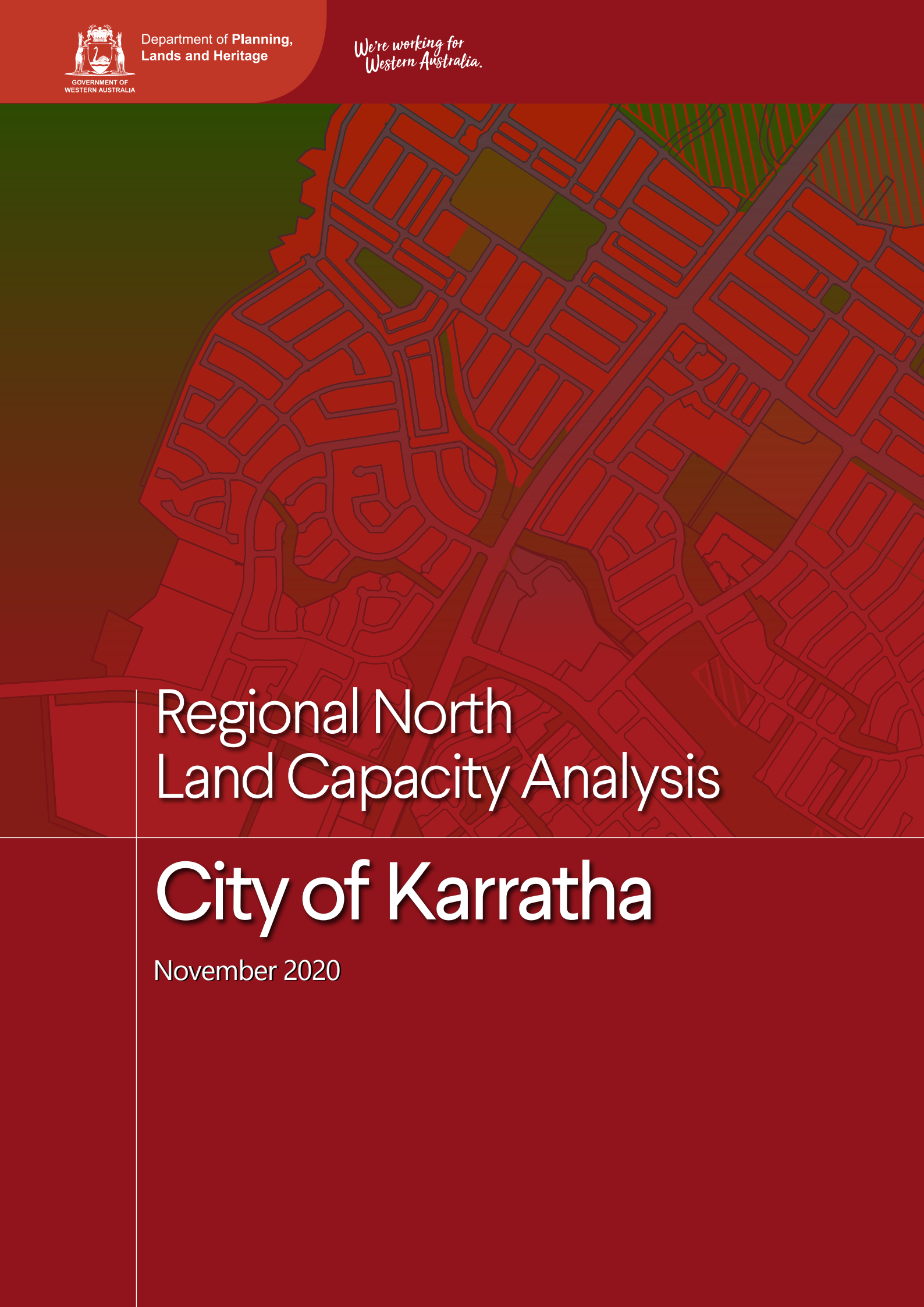




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A stylized map of the City of Karratha, showing a grid of streets and various colored areas representing different land uses or zones. The map is overlaid on a dark red background.

Regional North Land Capacity Analysis

City of Karratha

November 2020

Executive Summary

The Regional North Land Capacity Analysis provides an overview of existing and future land capacity based on forecast population growth for the settlements in the City of Karratha. In particular, it examines the land identified for residential, rural residential, commercial and industrial use that is capable of substantial further development.

