing requirements of the Australian Communications Authority, with physical isolation and control of public access to emission hazard zones and use of minimum power levels consistent with quality services.	Telecommunications facilities include radio transmitters that radiate electromagnetic energy (EME) into the surrounding area. The levels of these electromagnetic fields must comply with safety limits imposed by the Australian Communications and Media Authority (ACMA, previously ACA). All Telstra installations are designed to operate within these limits.	✓
Construction of a telecommunications facility (including access to a facility) should be undertaken so as to minimise adverse effects on the natural environment and the amenity of users or occupiers of adjacent property, and ensure compliance with relevant health and safety standards.	During construction, Telstra contractors will endeavour to minimise the impact of their works on the amenity of nearby residents and on the surrounding environment. As the proposed site is located in an open space and away from any nearby residential properties, adverse effects on neighbouring properties will be minimal. Following construction, maintenance (excluding emergency repair work) activities should not interfere with the amenity of users. All Health and Safety standards will be adhered to.	✓

Under section 5.1.1 of the State Planning Policy 5.2: Telecommunications Infrastructure Policy the West Australian Planning Commission provides a set of measures in assessing the visual impact of a proposed telecommunications facility.

An assessment of these guidelines below has found that the proposed Telstra Mobile Phone Base Station is compliant with the intent and requirements of the State Planning Policy 5.2: Telecommunication Infrastructure Policy.

Measures	Comments	Complies
Be located where it will not be prominently visible from significant viewing locations such as scenic routes, lookouts and recreation sites;	The proposed 40m monopole has been sited to maintain the primary use of the land whilst considering the visual impact to the surrounding area. The site carefully considered environmental and visual constraints, existing and future land use characteristics, the orderly planning of the area and the design of the facility. Through siting the facility near existing taller structures (Water Tank) and also on land currently used for infrastructure to the east of the township, we have considered the future growth of the region and also the predominant view shed to the west (towards the coast). On balance, it is considered that the location and height of the	✓



	facility ensures optimal service provision to the area whilst minimizing any perceived visual impact.	
Be located to avoid detracting from a significant view of a heritage item or place, a landmark, a streetscape, vista or a panorama, whether viewed from public or private land;	Telstra has selected a site and location that seeks to minimise any perceived negative impacts on the visual amenity of the area, particularly when viewed from residential areas. The monopole will remain unpainted (dull grey in colour) which blends in with the sky. Furthermore, the proposed subject site maintains suitable separation distance to surrounding residential areas. The proposed site location has been identified in conjunction with the landowner. The site will also be surrounded by existing mature vegetation, further mitigating any perceived visual impacts.	✓
Not be located on sites where environmental, cultural heritage, social and visual landscape values may be compromised;	There are no known items of Environmental, Cultural or social significance located on the proposed site. Any visual impact has been mitigated through a variety of design elements.	✓
Display design features, including scale, materials, external colours and finishes that are sympathetic to the surrounding landscape;	The proposed 40m monopole has been sited to maintain the primary use of the land whilst considering the visual impact to the surrounding area. The site carefully considered environmental and visual constraints, existing and future land use characteristics, the orderly planning of the area and the design of the facility. On balance, it is considered that the location and height of the facility ensures optimal service provision to the area whilst minimizing any perceived visual impact. The monopole will remain unpainted (dull grey colour), which has over time been demonstrated to most successfully blend with the uniform colours of the site's setting.	✓
Be located where it will facilitate continuous network coverage and/or improved telecommunications services to the community;	Telstra wish to establish a new mobile telecommunication base station facility in the area to provide the community with a far greater choice of mobile carrier services, as part of the Mobile Black Spot Program. As such, the facility will provide improved coverage to the surrounding area.	✓
Telecommunications infrastructure should be co-located and whenever possible: Cables and lines should be located within an existing underground conduit or duct; and Overhead lines and towers should be co-located with existing infrastructure and/or within an existing infrastructure corridor and/or mounted on existing or proposed buildings.	As per Section 7 of this report, no opportunities for co-location were identified in the area and as such it has been identified that the proposed Telstra site location is seen as the preferred site location. As this is a greenfield site there is no option to utilise existing underground conduit or ducts. Overhead lines are not applicable to this application.	✓



10.0 Local Regulatory Framework

The following information provides a summary of the Local provisions relevant to telecommunications development proposals.

10.1 Shire of Gingin Local Planning Scheme No. 9

The *Shire of Gingin Local Planning Scheme No. 9* provides the legal basis for planning in the Shire of Gingin Local Government Area.

The proposed site is zoned 'Public Use: Service and Infrastructure' as shown in **Figure 5** below.

The Shire of Gingin Local Planning Scheme defines 'Telecommunications Infrastructure' as being:

land used to accommodate any part of the infrastructure of a communications network and includes any line, equipment, apparatus, tower, antenna, tunnel, duct, hole, pit or other structure used, or for use in or in connection with, a telecommunications network;

For the purposes of this proposal the Principal Designated Use of the property is 'Rural'.

Telecommunications infrastructure is not an assessable use within the Public Use zoning and therefore Item 3.4.2 and Item 5.3 of the Town Planning Scheme is applicable.

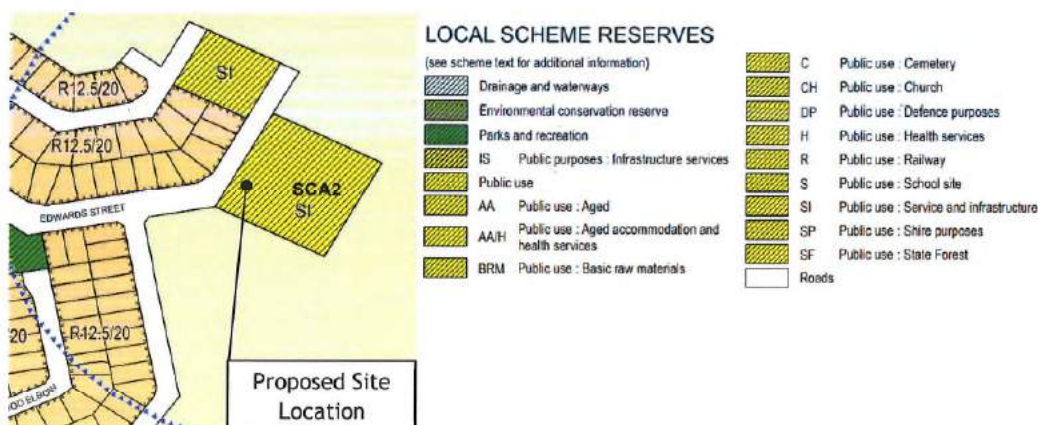


Figure 5: Zoning Map 11 (Shire of Gingin Local Planning Scheme No 9) (Source: Dept. of Planning)

The proposal has been sited to retain the land for its current use, and minimise visual impact. The detailed siting has been undertaken with direction from the land owner to ensure the primary use of the land and any potential future use of surrounding land is not negatively impacted upon.

Overall the proposed development application is consistent with the intent and requirements of Western Australian Planning Commission SSP 5.2 and the Shire of Gingin Local Planning Scheme No 9.

11.0 General Provisions

This proposal is for the establishment of a Telstra Mobile Base Station Facility in the Seabird area.

Telstra considers that the proposal is appropriate for the locality, given the 'Public Use: Service and Infrastructure' zoning of the proposed site and the nature of existing and anticipated uses of surrounding



land. There will be no impact towards the natural and built environment(s) within the direct vicinity of the proposed site.

Environmental considerations such as visual impact, heritage, flora and fauna, traffic, flooding, bushfire, social and economic aspects, health and safety have been discussed within the below sub sections.

11.1 Visual Impacts

Mobile network coverage objectives determine where a mobile telephone base station is required. However, the State Planning Policy 5.2 – Telecommunications Infrastructure notes that for the operation of such facilities “antennas generally need to be mounted clear of surrounding obstructions like trees and buildings to avoid loss of reception and to allow each mobile telephone base station to cover its intended cell with minimum transmitter power. They must also be sited where they will not interfere with neighboring cells”. A notion which has been supported by the State Administrative Tribunal, who note that “the planning framework does not require the tower to be invisible.” Telstra Corporation vs. Shire of Waroona [2012] WASAT 179. As a result, this often means that such facilities are visible from surrounding areas.

Telstra commences the site selection process with a search of potential sites that meet the network’s technical requirements, with a view to also having the least possible impact on the surrounding area. Telstra applies and evaluates a range of criteria as part of this site selection process.

There are also a number of other important criteria that Telstra uses to assess options and select sites that may be suitable for a proposed new facility. These take into account factors other than the technical performance of the site, and include:

- The potential to co-locate on an existing telecommunications facility.
- The potential to locate on an existing building or structure.
- Visual impact and the potential to obtain relevant town planning approvals.
- Proximity to community sensitive locations and areas of environmental heritage.
- The potential to obtain tenure at the site.
- The cost of developing the site and the provision of utilities (power, access to the facility and transmission links).

Telstra is also contracted to meet objectives of the Mobile Black Spot Program, with parameters set by the Federal Government. A number of factors determined which areas received funding, including the lack of outdoor coverage and the number of people who would benefit from a new facility.

Through careful analysis and rigorous site selection processes, Telstra investigated six additional alternative candidates in the area, which as a result it was determined that the proposed facility located at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird, was able to most appropriately meet the aforementioned criteria.

Notwithstanding, Telstra makes every effort to design base station infrastructure that is visually unobtrusive; in this regard, Telstra is proposing to install a 40m monopole which has been sited to maintain the primary use of the land whilst considering the visual impact to the surrounding area. The site carefully considered environmental and visual constraints, existing and future land use characteristics, the orderly planning of the area and the design of the facility. Through siting the facility near existing tall structures (Water Tank) and also on land currently used for infrastructure to the east of the township in addition to also considering the future growth of the region and also the predominant view shed to the west (towards the coast) Visionstream on behalf of Telstra believe that the proposed facility will, on balance, ensure optimal service provision to the area whilst minimizing any perceived visual impact.

In addition, the site has been situated as to be setback as far as possible from any residential properties as to not detract from any views or amenity of the surrounding area.



11.2 Heritage

In order to determine any possible natural or cultural values of state or national significance associated with the site, a search was conducted through the relevant Heritage Registers.

No sites of Aboriginal Heritage significance were identified within the subject land holding or surrounding area.

11.3 Flora and Fauna

In order to determine any possible natural Flora and Fauna significance associated with the site, a search was conducted through the relevant environmental searches.

Searches identified the potential of 1 threatened ecological community, 36 threatened and 34 migratory species of Flora and Fauna significance located within a 1km radius of the proposed site. See **Appendix G – Environment Analysis Report** for further information.

Access to the proposed facility will be off the existing track from Edwards Street. Some minor clearing will be required for the compound, firebreak and minor access track. It is expected that this minor clearing will not impact on the aforementioned flora and fauna or impact the visual perceptions of the site.

The site is not located in an area of environmental significance as defined by The *Telecommunications (Low-Impact Facilities) Determination 1997*.

11.4 Traffic

Mobile phone base stations are not a significant generator of pedestrian or vehicular traffic.

The site will be visited on a quarterly basis throughout the year for maintenance purposes.

During the construction phase various vehicles will be used to deliver equipment and construct the Telstra Mobile Base Station Facility. Any traffic impacts associated with construction and establishment will be of a short-term duration (i.e. approximately five weeks over non-consecutive periods) and are not anticipated to adversely impact on the surrounding road network.

Adequate parking will be available on site for these vehicles and these movements would not impact the local traffic.

Traffic from this construction would only occur from the hours of 7am to 6pm. If a road closure is required for the erection and installation of equipment, the appropriate approvals will be obtained from the Department of Transport (DOT).