This study categorises current and future land uses according to broad land-use types. The land use types are effectively a rationalisation of existing zones and reserves of the local planning scheme. The 'future' land use types have been identified through consideration of a number of strategic documents, including local planning strategies and structure plans and growth plans where relevant.

For this report the following planning instruments that have informed the settlement land-use mapping:

- City of Karratha Local Planning Scheme No.8 (2000)
- Draft City of Karratha Local Planning Strategy 2015
- Endorsed structure plans.

When these planning instruments are reviewed, it is anticipated that the land capacity analysis will be used to guide and inform their future preparation.

Ultimately this analysis establishes the potential population yield of current and future residential lands for each relevant settlement, and then considers possible implications for the local government area's land supply situation in the context of the *Western Australia Tomorrow 2031* population forecasts.

Based on the current extents of zoned residential land and land identified for future residential purposes, this analysis suggests that there is a sufficient amount of land capable of substantial further development to cater for the population growth anticipated in the *Western Australia Tomorrow 2031* population forecasts for the City of Karratha.

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The Department of Planning, Lands and Heritage acknowledges the traditional owners and custodians of this land. We pay our respect to Elders past and present, their descendants who are with us today, and those who will follow in their footsteps.

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1. Introduction

The Regional North Land Capacity Analysis provides a broad overview of the existing and future land capacity of the settlements in the City of Karratha with respect to forecast population growth. In particular, it examines land identified for residential, rural residential, commercial and industrial use that is capable of substantial further development.

This document has been prepared for discussion purposes and presents the mapping and associated analysis as it relates to the applicable settlements in the City of Karratha local government area.

Notably, the analysis suggests there is sufficient land capable of further development (based on the current extents of zoned residential land and land identified for future residential purposes) to cater for the population growth anticipated in the *Western Australia Tomorrow 2031* population forecasts for the City of Karratha.

The information presented in this document may provide a basis for a range of strategic planning including:

- assisting regional planning and providing direction for strategic infrastructure coordination;
- informing the preparation and/or review of local planning strategies, schemes and structure plans; and
- more detailed land supply analysis, such as further investigation into the infrastructure requirements to service potential development of the future land supply.

Given the dynamic nature of planning and development, it is intended that this paper will be amended periodically to reflect future updates to local planning instruments as relevant.

Notwithstanding this, the information contained in this document has been prepared for guidance purposes only.

2. Settlement land use mapping

The Department of Planning, Lands and Heritage (DPLH) has prepared mapping that captures the spatial extents of current and future land use in applicable settlements. Within the City of Karratha, this includes:

- Karratha (**Map 1**)
- Dampier (**Map 2**)
- Roebourne (**Map 3**)
- Wickham (**Map 4**)
- Point Samson (**Map 5**)

2.1 Current and future land use

For the purpose of this study, the mapping categorises current and future land uses according to broad land-use types. It effectively rationalises and consolidates existing zones and reserves of the local planning scheme, along with the intended future land uses identified in a number of strategic documents, including local planning strategies and structure plans.

The areas identified on the maps are based on general consideration of:

- current zonings and reservations within applicable local planning schemes
- other strategic planning documents including local planning strategies, structure plans, layout plans and/or growth plans where relevant.

The extent of current land uses generally reflects that of applicable existing zones and reserves in current local planning schemes; and future land uses generally reflect where land has been identified in other documents for a different (typically more intensive) land use than that identified in the current scheme.

Planning instruments that have informed the preparation of the settlement land-use mapping within the City of Karratha include the:

- City of Karratha Local Planning Scheme No. 8
- Draft City of Karratha Local Planning Strategy 2015
- Endorsed structure plans.