The mobile base station facility is unmanned would require maintenance checks approximately 3-4 times per year as required. Routine maintenance would involve one vehicle per visit and parking would be available close to the proposed site for this purpose.

11.5 Access

Access to the proposed site will be via the existing gated Water Corporation access track off Edwards Street. In this regard, there is no requirement for special access to the site. (Refer to **Appendix B – Proposal Plans (S1)** for more information)

The proposed site access is considered to be appropriate given the Telstra facility will not be a significant generator of traffic. Once operational, the facility will require maintenance visits approximately 3-4 times per year as required, but will remain unattended at all other times. As the facility generates minimal visits per year, it is considered that traffic interference will be negligible.



During the construction phase various vehicles will be used to deliver equipment and construct the Telstra Mobile Base Station Facility. Any traffic impacts associated with construction and establishment will be of a short-term duration (i.e. approximately five weeks over non-consecutive periods) and are not anticipated to adversely impact on the surrounding road network. Adequate parking would be available in the vicinity for vehicles used during construction and these movements would not impact local traffic. In the unlikely event that road closure is required Telstra will apply to the relevant authorities for permission.

11.6 Utilities

An application has been made to the local utility company confirming route and availability of power supply for this site. The proposed site does not require any additional permits for the connection of a sewer/roadway.

11.7 Construction

The construction of the mobile base station will take approximately five weeks over non-consecutive periods, subject to weather.

Noise and vibration emissions associated with the Telstra Mobile Base Station Facility will be limited to the construction phase. Noise generated during the construction phase will be of short duration and will be in accordance with the standards outlined in the Environmental Protection (Noise) Regulations 1997. Construction works will only occur between the hours of 7am and 6pm.

There will be some low level noise from the ongoing operation of air conditioning equipment associated with the equipment shelter, once installed. Noise emanating from the air conditioning equipment is at a comparable level to a domestic air conditioning installation, and will generally accord with the background noise levels prescribed by Australian Standard AS1055.

The proposed site is appropriately setback from residential properties so that the noise related impacts will be negligible.

11.8 Bushfire

The specific site location is identified as a Bush Fire Prone Area by the Fire and Emergency Services Commissioner (See Figure 6).

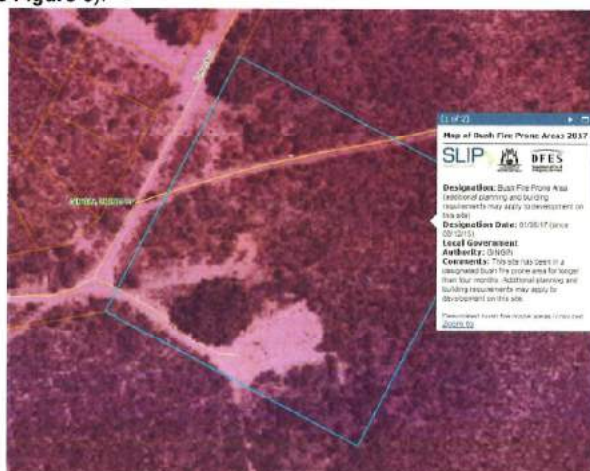


Figure 6 – Bushfire Prone Areas Mapping (Source DFES Slip Mapping)



Natural disasters, including the continuing threat of bushfires, have served to highlight the critical importance of effective telecommunications. Previous bushfire incident reviews have demonstrated effective telecommunications networks are essential for disaster response management, allowing emergency services providers to be alerted to medical or fire emergencies.

In its Communications Report 2014-2015 the Australian Communications and Media Authority reported that in 2014 -15, 66.9% of calls to the 000 emergency number were made from mobile phones. As such, in addition to day-to-day personal and business applications, effective telecommunications networks can be the difference between life and death in disaster situations.

The entirety of the facility will be earthed in accordance with the Australian Standard. Earthing draws any the strike underground away from combustible material. It is submitted that contrary to being a risk factor for fires, the site in this case could reduce the risk of lightning strike causing fires, by attracting the strike and earthing it underground.

The State Planning Policy 3.7 provides the foundation for land use planning to address bushfire risk management in Western Australia. Notwithstanding the Department of Planning updated [Planning Bulletin 111/2016](#) to clarify that for telecommunications infrastructure, SPP 3.7 should be applied pragmatically.

The Planning Bulletin states:

"Exemptions from the requirements of SPP 3.7 and the deemed provisions should be applied pragmatically by the decision maker. If the proposal does not result in the intensification of development (or land use), does not result in an increase of residents or employees; or does not involve the occupation of employees on site for any considerable amount of time, then there may not be any practicable reason to require a BAL Assessment. Exemptions may apply to infrastructure including roads, telecommunications and dams; and to rural activities, including piggeries and chicken farms which do not involve employees on site for a considerable amount of time."

With respect to the above, Visionstream on behalf of Telstra believes that all necessary design measures have been undertaken to ensure the facility does not increase or affect the bushfire risk to the area.

11.9 Health and Safety

Telstra acknowledges some people are genuinely concerned about the possible health effects of electromagnetic energy (EME) from mobile phone base stations and is committed to addressing these concerns responsibly.

Telstra, along with the other mobile phone carriers, must strictly adhere to Commonwealth Legislation and regulations regarding mobile phone facilities and equipment administered by the Australian Communications and Media Authority (ACMA).

In 2003 the ACMA adopted a technical standard for continuous exposure of the general public to RF EME from mobile base stations. The standard, known as the *Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003*, was prepared by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and is the same as that recommended by ICNIRP (International Commission for Non- Ionising Radiation Protection), an agency associated with the World Health Organisation (WHO). Mobile carriers must comply with the Australian Standard on exposure to EME set by the ACMA.

The Standard operates by placing a limit on the strength of the signal (or RF EME) that Telstra can transmit to and from any network base station. The general public health standard is not based on distance limitations, or the creation of "buffer zones". The environmental standard restricts the signal strength to a level low enough to protect everyone at all times. It has a significant safety margin, or precautionary approach, built into it.

In order to demonstrate compliance with the standard, ARPANSA created a prediction report using a standard methodology to analyse the maximum potential impact of any new telecommunications facility. Carriers are obliged to undertake this analysis for each new facility and make it publicly available.



Importantly, the ARPANSA-created compliance report demonstrates the maximum signal strength of a proposed facility, assuming that it's handling the maximum number of user's 24-hours a day.

In this way, ARPANSA requires network carriers to demonstrate the greatest possible impact that a new telecommunications facility could have on the environment, to give the community greater peace of mind. In reality, base stations are designed to operate at the lowest possible power level to accommodate only the number of customers using the facility at any one time. This design function is called "adaptive power control" and ensures that the base station operates at minimum, not maximum, power levels at all times.

Using the ARPANSA standard methodology, Telstra is required to complete and make available an EME report which predicts the maximum environmental EME level the facility will emit. Telstra has undertaken a compliance report that predicts the maximum levels of radiofrequency EME from the proposed installation at Lot 9916 on DP183928, Reserve 36684, Edwards Street, Seabird WA 6042 to be 0.007% of the public exposure limit. The maximum environmental EME level predicted from this proposed facility is substantially within the allowable limit under the ARPANSA standard.

Refer to the EME Report attached at Appendix C.

Telstra relies on the expert advice of national and international health authorities such as the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the World Health Organisation (WHO) for overall assessments of health and safety impacts.

The WHO advises that all expert reviews on the health effects of exposure to radiofrequency fields have concluded that no adverse health effects have been established from exposure to radiofrequency fields at levels below the international safety guidelines that have been adopted in Australia.

Telstra has strict procedures in place to ensure its mobile phones and base stations comply with these guidelines. Compliance with all applicable EME standards is part of Telstra's responsible approach to EME and mobile phone technology.

12.0 Conclusion

This application is a direct result of the community's requests for reliable telecommunications to be provided to Seabird and surrounding areas.

There is strong State policy support for telecommunications facilities if, when balancing improved telecommunications services with environmental impacts; including for example, visual impact and flood or fire hazard, a particular proposal provides a net community benefit.

The proposed works provide the community with reliable 4G access which in turn supports the various rural and tourist industries in the region and forms part of a wider plan to ensure reliable and accessible coverage during emergency situations such as bush fires.

The proposed telecommunications facility will form an integral component in Telstra's national 4GX network. This 4G service brings higher speeds and extra 4G coverage to a range of communities across the nation. 4GX will include services provided over Telstra's new 700MHz spectrum and deliver higher typical mobile speeds on compatible devices, allowing more Australians to experience more reliable connections and ultra-fast mobile internet.

Telstra have undertaken an assessment of the relevant matters as required by the Telecommunications Act 1997, State Legislation and the Shire of Gingin Local Planning Scheme No. 9. The proposal is considered appropriate in light of the relevant legislative, environmental, technical, radio coverage and public safety requirements.

The assessment of the proposal demonstrates that the proposal represents sound and proper town planning and it is respectfully requested that consent is granted for this development application.

Should Council have any further queries regarding the subject application, please do not hesitate to contact the nominated representative outlined within this document.



Appendix A – Certificate of Title

WESTERN



AUSTRALIA

**RECORD OF QUALIFIED CERTIFICATE
OF
CROWN LAND TITLE**

**UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997
NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTER NUMBER	
9916/DPI83928	
Duplicate Edition	Date Duplicate Issued
N/A	N/A

VOLUME **LR3143** FOLIO **501**


REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 9916 ON DEPOSITED PLAN 183928

**STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)**

STATUS ORDER/INTEREST: RESERVE UNDER MANAGEMENT ORDER

PRIMARY INTEREST HOLDER: WATER CORPORATION

(XE G279760) REGISTERED 13/9/1996

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)**

1. G279760 PART RESERVE 36684 FOR THE PURPOSE OF WATER SUPPLY REGISTERED 13/9/1996.
G279760 MANAGEMENT ORDER. CONTAINS CONDITIONS TO BE OBSERVED. REGISTERED 13/9/1996.

Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

-----END OF CERTIFICATE OF CROWN LAND TITLE-----

STATEMENTS:

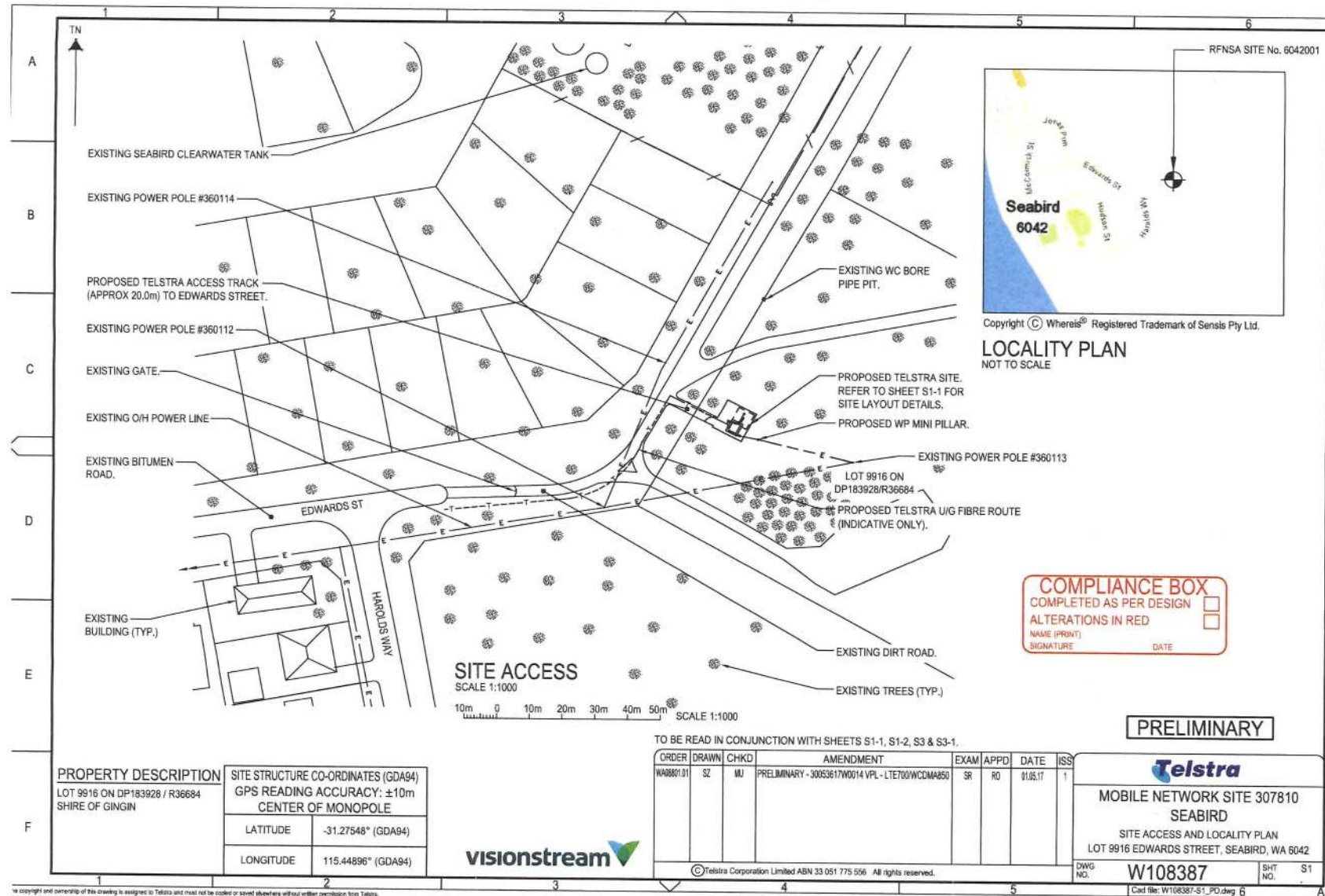
The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents of for local government, legal, surveying or other professional advice.

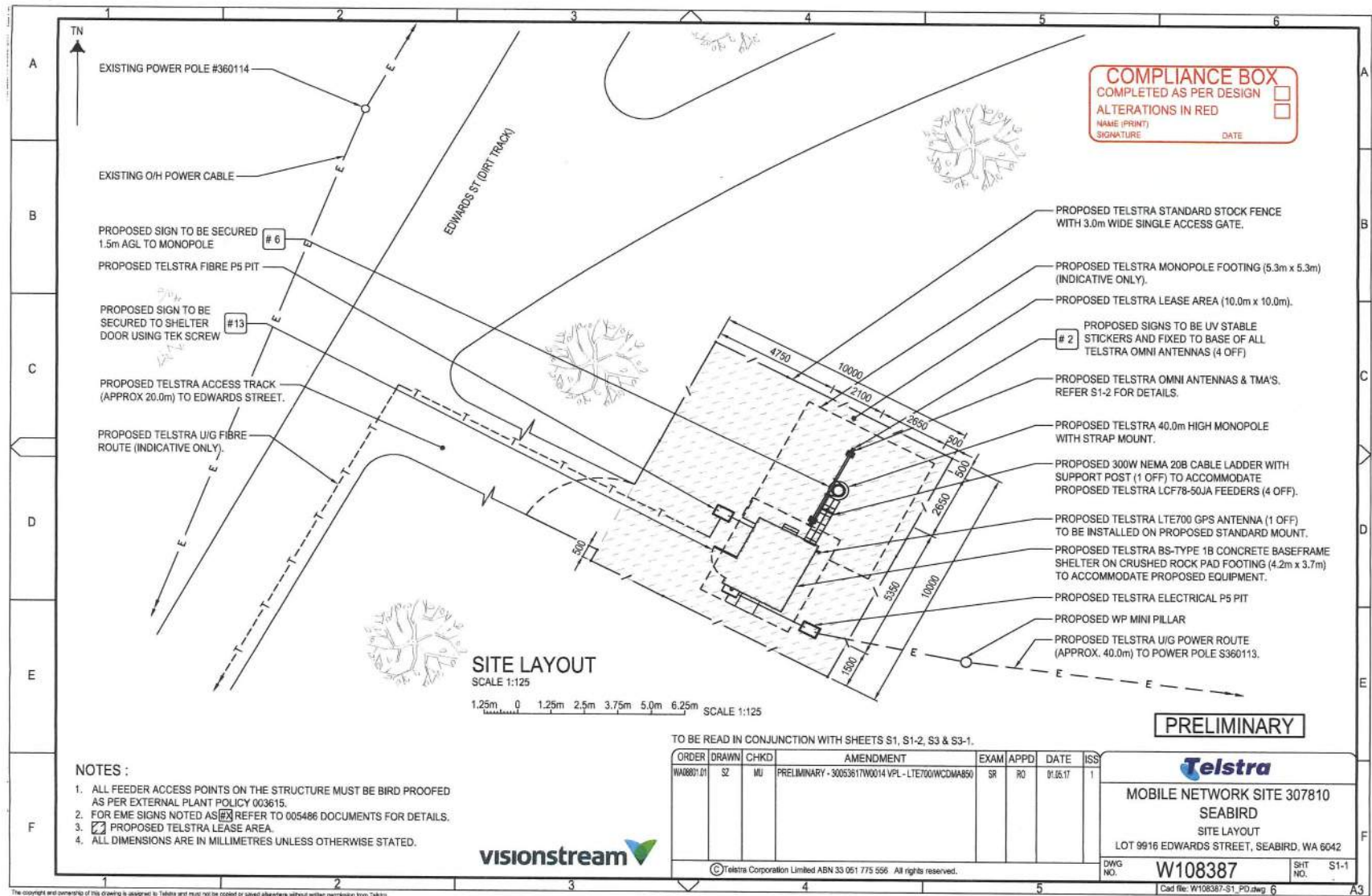
SKETCH OF LAND: DP183928
PREVIOUS TITLE: LR3050-336
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY: SHIRE OF GINGIN
RESPONSIBLE AGENCY: WATER CORPORATION

NOTE 1: K133486 CORRESPONDENCE FILE 02821-1978-01RO

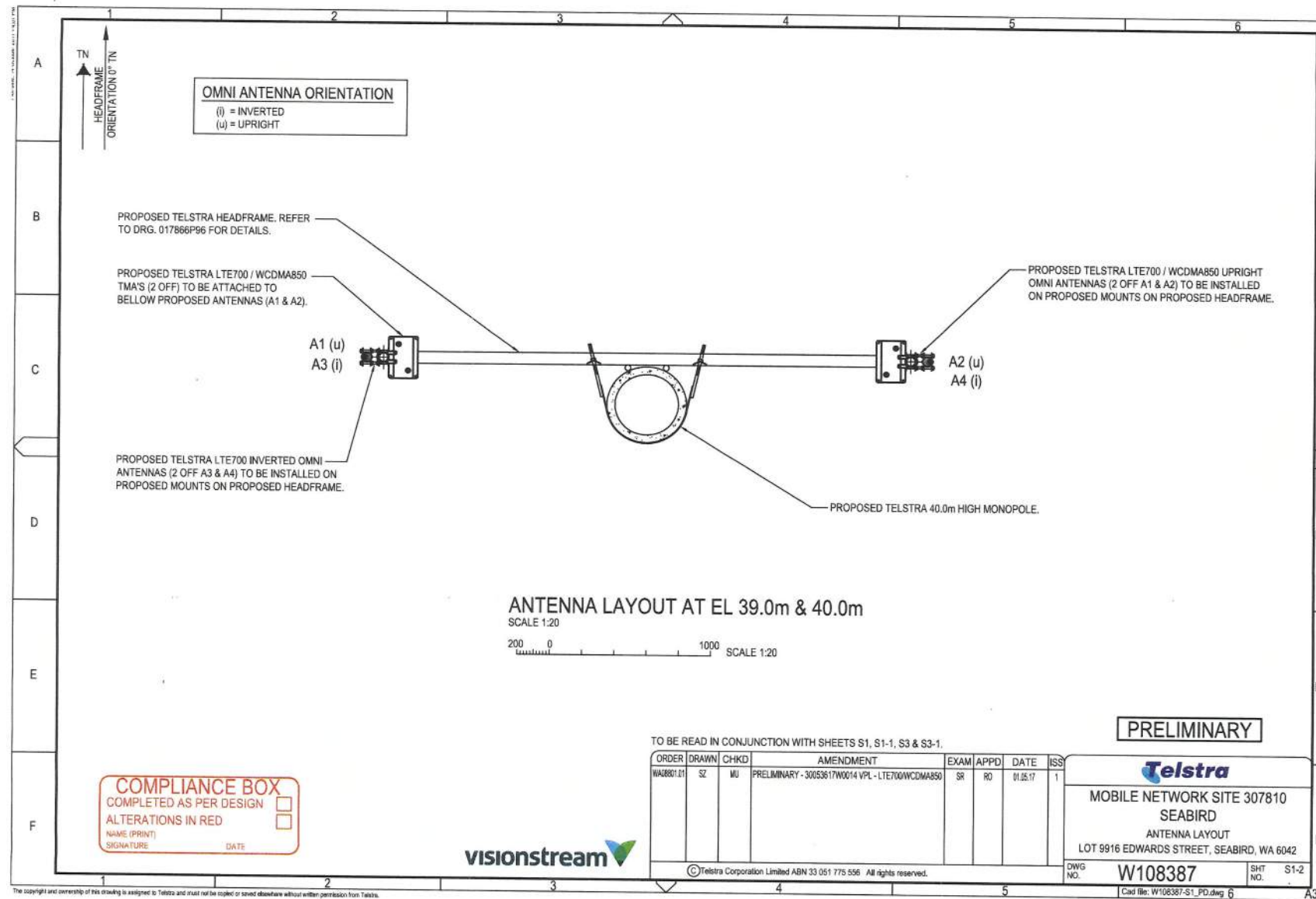


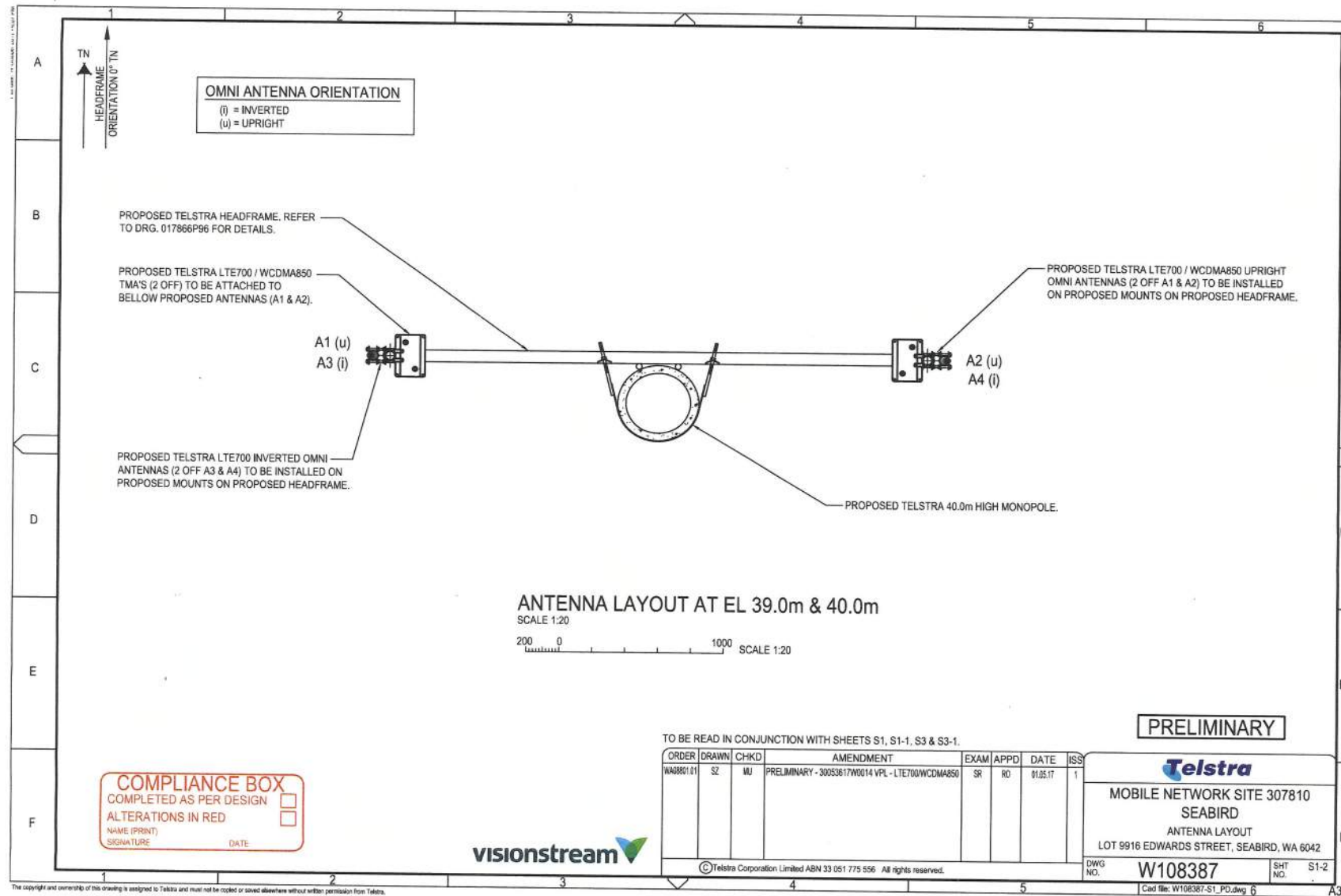
Appendix B – Plans of the Proposal













Environmental EME Report

Lot 9916 on DP183928 Reserve 36684 Edwards Street, SEABIRD WA 6042

This report provides a summary of Calculated RF EME Levels around the wireless base station

Date 20/10/2017

RFNSA Site No. 6042001

Introduction

The purpose of this report is to provide calculations of EME levels from the existing facilities at the site and any proposed additional facilities.

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless base station at Lot 9916 on DP183928 Reserve 36684 Edwards Street SEABIRD WA 6042. These levels have been calculated by Telstra using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

The maximum EME level calculated for the proposed systems at this site is 0.007% of the public exposure limit.

The ARPANSA Standard

ARPANSA, an Australian Government agency in the Health and Ageing portfolio, has established a Radiation Protection Standard specifying limits for general public exposure to RF transmissions at frequencies used by wireless base stations. The Australian Communications and Media Authority (ACMA) mandates the exposure limits of the ARPANSA Standard.

How the EME is calculated in this report

The procedure used for these calculations is documented in the ARPANSA Technical Report "Radio Frequency EME Exposure Levels - Prediction Methodologies" which is available at <http://www.arpansa.gov.au>.

RF EME values are calculated at 1.5m above ground at various distances from the base station, assuming level ground.

The estimate is based on worst-case scenario, including:

- wireless base station transmitters for mobile and broadband data operating at maximum power
- simultaneous telephone calls and data transmission
- an unobstructed line of sight view to the antennas.

In practice, exposures are usually lower because:

- the presence of buildings, trees and other features of the environment reduces signal strength
- the base station automatically adjusts transmit power to the minimum required.

Maximum EME levels are estimated in 360° circular bands out to 500m from the base station.

These levels are cumulative and take into account emissions from all wireless base station antennas at this site.

The EME levels are presented in three different units:

- volts per metre (V/m) – the electric field component of the RF wave
- milliwatts per square metre (mW/m²) – the power density (or rate of flow of RF energy per unit area)
- percentage (%) of the ARPANSA Standard public exposure limit (the public exposure limit = 100%).

Results

The maximum EME level calculated for the proposed systems at this site is 0.32 V/m; equivalent to 0.27 mW/m² or 0.007% of the public exposure limit.

Radio Systems at the Site

There are currently no existing radio systems for this site.

It is proposed that this base station will have equipment for transmitting the following services:

Carrier	Radio Systems
Telstra	WCDMA850 (proposed), LTE700 (proposed)

Calculated EME Levels

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined.

Distance from the antennas at Lot 9916 on DP183928 Reserve 36684 Edwards Street in 360° circular bands	Maximum Cumulative EME Level at 1.5m above ground – all carriers at this site					
	Existing Equipment			Proposed Equipment		
	Electric Field V/m	Power Density mW/m ²	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m ²	% ARPANSA exposure limits
0m to 50m				0.29	0.22	0.0055%
50m to 100m				0.29	0.22	0.0058%
100m to 200m				0.24	0.15	0.0039%
200m to 300m				0.2	0.1	0.0026%
300m to 400m				0.29	0.22	0.0058%
400m to 500m				0.32	0.27	0.0069%
Maximum EME level				0.32	0.27	0.007
	550.28 m from the antennas at Lot 9916 on DP183928 Reserve 36684 Edwards Street					

Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest that have been identified through the consultation requirements of the Communications Alliance Ltd Deployment Code C564:2011 or via any other means. The calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Additional Locations		Height / Scan relative to location ground level	Maximum Cumulative EME Level All Carriers at this site Existing and Proposed Equipment		
			Electric Field V/m	Power Density mW/m ²	% of ARPANSA exposure limits
1	Resident 1	0m to 4m	0.2	0.11	0.0027%
2	Resident 2	0m to 4m	0.2	0.11	0.0027%
3	Resident 3	0m to 4m	0.2	0.1	0.0026%

RF EME Exposure Standard

The calculated EME levels in this report have been expressed as percentages of the ARPANSA RF Standard and this table shows the actual RF EME limits used for the frequency bands available. At frequencies below 2000 MHz the limits vary across the band and the limit has been determined at the Assessment Frequency indicated. The four exposure limit figures quoted are equivalent values expressed in different units – volts per metre (V/m), watts per square metre (W/m²), microwatts per square centimetre (μW/cm²) and milliwatts per square metre (mW/m²). Note: 1 W/m² = 100 μW/cm² = 1000 mW/m².

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
LTE 700	758 – 803 MHz	750 MHz	37.6 V/m = 3.75 W/m ² = 375 μW/cm ² = 3750 mW/m ²
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m ² = 450 μW/cm ² = 4500 mW/m ²
GSM900, LTE900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m ² = 450 μW/cm ² = 4500 mW/m ²
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m ² = 900 μW/cm ² = 9000 mW/m ²
LTE2100, WCDMA2100	2110 – 2170 MHz	2100 MHz	61.4 V/m = 10.00 W/m ² = 1000 μW/cm ² = 10000 mW/m ²
LTE2300	2302 – 2400 MHz	2300 MHz	61.4 V/m = 10.00 W/m ² = 1000 μW/cm ² = 10000 mW/m ²
LTE2600	2620 – 2690 MHz	2600 MHz	61.4 V/m = 10.00 W/m ² = 1000 μW/cm ² = 10000 mW/m ²
LTE3500	3425 – 3575 MHz	3500 MHz	61.4 V/m = 10.00 W/m ² = 1000 μW/cm ² = 10000 mW/m ²

Further Information

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a Federal Government agency incorporated under the Health and Ageing portfolio. ARPANSA is charged with responsibility for protecting the health and safety of people, and the environment, from the harmful effects of radiation (ionising and non-ionising).

Information about RF EME can be accessed at the ARPANSA website, <http://www.arpansa.gov.au>, including:

- Further explanation of this report in the document "Understanding the ARPANSA Environmental EME Report"
- The procedure used for the calculations in this report is documented in the ARPANSA Technical Report; "Radio Frequency EME Exposure Levels - Prediction Methodologies"
- the current RF EME exposure standard
Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2002, 'Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz', Radiation Protection Series Publication No. 3, ARPANSA, Yallambie Australia.
[Printed version: ISBN 0-642-79400-6 ISSN 1445-9760] [Web version: ISBN 0-642-79402-2 ISSN 1445-9760]

The Australian Communications and Media Authority (ACMA) is responsible for the regulation of broadcasting, radiocommunications, telecommunications and online content. Information on EME is available at <http://emr.acma.gov.au>

The Communications Alliance Ltd Industry Code C564:2011 'Mobile Phone Base Station Deployment' is available from the Communications Alliance Ltd website, <http://commsalliance.com.au>.

Contact details for the Carriers (mobile phone companies) present at this site and the most recent version of this document are available online at the Radio Frequency National Site Archive, <http://www.rfnsa.com.au>.



Appendix D – Fact Sheets





Australian Government
Department of Communications

COMMUNICATIONS TOWERS, RADIO TRANSMITTERS AND SAFETY

Information for communities and their parliamentary representatives

Radio transmitters—Are they safe?

Some people may have concerns about possible health effects from exposure to electromagnetic energy (EME) coming from radiocommunications transmitters on towers and elsewhere. This factsheet outlines the steps the Australian Government takes to keep Australians safe.

Exposure to radiofrequency (RF) EME has been the subject of detailed research by experts. Exposure limits are set well below the level at which adverse health effects are known to occur and include a wide safety margin to protect the public.

What is EME?

RF EME is the energy in radio waves, and is used for wireless communication. It has been in use for over 100 years. It is used to send and receive signals between communications equipment such as broadcast towers, radios and televisions, mobile phone towers and phones, radar facilities, and electrical and electronic equipment. It is also part of our natural environment.

How is EME regulated?

Two Australian Government agencies, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the Australian Communications and Media Authority (ACMA), are responsible for regulating RF EME exposure.

ARPANSA is an independent Australian Government agency charged with protecting Australians from exposure to EME. ARPANSA is responsible for advising what safe levels of EME exposure are. ARPANSA has developed a public health standard which sets limits for human exposure to RF EME. The limits are set well below the level at which adverse health effects are known to occur and include a wide safety margin to protect the public. The exposure standards take into account the many sources of RF EME present in the modern environment.

The ACMA licenses the operation of radiocommunications transmitters. Licences require transmitters to comply with the exposure limits set out in the ARPANSA standard.

How much EME comes from radio transmitters?

All transmitters must operate below ARPANSA's public exposure standard. Typically transmitters operate at a tiny percentage of the ARPANSA standard.

Is the scientific information on EME up to date?

ARPANSA maintains continual oversight of emerging research into the potential health effects of EME exposure in order to provide accurate and up-to-date advice to the Government. ARPANSA works with the World Health Organisation in researching the health effects of human exposure to EME. Should scientific evidence indicate that the current ARPANSA standard does not adequately protect the health of Australians, the Government would take immediate action to rectify the situation.



NBN wireless towers

Currently, as part of the rollout of the National Broadband Network (NBN), a number of new fixed wireless towers are being built across Australia. These are subject to the same strict EME safety limits set by ARPANSA. As such, exposure to EME should not be a concern.

People can, however, also be concerned about the appearance of towers and their visual impact in their communities. This can also be the case with other facilities, for example mobile phone base stations. Approvals for the installation of free standing telecommunications towers are subject to state, territory and local government planning laws. NBN Co is required to follow the processes for community and local government consultations set out in these laws. People with concerns about proposed NBN towers should raise their concerns during the consultation process for each tower.

Where can I find out more information?