As a general guide, a broad description of each land-use category is provided below:

Residential	Areas that are predominantly zoned in relevant local planning schemes for residential land uses
Future residential	Areas that have been identified predominantly for future residential land uses through relevant strategic planning processes
Commercial	Areas that are predominantly zoned in relevant local planning schemes for commercial land uses
Future commercial	Areas that have been identified predominantly for future commercial land uses through relevant strategic planning processes
Industrial	Areas that are predominantly zoned in relevant local planning schemes for industrial land uses
Future industrial	Areas that have been identified predominantly for future industrial land uses through relevant strategic planning processes
Rural	Areas that are predominantly zoned in relevant local planning schemes for rural land uses
Future rural	Areas that have been identified predominantly for future rural land uses through relevant strategic planning processes
Public purposes and utilities	Areas that are predominantly reserved in relevant local planning schemes for public purposes and/or utilities
Future public purposes and utilities	Areas that have been identified predominantly for future public purposes and/or utilities through relevant strategic planning processes
Recreation	Areas that are predominantly reserved in relevant local planning schemes for recreation purposes
Future recreation	Areas that have been identified predominantly for future recreation purposes through relevant strategic planning processes
Conservation	Areas that are predominantly reserved in relevant local planning schemes for conservation purposes
Future conservation	Areas that have been identified predominantly for future conservation purposes through relevant strategic planning processes
Railway	Areas that are reserved in the relevant local planning schemes for the purpose of railway.
Investigation area	Areas that have been identified through relevant strategic planning processes where alternative future land uses may be considered subject to further investigation. This may include areas from plans in preparation or in draft form

2.2 Development status

To gain a general understanding of the potential capacity of zoned and potential future-zoned land within each settlement, a broad assessment has been undertaken of the development status of applicable land identified for **residential, commercial and industrial**, purposes. Generally, the assessment has involved a visual interpretation of aerial photography and cadastral information.

This assessment has been undertaken for those settlements where the applicable land uses exist within the extents mapped.

Applicable areas within the map extents have been assessed and considered as being ‘developed’ or ‘capable of substantial further development’ as described below.

Developed: land broadly considered as being where development exists or where the necessary infrastructure and services to accommodate development exist. Subdivision is generally consistent with its zoning, however existing urban areas that could potentially accommodate increases in density through urban infill are considered to be ‘developed.’

Capable of substantial further development: land ‘capable of substantial further development’ consists of undeveloped or underdeveloped land on greenfield sites, where subdivision reflective of its zoning is yet to exist. In some instances however, land may have conditional subdivision approval or be part of a broader structure planning process that still needs to be finalised. It is important to note that the development of areas that are currently considered to be capable of substantial further development may be subject to a number of constraints; including scheme amendments, structure planning, infrastructure provision, environmental and heritage issues.

Table 1 summarises the development status of each applicable land-use category for all relevant settlements, representing a set of total figures for the entire local government area. It consolidates **tables 2, 3, 4, 5** and **6**, which summarises the development status of each applicable land-use category for the individual settlements.

Table 1: City of Karratha – development status of land in relevant settlements

	Total (ha)	Developed (ha)	Capable of substantial further development (ha)
Residential	1,297	648	649
Future Residential	822	0	822
Residential and Future Residential	2,119	648	1,471
Rural Residential	1,041	0	1,041
Future Rural Residential	0	0	0
Rural and Future Rural Residential	1,041	0	1,041
Commercial	173	98	75
Future Commercial	45	0	45
Commercial and Future Commercial	218	98	120
Industrial	2,954	453	2,501
Future Industrial	1,272	0	1,272
Industrial and Future Industrial	4,226	453	3,773

Table 2: Karratha – development status of land

	Total (ha)	Developed (ha)	Capable of substantial further development (ha)
Residential	837	466	371
Future Residential	764	0	764
Residential and Future Residential	1,601	466	1,135
Rural Residential	1,041	0	1,041
Future Rural Residential	0	0	0
Rural and Future Rural Residential	1,041	0	1,041
Commercial	77	46	31
Future Commercial	34	0	34
Commercial and Future Commercial	111	46	65
Industrial	624	362	262
Future Industrial	1,238	0	1,238
Industrial and Future Industrial	1,862	362	1,500

Table 3: Dampier – development status of land

	Total (ha)	Developed (ha)	Capable of substantial further development (ha)
Residential	103	77	26
Future Residential	22	0	22
Residential and Future Residential	125	77	48
Commercial	19	11	8
Future Commercial	0	0	0
Commercial and Future Commercial	19	11	8
Industrial	2,301	85	2,216
Future Industrial	0	0	0
Industrial and Future Industrial	2,301	85	2,216