Further information is available from the following expert bodies:

Australian Radiation Protection and Nuclear Safety Agency
www.arpansa.gov.au

Australian Communications and Media Authority
www.acma.gov.au/Citizen/Consumer-info/Rights-and-safeguards/EME-hub

World Health Organisation
www.who.int/topics/electromagnetic_fields

International Commission on Non-Ionising Radiation Protection (ICNIRP)
www.icnirp.org

You can also find out more about transmitters in your community, including EME reports and community consultation information, from the Radio Frequency National Site Archive
www.rfnsa.com.au



Appendix E – Site Photographs



View from proposed facility looking North



View from proposed facility looking South

visionstream 



View from proposed facility looking East



View from proposed facility looking West



Appendix F – Environment Analysis Report (EPBC)



Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 14/03/17 11:44:15

[Summary](#)

[Details](#)

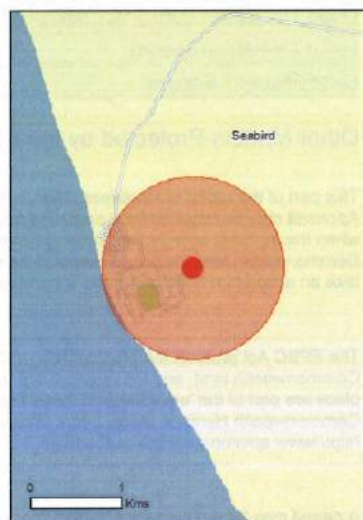
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
©Commonwealth of Australia
(Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	36
Listed Migratory Species:	34

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	14
Nationally Important Wetlands:	None
Key Ecological Features (Marine):	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops Australian Lesser Noddy [28000]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptrorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence area
<u>Macronectes halli</u> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<u>Pachyptila turtur subantarctica</u> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
<u>Phoebastria fusca</u> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
<u>Rostratula australis</u> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
<u>Sternula nereis nereis</u> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<u>Thalassarche cauta cauta</u> Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
<u>Thalassarche cauta steadi</u> White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<u>Thalassarche impavida</u> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<u>Thalassarche melanophris</u> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Mammals		
<u>Balaenoptera musculus</u> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<u>Dasyurus geoffroi</u> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<u>Eubalaena australis</u> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<u>Megaptera novaeangliae</u> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<u>Neophoca cinerea</u> Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Plants		
<u>Chorizema varium</u> Limestone Pea [16981]	Endangered	Species or species habitat likely to occur within area
<u>Diuris micrantha</u> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
<u>Eucalyptus argutifolia</u> Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species

Name	Status	Type of Presence
habitat likely to occur within area		
Reptiles		
<i>Caretta caretta</i>		
Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<i>Chelonia mydas</i>		
Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<i>Dermochelys coriacea</i>		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<i>Natator depressus</i>		
Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Sharks		
<i>Carcharias taurus</i> (west coast population)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<i>Carcharodon carcharias</i>		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<i>Rhincodon typus</i>		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		
		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<i>Anous stolidus</i>		
Common Noddy [825]		Species or species habitat likely to occur within area
<i>Apus pacificus</i>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<i>Diomedea amsterdamensis</i>		
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<i>Diomedea epomophora</i>		
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Diomedea exulans</i>		
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Macronectes giganteus</i>		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<i>Macronectes halli</i>		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<i>Phoebastria fusca</i>		
Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
<i>Puffinus carneipes</i>		
Flesh-footed Shearwater, Fleishy-footed Shearwater [1043]		Species or species habitat likely to occur within area
<i>Sterna anaethetus</i>		
Bridled Tern [814]		Foraging, feeding or related behaviour likely

Name	Threatened	Type of Presence
<u><i>Sterna caspia</i></u> Caspian Tern [59467]		to occur within area Foraging, feeding or related behaviour known to occur within area
<u><i>Sterna dougallii</i></u> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
<u><i>Thalassarche cauta</i></u> Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
<u><i>Thalassarche melanophris</i></u> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
<u><i>Balaenoptera edeni</i></u> Bryde's Whale [35]		Species or species habitat may occur within area
<u><i>Balaenoptera musculus</i></u> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<u><i>Carcharodon carcharias</i></u> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<u><i>Caretta caretta</i></u> Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
<u><i>Chelonia mydas</i></u> Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
<u><i>Dermochelys coriacea</i></u> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<u><i>Eubalaena australis</i></u> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<u><i>Lagenorhynchus obscurus</i></u> Dusky Dolphin [43]		Species or species habitat may occur within area
<u><i>Lamna nasus</i></u> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<u><i>Manta alfredi</i></u> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
<u><i>Manta birostris</i></u> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
<u><i>Megaptera novaeangliae</i></u> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<u><i>Natator depressus</i></u> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<u><i>Orcinus orca</i></u> Killer Whale, Orca [46]		Species or species habitat may occur within area
<u><i>Rhincodon typus</i></u> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within

Name	Threatened	Type of Presence
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle [943]		related behaviour likely to occur within area Species or species habitat likely to occur within area
<i>Larus pacificus</i> Pacific Gull [811]		 Foraging, feeding or related behaviour may occur within area
<i>Limosa lapponica</i> Bar-tailed Godwit [844]		Species or species habitat may occur within area
<i>Macronectes giganteus</i> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<i>Macronectes halli</i> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<i>Merops ornatus</i> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<i>Motacilla cinerea</i> Grey Wagtail [642]		Species or species habitat may occur within area
<i>Numenius madagascariensis</i> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<i>Pachyptila turtur</i> Fairy Prion [1086]		Species or species habitat likely to occur within area
<i>Pandion haliaetus</i> Osprey [952]		Species or species habitat may occur within area
<i>Phoebastria fusca</i> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
<i>Puffinus assimilis</i> Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
<i>Puffinus carneipes</i> Flesh-footed Shearwater, Fleishy-footed Shearwater [1043]		Species or species habitat likely to occur within area
<i>Rostratula benghalensis (sensu lato)</i> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
<i>Sterna anaethetus</i> Bridled Tern [814]		Foraging, feeding or related behaviour likely to occur within area
<i>Sterna caspia</i> Caspian Tern [59467]		Foraging, feeding or related behaviour known to occur within area
<i>Sterna dougalli</i> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
<i>Thalassarche cauta</i> Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within

Name	Threatened	Type of Presence area
Migratory Terrestrial Species		
<i>Motacilla cinerea</i> Grey Wagtail [842]		Species or species habitat may occur within area
Migratory Wetlands Species		
<i>Calidris ferruginea</i> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<i>Limosa lapponica</i> Bar-tailed Godwit [844]		Species or species habitat may occur within area
<i>Numenius madagascariensis</i> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<i>Pandion haliaetus</i> Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
<i>Anous stolidus</i> Common Noddy [825]		Species or species habitat likely to occur within area
<i>Anous tenuirostris melanops</i> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
<i>Apus pacificus</i> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<i>Ardea alba</i> Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
<i>Ardea ibis</i> Cattle Egret [59542]		Species or species habitat may occur within area
<i>Calidris ferruginea</i> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<i>Diomedea amsterdamensis</i> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
<i>Diomedea epomophora</i> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Diomedea exulans</i> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Diomedea sanfordi</i> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or

Name	Threatened	Type of Presence area
<u>Thalassarche impavida</u> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<u>Thalassarche melanophris</u> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<u>Thalassarche steadi</u> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Fish		
<u>Acantronura australe</u> Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
<u>Campichthys galei</u> Gale's Pipefish [66191]		Species or species habitat may occur within area
<u>Choeroichthys suillus</u> Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
<u>Halicampus brocki</u> Brock's Pipefish [66219]		Species or species habitat may occur within area
<u>Hippocampus angustus</u> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<u>Hippocampus breviceps</u> Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
<u>Hippocampus subelongatus</u> West Australian Seahorse [66722]		Species or species habitat may occur within area
<u>Lissocampus fatiloquus</u> Prophet's Pipefish [66250]		Species or species habitat may occur within area
<u>Maroubra perserrata</u> Sawtooth Pipefish [66252]		Species or species habitat may occur within area
<u>Mitotichthys meraculus</u> Western Crested Pipefish [66259]		Species or species habitat may occur within area
<u>Nannocampus subosseus</u> Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
<u>Phycodurus eques</u> Leafy Seadragon [66267]		Species or species habitat may occur within area
<u>Phyllopteryx taeniolatus</u> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
<u>Pugnaso curtirostris</u> Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
<u>Solegnathus lettiensis</u> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stigmatopora olivacea a pipefish [74966]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Reptiles		
Aipysurus pooleorum Shark Bay Seasnake [66061]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
Whales and other Cetaceans		
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area

Name	Status	Type of Presence
<u>Balaenoptera musculus</u> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<u>Delphinus delphis</u> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<u>Eubalaena australis</u> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<u>Grampus griseus</u> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<u>Lagenorhynchus obscurus</u> Dusky Dolphin [43]		Species or species habitat may occur within area
<u>Megaptera novaeangliae</u> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<u>Orcinus orca</u> Killer Whale, Orca [46]		Species or species habitat may occur within area
<u>Stenella attenuata</u> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<u>Tursiops aduncus</u> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<u>Tursiops truncatus s. str.</u> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
<u>Anas platyrhynchos</u> Mallard [974]		Species or species habitat likely to occur within area
<u>Columba livia</u> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<u>Streptopelia senegalensis</u> Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Mammals		
<i>Felis catus</i> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<i>Oryctolagus cuniculus</i> Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
<i>Asparagus asparagoides</i> Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
<i>Brachiaria mutica</i> Para Grass [5879]		Species or species habitat may occur within area
<i>Cenchrus ciliaris</i> Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
<i>Chrysanthemoides monilifera</i> Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
<i>Genista</i> sp. X <i>Genista monspessulana</i> Broom [67538]		Species or species habitat may occur within area
<i>Olea europaea</i> Olive, Common Olive [9160]		Species or species habitat may occur within area
<i>Pinus radiata</i> Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-31.27511 115.4492

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.



Appendix G – Photomontage

Photomontage

WA08801.01 Seabird

Telstra National Black Spot Program

visionstream 

Disclaimer

This photomontage has been prepared by Mackinlay Mackenzie for the use of Visionstream Australia Pty Ltd on behalf of Telstra Corporation Ltd as supporting information with respect to a proposed Telecommunications Facility to be located at Lot 9916 on Deposited Plan 183928, Reserve 36684, Edwards Street, Seabird WA 6042 as part of the Telstra National Mobile Black Spot Program.

The information provided within this report has been prepared by Mr. Thomas Mackenzie of Mackinlay Mackenzie with support and imagery provided by Visionstream Australia Pty Ltd.

The resulting montages are considered to be artist impressions only and may not fully represent the final product or views. Notwithstanding, the images have been presented to show as accurately as possible the proposal.

Background

The images contained within the photomontage were taken by Mr. Adam Wood & Mr. Brent McLeod of Visionstream Australia Pty Ltd.

The images were collected on Wednesday 15th March 2017 and have sought to locate areas where the site could potentially be viewed.

A Nikon Coolpix L830 Digital Camera was used to acquire the photographs used for montage purposes and were taken from eye level, 90° perpendicular to the ground level and no zoom.

The images contained within the report are considered to be artist impressions only and may not fully represent the final product or views. Notwithstanding, the images have been presented to show as accurately as possible the proposal.

Photomontage Locations



Subject Site: Lot 9916 on Deposited Plan 183928, Reserve 36684, Edwards Street, Seabird WA 6042
Coordinates: -31.275480°, 115.448960°

Location A: Corner Edwards Steet & Harolds Way
Location B: Harolds Way

Coordinates: -31.275891°, 115.447751°
Coordinates: -31.277678°, 115.448177°

Disclaimer: The attached photomontages are artist impressions only. Scale and bulk are approximate.

visionstream

Photo Location A

Corner Edwards Steet & Harolds Way - Coordinates: -31.275891°, 115.447751° - Approx. 125m from site - Orientation: 68°



Existing



Photo Location A

Corner Edwards Steet & Harolds Way - Coordinates: -31.275891° , 115.447751° - Approx. 125m from site - Orientation: 68°



With proposed

Photo Location B

Harolds Way - Coordinates: -31.277678°, 115.448177° - Approx. 257m from site - Orientation 17°



Existing

Photo Location B

Harolds Way - Coordinates: -31.277678° , 115.448177° - Approx. 257m from site - Orientation 17°



With proposed



This photomontage has been prepared by Mackinlay Mackenzie for the use of Visionstream Australia Pty Ltd on behalf of Telstra Corporation Ltd as supporting information with respect to a proposed Telecommunications Facility to be located at Lot 9916 on Deposited Plan 183928, Reserve 36684, Edwards Street, Seabird WA 6042 as part of the Telstra National Mobile Black Spot Program.

The information provided within this report has been prepared by Mr. Thomas Mackenzie of Mackinlay Mackenzie with support and imagery provided by Visionstream Australia Pty Ltd.

The resulting montages are considered to be artist impressions only and may not fully represent the final product or views. Notwithstanding, the images have been presented to show as accurately as possible the proposal.

For further information, please contact Adam Wood of Visionstream at Adam.Wood@Visionstream.com.au or (08) 6555 8518.

Visionstream Pty Ltd - ABN 80 062 604 193
35 - 37 Kewdale Road, Welshpool WA 6106



APPENDIX 2

SCHEDULE OF SUBMISSIONS AND RECOMMENDED RESPONSES

APPLICATION FOR DEVELOPMENT APPROVAL PROPOSED TELECOMMUNICATIONS INFRASTRUCTURE (MOBILE BASE STATION) ON LOT 9916 (RESERVE NO. 36684) EDWARDS STREET, SEABIRD

No.	Submitter	Submission Detail	Recommended Response
1.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>"...we take this opportunity to submit the following comments on the Planning Proposal outlined above. The Shire of Gingin is no doubt aware that mobile phone and cellular data reception within most of the town site of Seabird (including the Caravan Park) is unreliable at best and in the contemporary environment unacceptable for those of us who are required, by either personal or business circumstances, to maintain a reasonable level of communication with the outside world. This situation has been clearly recognised by the Federal Government with Seabird being prioritised as a "blackspot" under the national "Mobile Blackspot Program."</i></p> <p><i>The Planning Proposal subject of these comments seeks to address the predicament with the erection of a Mobile Base Station in Seabird.</i></p> <p><i>It is our view that this Planning Proposal presents an appropriate, effective and efficient solution to the current predicament and we strongly support the application, including site selection.</i></p> <p><i>Of concern is our understanding that the Shire of Gingin may prefer an alternative location for a Mobile Base Station in Seabird, at the local Refuse Disposal Site. Should that be the case we would trust that informed expert advice has been taken arriving at that preference.</i></p> <p><i>Whilst we have no technical expertise in the field of telecommunications a rudimentary examination of the Seabird topography would seem to clearly indicate that whilst the elevated parts of the Seabird town site, in the vicinity of Harold's Way, may well benefit from the siting of a Mobile Base Station at the Refuse Disposal Site it is questionable that most of the town site (which is situated at lower levels) would receive any appreciable signal improvement from that location. Our observation is that most of the Seabird</i></p>	<p>Although alternate sites may exist, the Shire is required to assess an Application for Development Approval based on the merits of the applicant's proposal. In this instance the applicant seeks approval for Telecommunications Infrastructure on Lot 9916, Reserve No. 36684 Edwards Street, Seabird and has been assessed accordingly against the relevant planning framework.</p> <p>Telstra examined a range of potential sites within the Seabird locality and concluded that the subject lot is the most appropriate location to provide the required coverage while minimising negative impacts on the visual amenity of the area amongst other things. Administration concurs that the site is suitable.</p>

		<p><i>town site is located in the "shadow" of elevated landscape between the town site and the Refuse Disposal Site and it is our experience that such "shadowing" presents a very effective barrier to good mobile phone and cellular data reception.</i></p> <p><i>The Planning Proposal offers a location for the Mobile Base Station that would be in direct line of site to most of the Seabird town site and clearly provides the best solution, not with standing that it may require minor compromised by some relation to aesthetics."</i></p>	
2.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
3.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
4.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
5.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
6.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>"Hidden location is appropriate. At last hopefully a strong and consistent mobile reception."</i></p>	Noted.
7.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
8.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>"Very strongly support."</i></p>	Noted.
9.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
10.	Ratepayer	The Submitter supports the above proposal and makes no comments.	Noted.
11.	Ratepayer	The Submitter supports the above proposal and makes the following comments:	Noted.

		<i>“The proposed development has the potential to greatly improve telecommunications in Seabird, which have been extremely problematic. We welcome the development.”</i>	
12.	Ratepayer	<p>The Submitter provides the following general comments:</p> <p><i>“Would like to know the radiation pattern. Also the amounts it admits”.</i></p>	<p>It is acknowledged that there is a degree of community concern with respect to perceived health impacts of Electromagnetic Energy (EME) associated with mobile telephone networks. Telecommunication facilities are statutorily required to operate in compliance within science based limits which are recognised as providing appropriate protection for members of the community.</p> <p>Telstra rely on the expert advice of scientific bodies such as the World Health Organisation (WHO) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The weight of national and international scientific opinion is that there is no substantiated evidence of health effects as a result of mobile base stations that comply with the national and international safety guidelines.</p> <p>In Australia, all telecommunications facilities are regulated by the Australian Communication and Media Authority (ACMA) which has strict regulatory arrangement in place with respect to EME exposure. The maximum predicted level of EME exposure with regards to this proposal is 0.007% of the maximum level prescribed by ACMA.</p> <p>For specific details with respect EME exposure for the mobile base station at the subject lot, please refer to <i>Appendix C – Environmental EME Report</i> of the applicants' proposal.</p>
13.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>“Fully support.”</i></p>	Noted.

14.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>"We are in support of this mobile station, as reception here in Seabird at present is quite bad for a lot of permanent residents. Hopefully this will remedy this situation."</i></p>	Noted.
15.	Ratepayer	<p>The Submitter does not support the proposal and makes the following comments:</p> <p><i>"... we would like to lodge our complete disapproval for the proposed Telecommunications Infrastructure (Mobile Base Station) Address Lot 9916 (Reserve No 36684) Edwards Street, Seabird.</i></p> <p><i>As a community, Seabird has been struggling to deal with seafront erosion, reducing population and diminishing services for several years. Erecting a mobile phone tower of this size and in this position, will further damage the ability of the community of Seabird to attract and maintain community members and landowners. Furthermore, it has the following negative impact ...</i></p> <p><i>. enjoyment of property</i></p> <p><i>.reduce value of land...perceived health risks and the aesthetic appearance.</i></p> <p><i>We request that the Planning Department do not approve this proposal and request that it be moved a distance from the community) at least 5km away from the current town housing borders) that reduces its impact on the landscape and the impact to the value if homes and land in the area."</i></p>	<p>It is expected that the installation of a mobile base station will improve access to mobile and broadband services, providing a positive benefit to the wider seabird community. This is considered to be an attraction for prospective community members and provide existing locals with an enhanced service.</p> <p>With respect to property values, there is no evidence to suggest a mobile base station would affect property valuations in any way.</p> <p>It is acknowledged that there is a degree of community concern with respect to perceived health impacts of Electromagnetic Energy (EME) associated with mobile telephone networks. Telecommunication facilities are statutorily required to operate in compliance within science based limits which are recognised as providing appropriate protection for members of the community.</p> <p>Telstra rely on the expert advice of scientific bodies such as the World Health Organisation (WHO) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The weight of national and international scientific opinion is that there is no substantiated evidence of health effects as a result of mobile base stations that comply with the national and international safety guidelines.</p> <p>In Australia, all telecommunications facilities are regulated by the Australian Communication and Media Authority (ACMA) which has strict regulatory arrangement in place with respect to EME exposure.</p>

			<p>The maximum predicted level of EME exposure with regards to this proposal is 0.007% of the maximum level prescribed by ACMA.</p> <p>Telstra examined a range of potential sites within the Seabird locality and concluded that the subject lot is the most appropriate location to provide the required coverage while minimising negative impacts on the visual amenity of the area. The proposed location is not considered to detract from views of significance, which are predominantly ocean views to the west of the existing residential areas.</p>
16.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>"Lack of mobile phone coverage in Seabird is a concern. Any development which improves coverage without impacting existing residents is welcomed."</i></p>	Noted.
17.	Ratepayer	The Submitter does not support the proposal and makes no comments.	Noted.
18.	Ratepayer	<p>The Submitter does not support the proposal and makes the following comments:</p> <p><i>"I respectfully advise that the Shire that the location of the mobile base station is not well situated given the proposed lots (yellow) for future development indicated on the map provided titles (Lot 9916 Edwards Street Seabird). I draw your attention to the fact that encouraging people to purchase and build upon them will become exceedingly difficult given the close proximity to the mobile tower. It will set the Shires future ambitions to develop Seabird back significantly into the foreseeable future. People have shown everywhere that where the tower has been placed there has been an enormous resistance to build residence near them. The location should be reviewed with it being shifted to a location much further from Seabird town site. Thanks."</i></p>	<p>The Shire is required to assess an Application for Development Approval based on the merits of the applicant's proposal. In this instance the applicant seeks approval for Telecommunications Infrastructure on Lot 9916, Reserve No. 36684 Edwards Street, Seabird and has been assessed accordingly against the relevant planning framework.</p> <p>Telstra examined a range of potential sites within the Seabird locality and concluded that the subject lot is the most appropriate location to provide the required coverage while minimising negative impacts on the visual amenity of the area. The proposed location is not considered to detract from views of significance, which are predominantly ocean views to the west of the existing residential areas.</p>

19.	Ratepayer	<p>The Submitter does not support the proposal and makes the following comments:</p> <p><i>“Unightly. .Reduce value of surrounding properties. .Discourage future development near the site and in the area. .Located too close to seashore which will spoil views in the area should be located further in land. . With so much vacant land in the area, surely a more isolated site could be found.”</i></p>	<p>There is no evidence to suggest a mobile base station would affect property valuations in any way. It is expected that the installation of a mobile base station will improve access to mobile and broadband services, providing a positive benefit to the wider Seabird community. This is considered to be an attraction for prospective community members and provide existing locals with an enhanced service.</p> <p>Telstra examined a range of potential sites within the Seabird locality and concluded that the subject lot is the most appropriate location to provide the required coverage while minimising negative impacts on the visual amenity of the area. The proposed location is not considered to detract from views of significance, which are predominantly ocean views to the west of the existing residential areas.</p> <p>The Shire is required to assess an Application for Development Approval based on the merits of the applicant's proposal. In this instance the applicant seeks approval for Telecommunications Infrastructure on Lot 9916, Reserve No. 36684 Edwards Street, Seabird and has been assessed accordingly against the relevant planning framework. Isolated sites do exist, however Telstra have concluded that the appropriate coverage be impeded.</p>
20.	Ratepayer	<p>The Submitter supports the above proposal and makes the following comments:</p> <p><i>“Improved communications important for safety reasons.”</i></p>	

21.	Seabird Progress & Sports Association Inc.	<p>Submitter makes the following comment:</p> <p><i>"The proposal was discussed at the recent SPA committee meeting, where the response was very positive. Communications in Seabird have been a problem for many years with lack of mobile telephone coverage being a major issue for many residents. The committee supports the proposal and hopes it will achieve some of the problems currently being experienced by residents and visitors to Seabird and surrounding areas."</i></p>	
22.	Department of Water and Environmental Regulation (DWER)	<p>Submitter makes the following comment:</p> <p><i>"The proposed development is situated within the Seabird Water Reserve and is managed for Priority 1 (p1) source protection . P1 source protection areas are defined to ensure there is no degradation of the water resource, and are managed with the principle of risk avoidance.</i></p> <p><i>The proposed telecommunication infrastructure is located within the only area of Priority 1 public drinking water reserve in the township of Seabird (see attachment). As such the DWER recommends an alternative location be sought to locate the proposed works to avoid risk to the town's drinking water supply.</i></p> <p><i>However, according to Water Quality Protection Note 25: Land Use Compatibility Tables for Public Drinking Water Source Areas (DoW, 2016), telecommunications infrastructure is compatible with conditions in a P1 area.</i></p> <p><i>As such, should the Shire of Gingin choose to support the development the DWER recommends the following condition:</i></p> <p><i>Water Management Plan</i></p> <p><i>A waster management plan should be prepared and approved, prior to the commencement of ground disturbing activities for the construction phase of the development, to the satisfaction of the DWER. The management plan should address, where relevant, the following Water Quality Protection Notes:</i></p> <p><i>. WQPN 10: Emergency Response</i></p>	<p>The Shire notes the significance of the Public Drinking Water Source Area, however is of the view that potential impacts during the construction phase can be appropriately managed. Once the construction phase is complete the long term management of the water source is not anticipated to be affected by the mobile base station.</p> <p>Appropriate conditions are recommended as requested.</p>

		<p>. WQPN 52: Stormwater management at industrial sites . WQPN83: Infrastructure corridors near sensitive water resources . WQPN 93: Light industry near sensitive waters.</p> <p>Whilst these notes are not directly relevant to telecommunications infrastructure, they do cover best management practises relating to construction activities in P1 areas. These best management practises should be adhered to, to prevent contamination of the water source."</p>	
23.	Air Services Australia	<p>Submitter makes the following comment:</p> <p>"With respect to procedures designed by Air services in accordance ICAO PANS-OPS and Document 9905, at a maximum height of 65.4m (215ft) AHD, the telecommunications tower will not affect any sector or circling altitude, nor any instrument approach or departure procedure at any nearby Airport. It will also not affect any overhead air routes.</p> <p>The telecommunications tower will not affect the Perth RTCC.</p> <p>Note that procedures not designed by Air services at any nearby Airport were not considered in this assessment.</p> <p>Communications/Navigation/Surveillance (CNS) Facilities</p> <p>This telecommunications tower to a maximum height of 65.4m (215ft) AHD will not adversely impact the performance of Precision/Non-Precision Nav Aids, HF/VHF Comms, A-SMGCS, Radar, pRM, ADS-B, WAM or Satellite/Links."</p>	General Comment – No response required.
24.	Department of Planning, Lands and Heritage	<p>Submitter makes the following comment:</p> <p>"The Western Australian Planning Commissions (WAPC) State Planning Policy 5.2" Telecommunications Infrastructure (SPP 5.2) and Visual Landscape Planning in Western Australia (2007) manual provides guidance on the location, siting and design of telecommunications infrastructure, including measures to address visual impacts. Section 5.1.1 of SPP 5.2 establishes that the benefit of improved telecommunications services should be balanced with the visual impact on the surrounding area.</p>	The Shire has considered State Planning Policy 5.2 - Telecommunications Infrastructure (SPP 5.2) and concurs that the proposal is consistent with the intent of the policy.

		<p><i>The proposed facility appears consistent with SPP 5.2's guiding principles and measures. Although the structure would be visible from much of Seabird, it would be at the rear of the settlement, while the main viewing direction is towards the ocean. Furthermore, the monopole's slim profile would aid its integration into the landscape.</i></p> <p><i>It is noted that signage is proposed from the antennae, therefore it is recommended that the visual impacts of the signage component are also considered.</i></p> <p><i>I trust that this information assists the Shire in determining the development application."</i></p>	
25.	Civil Aviation Safety Authority (CASA)	<p>Submitter makes the following comment:</p> <p><i>"CASA has reviewed the DA and I am advised that the proposed location is more than 20 NM from the nearest certified, registered or military aerodrome. However, if constructed, it will be located in D198 in proximity to the north south visual flight rules route and therefore the proposal should be referred to the Department of Defence for comment."</i></p>	Noted. The application was referred to the Department of Defence for comment.
26.	Department of Defence (Defence)	<p>Submitter makes the following comment:</p> <p><i>"It is understood that the application is for a telecommunications facilities (mobile phone base station), encompassing a 43.4 metre high monopole and ancillary components including equipment shelter. The proposal is for the towers to be built on Lot 9916 Edwards Street, Seabird.</i></p> <p><i>Defence has reviewed the proposal for any possible impact on the safety of flying operations. The supporting information submitted with the application notes that the proposed telecommunications antennas will not exceed a height of 43.3 metres above ground level (AGL) and as much meets the requirements for reporting of tall structures.</i></p> <p><i>There is an ongoing need to obtain and maintain accurate information about tall structures so that this information can be marked on aeronautical charts. Marking tall structures on aeronautical charts assists pilot navigation and enhances flight safety. Air Services Australia (ASA) is responsible for</i></p>	An appropriate condition will be recommended to require the applicant to provide the Department of Defence 'as constructed' details.

	<p><i>recording the location and height of all structures. The information is held in a central database by ASA and relates to the erection, extension or dismantling of tall structures the top of which is above:</i></p> <p><i>a. 30 metres AGL, that are within 30 kilometres of aerodrome, and</i> <i>b. 45 metres AGL elsewhere.</i></p> <p><i>The proposed structure will meet the above definition of tall structure. Defence therefore requests that the applicant provide ASA "as constructed" details. The details can be emailed to ASA at the following email address: vod@airservicesaustralia.com</i></p> <p><i>Please note that the proposed tower would need to comply with any Civil Aviation Safety Authority regulations in relation to tall structure requirements.</i></p> <p><i>Should you wish to discuss the content of this advice further, my point of contact is Mr Tim Hogan at DSRGIDEP.ExecutiveSupport@defence.gov.au or by telephone on (02) 6266 8193."</i></p>	
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APPENDIX 3



5th February 2018

Telstra Ref: WA08801.01Seabird

Attn: Alana Martinovich – PA Executive Assistant
Shire of Gingin
7 Brockman Street
Gingin
WA 6503

Via Email: pdpa@gingin.wa.gov.au

Attention: Ms. Martinovich – PA Executive Assistant

**Planning Application for proposed Telstra Telecommunications Facility located at on Lot 9916
Edwards Street, Seabird, WA 6042**

Visionstream wishes to thank Council for the opportunity to address the submissions received in response to the aforementioned planning application on behalf of Telstra Corporation Ltd. We trust that the response below will assist Council in addressing the concerns of the community and allow for a balanced assessment of the application.

Visionstream wishes to note that the majority of submissions are in support of the proposal. Only 4 of the 26 submissions raised formal opposition to the proposed development.

As put forward by Council via email on the 24th of January 2018, the issues raised can be summarised into the following categories:

1. Site Selection process
2. Visual impact
 - a. Construction Materials
3. EME & Health
4. Property values
5. Defence referral
6. Department of Water and Environmental Regulation (DWER)

Visionstream, on behalf of Telstra, trusts the above information will be useful and should the council require any further information or has any questions; please do not hesitate to contact Matthew Fletcher on (08) 6555 8518 or at matthew.fletcher@visionstream.com.au

Kind regards,



Matthew Fletcher
Planning Officer – Visionstream Pty Ltd





Site Selection Process

Telstra commences the site selection process with a search of potential sites that meet the network's technical requirements, with a view to also having the least possible impact on the surrounding area. Telstra applies and evaluates a range of criteria as part of this site selection process.

There are also a number of other important criteria that Telstra uses to assess options and select sites that may be suitable for a proposed new telecommunications facility. These take into account factors other than the technical performance of the site and include:

- The potential to co-locate on an existing telecommunications facility.
- The potential to locate on an existing building or structure.
- Visual impact and the potential to obtain relevant town planning approvals.
- Proximity to community sensitive locations and areas of environmental heritage.
- The potential to obtain tenure at the site.
- The cost of developing the site and the provision of utilities (power, access to the facility and transmission links).

Telstra is also contracted to meet objectives of the Mobile Black Spot Program, with parameters set by the Federal Government. A number of factors determined which areas received funding, including the lack of outdoor coverage and the number of people who would benefit from a new facility.

Through careful analysis and rigorous site selection processes Telstra investigated four candidates in the area and it was determined that the proposed facility located on Lot 9916 Edwards Street in Seabird was best able to meet the aforementioned criteria.

Visual Impact

Mobile network coverage objectives determine where a mobile telephone base station is required. However, in the *State Planning Policy 5.2 – Telecommunications Infrastructure*, it is noted that for the operation of such facilities "antennas generally need to be mounted clear of surrounding obstructions like trees and buildings to avoid the loss of reception and to allow each mobile telephone base station to cover its intended cell with minimum transmitter power. They must also be sited where they will not interfere with neighbouring cells". A notion which has been supported by the State Administrative Tribunal, which notes that "*the planning framework does not require the tower to be invisible.*" *Telstra Corporation vs. Shire of Waroona* [2012] WASAT 179. As a result, this often means that such facilities are visible from surrounding areas.

Nevertheless, Telstra makes every effort to design base station infrastructure that is visually unobtrusive. In this instance Telstra is proposing to install a 40m monopole which has been sited to maintain the primary use of the land whilst considering the visual impact on the surrounding area. The specific site location was selected as it is surrounded by areas of vegetation whilst also being at a high point of the land to achieve the required coverage objectives. Furthermore, the site is located approximately 150m from the nearest road (Edwards Street) and is approximately 140m from the nearest residential dwelling (2 Harolds Way). In addition, the proposed site is located close to the



only other tall structure in the town which is the water tower. By grouping these structures together the potential impact upon the visual amenity of the locality is further mitigated. Moreover, being sited further inland prevents any impact upon views of the coastline.

The site carefully considered environmental and visual constraints, existing and future land use characteristics, the orderly planning of the area and the design of the facility. On balance, it is considered that the location and height of the facility ensure optimal service provision to the area whilst minimizing any perceived visual impact.

Construction Materials

As previously noted, Telstra makes every effort to design base station infrastructure that is visually unobtrusive. With respect to the proposed site in Seabird, a 40m concrete monopole is proposed which will have a non-reflective standard grey concrete finish. In addition, the proposed Telstra equipment shelter is to be finished in a Colourbond 'Paperbark' colour which will allow the shelter to blend in with the surrounding environment.

In this regard, the design measures which have been considered seek to enable the proposed facility to blend in with the surrounding landscape as much as possible.

Finally, Telstra notes that while visibility cannot be eliminated, there is a balance between providing a valuable service to the community and minimising the visibility of the infrastructure. The proposed facility in Seabird will provide mobile phone services to ensure greater connectivity for regional communities, improved safety for emergency services, improved way finding for residents and tourists, and connectivity for local businesses, education services and health services. Therefore, it is considered that the above mitigation measures to reduce visual impact have been appropriately balanced with the significant benefits of the service to the community.

EME & Health

Telstra's mobile network, and many various communications networks, transmits radio signals or radiofrequency electromagnetic energy (EME) – the same kind of signal as radio and television broadcasts, which are subject to the same public health and safety standard, and have been present in the environment for generations. Wherever you can watch television or listen to the radio, a radiofrequency signal is present in your environment.

Today communities depend on radio communications for many day-to-day communications. Radio communications facilities commonly found in urban areas include television, AM and FM radio broadcast towers, paging network antennas, mobile network facilities, and many 2-way radio systems supporting emergency services, council services, hospitals, roadside assistance, taxi-services, sports clubs, transit authorities, utility providers, and large commercial operations such as shopping centres and property development sites.



Telstra understands that some people have genuine concerns about the levels of EME that facilities will emit and is committed to addressing those concerns responsibly. We rely on the expert advice of international and national health authorities including the World Health Organization (WHO) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) for overall assessments of health and safety impacts. We do want to highlight some aspects of the public health and safety standards that we hope gives you greater peace of mind.

Firstly, licensed radio frequency transmitters, including Telstra's mobile communications facilities and commercial radio and TV broadcast towers, are regulated to protect all people in all environments at all times including vulnerable members of the community (people who are ill, children and the elderly), 24- hours a day, 7- days a week. Australia has adopted the safety regulations recommended by the WHO. These regulations also have a significant safety margin, or precautionary approach built into them. We also highlight that by operating the mobile network at signal strengths significantly below that safety standard Telstra has additionally applied a precautionary approach to the operation of its network.

Secondly, we highlight that the national safety regulations protect the public by placing a limit on the strength of the signal that any licensed radio facility may transmit. They do not impose any general public distance-based restrictions. Consequently, radio facilities are found in all environments.

Thirdly, and importantly, the public health and safety standards recommended by the WHO are based on a very large body of peer-reviewed science. The WHO, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and other international safety bodies advise that the weight of evidence shows that there are no substantiated or established health effects from radio frequencies (including 4G LTE) employed within safety limits.

With regards to the proposed mobile base station in Seabird, the EME Report shows that the maximum EME level calculated for the proposed systems at this site is 0.007% of the public exposure limit. Further details about the proposed facility and its electromagnetic emission (EME) can be found on the website www.rfnsa.com.au using site number 6042001.

Property Values

The issue of property value is an extremely complex one, with fluctuations in price being subject to a vast number of factors – many of which are subjective, such as the amount of light, access to services, the condition of the house, views, amenity of the local area and the availability of services such as telecommunications. During this period of telecommunications infrastructure installation, property values across the board have continued to increase, showing no sign of deterioration as a result of specific factors such as the location of telecommunications base stations. Notwithstanding, Telstra is not aware of any credible evidence that directly links the siting of a telecommunications facility to either an increase or a decrease in property prices.

It is expected the installation of this facility will improve access to mobile and broadband services and will provide a positive benefit to the wider community. It is also noted that state government legislation prevents property values from being considered when assessing a planning application.



Department of Defence Referral

The proposed development application was referred to the Civil Aviation Safety Authority (CASA) who raised no concerns. At CASA's recommendation the proposal was referred to the Department of Defence (DoD) for comment who also raised no concerns about the proposal. However, the DoD did request that Telstra's "as constructed" details be forwarded to Air Services Australia (ASA) so that the mobile phone base station facility can be added to the database of tall structures.

Telstra will provide Air Services Australia (ASA) with the "as constructed" details of the proposal as requested by the Department of Defence once construction is complete. The details will be emailed to yod@airservicesaustralia.com as recommended.

Department of Water & Environmental Regulation (DWER)

Telstra notes the significance and importance of the Seabird Water Reserve. Given the limited scale and use of the development proposal it is not expected that there will be any negative impacts upon the aquifer below the Seabird Water Reserve. However, Telstra will comply with the appropriate conditions made to protect the Seabird Water Reserve when the development application is determined by Council.

APPENDIX 4



Australian Government
Department of Communications

COMMUNICATIONS TOWERS, RADIO TRANSMITTERS AND SAFETY

Information for communities and their parliamentary representatives

Radio transmitters—Are they safe?

Some people may have concerns about possible health effects from exposure to electromagnetic energy (EME) coming from radiocommunications transmitters on towers and elsewhere. This factsheet outlines the steps the Australian Government takes to keep Australians safe.

Exposure to radiofrequency (RF) EME has been the subject of detailed research by experts. Exposure limits are set well below the level at which adverse health effects are known to occur and include a wide safety margin to protect the public.

What is EME?

RF EME is the energy in radio waves, and is used for wireless communication. It has been in use for over 100 years. It is used to send and receive signals between communications equipment such as broadcast towers, radios and televisions, mobile phone towers and phones, radar facilities, and electrical and electronic equipment. It is also part of our natural environment.

How is EME regulated?

Two Australian Government agencies, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the Australian Communications and Media Authority (ACMA), are responsible for regulating RF EME exposure.

ARPANSA is an independent Australian Government agency charged with protecting Australians from exposure to EME. ARPANSA is responsible for advising what safe levels of EME exposure are. ARPANSA has developed a public health standard which sets limits for human exposure to RF EME. The limits are set well below the level at which adverse health effects are known to occur and include a wide safety margin to protect the public. The exposure standards take into account the many sources of RF EME present in the modern environment.

The ACMA licenses the operation of radiocommunications transmitters. Licences require transmitters to comply with the exposure limits set out in the ARPANSA standard.

How much EME comes from radio transmitters?

All transmitters must operate below ARPANSA's public exposure standard. Typically transmitters operate at a tiny percentage of the ARPANSA standard.

Is the scientific information on EME up to date?

ARPANSA maintains continual oversight of emerging research into the potential health effects of EME exposure in order to provide accurate and up-to-date advice to the Government. ARPANSA works with the World Health Organisation in researching the health effects of human exposure to EME. Should scientific evidence indicate that the current ARPANSA standard does not adequately protect the health of Australians, the Government would take immediate action to rectify the situation.



NBN wireless towers

Currently, as part of the rollout of the National Broadband Network (NBN), a number of new fixed wireless towers are being built across Australia. These are subject to the same strict EME safety limits set by ARPANSA. As such, exposure to EME should not be a concern.

People can, however, also be concerned about the appearance of towers and their visual impact in their communities. This can also be the case with other facilities, for example mobile phone base stations. Approvals for the installation of free standing telecommunications towers are subject to state, territory and local government planning laws. NBN Co is required to follow the processes for community and local government consultations set out in these laws. People with concerns about proposed NBN towers should raise their concerns during the consultation process for each tower.

Where can I find out more information?

Further information is available from the following expert bodies:

Australian Radiation Protection and Nuclear Safety Agency
www.arpansa.gov.au

Australian Communications and Media Authority
www.acma.gov.au/Citizen/Consumer-info/Rights-and-safeguards/EME-hub

World Health Organisation
www.who.int/topics/electromagnetic_fields

International Commission on Non-Ionising Radiation Protection (ICNIRP)
www.icnirp.org

You can also find out more about transmitters in your community, including EME reports and community consultation information, from the Radio Frequency National Site Archive
www.rfnsa.com.au

11.4. OPERATIONS-CONSTRUCTION

Nil

11.5. ASSETS

Nil

12. MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN

Nil

13. COUNCILLORS' OFFICIAL REPORTS

13.1 GINGIN DISTRICT HIGHSCHOOL

LOCATION: GINGIN
FILE: GOV/20-1
COUNCILLOR: KIM RULE
REPORT DATE: 20 FEBRUARY 2018

Councillor Rule expressed his concern in the student numbers within Lancelin Primary School and Gingin District High school. Due to Yanchep Secondary College facilitating higher year levels the student numbers have dropped in Lancelin and Gingin, although Kindy and Pre Primary numbers have increased this year. This drop in student numbers has affected Lancelin and Gingin's teacher resources/numbers and budgets. Councillor Rule expressed that it may be a good idea to run extra programs at Gingin District High as they have the room to facilitate this.

13.2 LOWER COAST WEIGHT WATCHERS GROUP – SOVEREIGN HILL

LOCATION: SOVEREIGN HILL
FILE: GOV/20-1
COUNCILLOR: JAN COURT
REPORT DATE: 20 FEBRUARY 2018

Councillor Court attended a community meeting in Sovereign Hill regarding lack of services. State Council had a discussion on waste concerns, due to China now not taking on as much waste. It was expressed and encouraged for people to use the Container deposit scheme.

13.3 LOWER COASTAL NEIGHBOURHOOD WATCH – OCEAN FARM

LOCATION: SOVEREIGN HILL
FILE: GOV/20-1
COUNCILLOR: FRANK JOHNSON
REPORT DATE: 20 FEBRUARY 2018

Councillor Johnson attended the Lower Coastal Neighbourhood Watch meeting in Ocean Farm. There was a discussion on the 4WD tracks.

13.4 WHEATBELT NORTH REGIONAL ROAD GROUP – 19 FEBRUARY 2018

LOCATION: MOORA
FILE: GOV/20-1
COUNCILLOR: IAN COLLARD
REPORT DATE: 20 FEBRUARY 2018

Councillor Collard attended the Wheatbelt North Regional Road Group in Moora on 19 February 2018 along with the Executive Manager Operations – Construction, Allister Butcher. There was some discussion on changing the percentage of the formula used on roads. Ken Seymour suggested to go to Canberra to meet with relevant ministers regarding increasing funds to regional roads, there will be a circular of information to all Shires regarding this matter.

14. NEW BUSINESS OF AN URGENT NATURE

Nil

15. MATTERS FOR WHICH MEETING IS TO BE CLOSED TO THE PUBLIC

RESOLUTION

Moved Councillor Peczka, seconded Councillor Elgin that Council move into a confidential session to discuss Item 15.1.

CARRIED UNANIMOUSLY

The meeting was closed to the public at 4:52pm. There were no members of the public present in the Gallery.

15.1 ACQUISITION OF LOT 361 (36) BROCKMAN STREET, GINGIN

LOCATION:	LOT 361 (36) BROCKMAN STREET, GINGIN
FILE:	A5835
AUTHOR:	LEE-ANNE BURT – GOVERNANCE OFFICER
REPORTING OFFICER:	JEREMY EDWARDS – CHIEF EXECUTIVE OFFICER
REPORT DATE:	20 FEBRUARY 2018
REFER:	NIL

Reason for Confidentiality

This Report is **CONFIDENTIAL** in accordance with:

1. Section 5.23(2) of the *Local Government Act 1995* which permits the meeting to be closed to the public for business relating to the following:

(h) such other matters as may be prescribed.

and

2. Regulation 4A of the *Local Government (Administration) Regulations 1996* which states as follows:

The determination by the local government of a price for the sale or purchase of property by the local government, and the discussion of such a matter, are matters prescribe

VOTING REQUIREMENTS – ABSOLUTE MAJORITY

RECOMMENDATION

That Council delegate power to the Chief Executive Officer to acquire the property described as Lot 361 (36) Brockman Street, Gingin for an amount not exceeding the amount as determined by Council in accordance with section 5.43(d) of the *Local Government Act 1995*.

Executive Manager Corporate and Community Services left the Chambers at 4:54pm and returned at 4:55pm.

ALTERNATIVE MOTION

Moved Councillor Johnson, seconded Councillor Court that Council:

1. Undertake consultation with adjoining property owners of Lot 361 (36) Brockman Street, Gingin with regards to the intended future purpose of this lot; and

2. Subject to no adverse comments being received delegate power to the Chief Executive Officer to acquire the property described as Lot 361 (36) Brockman Street, Gingin for an amount not exceeding the amount as determined by Council in accordance with section 5.43(d) of the *Local Government Act 1995*.

~~CARRIED UNANIMOUSLY~~
CARRIED BY ABSOLUTE MAJORITY
8-0

REASON FOR ALTERNATIVE MOTION

Council was of the view that consultation with immediately adjoining landowners was necessary prior to taking any further action with respect to the acquisition of Lot 361 (36) Brockman Street, Gingin as the proposed future use of the lot may impact on their amenity.

RESOLUTION

Moved Councillor Johnson, seconded Councillor Court that the meeting be re-opened to the public.

CARRIED UNANIMOUSLY

The meeting was re-opened to the public at 5:02pm. No members of the public returned to the Gallery.

16. CLOSURE

There being no further business, the Shire President declared the meeting closed at 5:02 pm.

The next Ordinary meeting of Council will be held in Council Chambers at the Shire of Gingin Administration Centre, 7 Brockman Street, Gingin on Tuesday, 20 March commencing at 3.00 pm.

Councillor IB Collard
Shire President
20 March 2018