Table 5: Wickham – development status of land

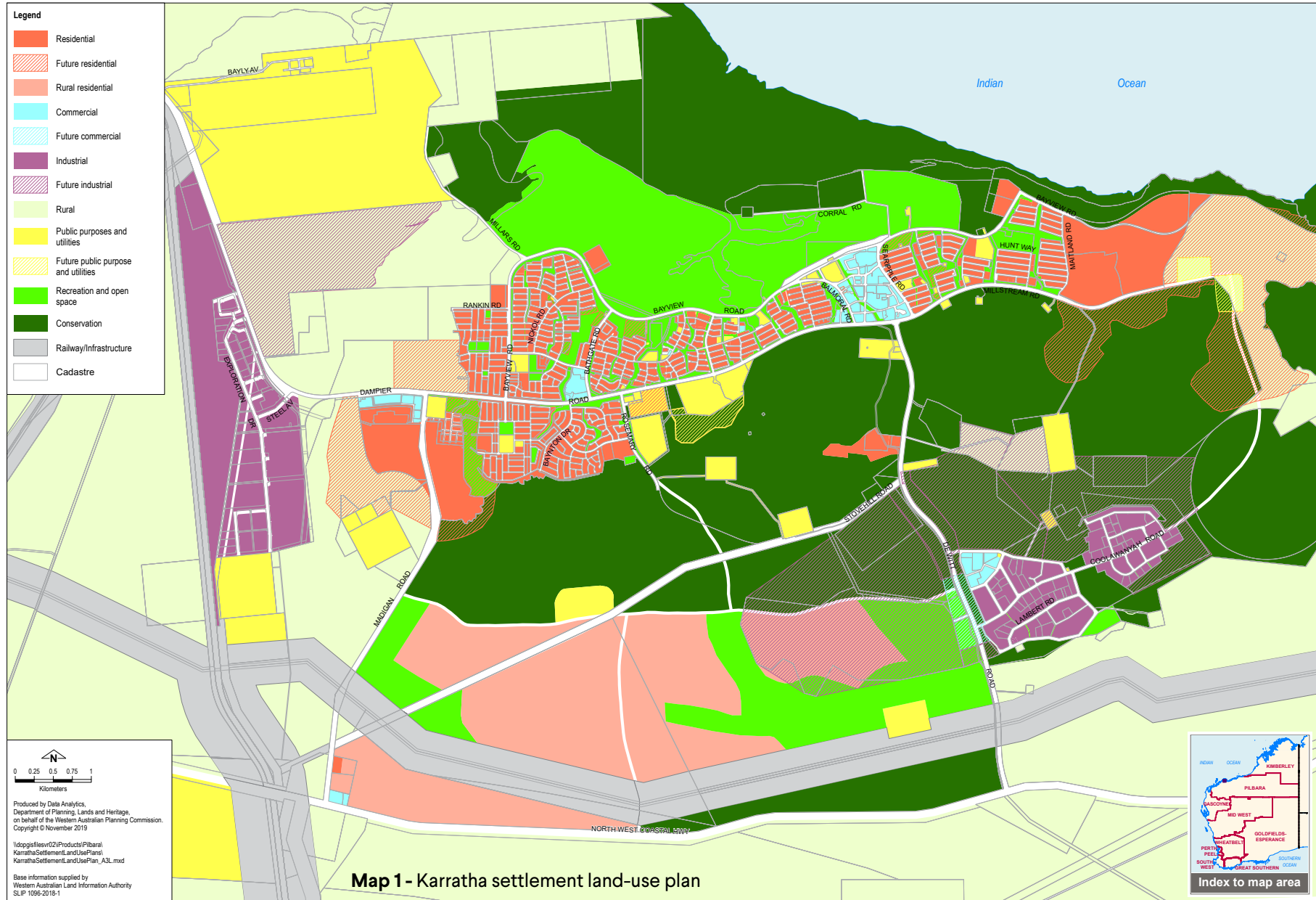
	Total (ha)	Developed (ha)	Capable of substantial further development (ha)
Residential	156	54	102
Future Residential	10	0	10
Residential and Future Residential	166	54	112
Commercial	49	18	31
Future Commercial	0	0	0
Commercial and Future Commercial	49	18	31
Industrial	8	2	6
Future Industrial	20	0	20
Industrial and Future Industrial	28	2	26

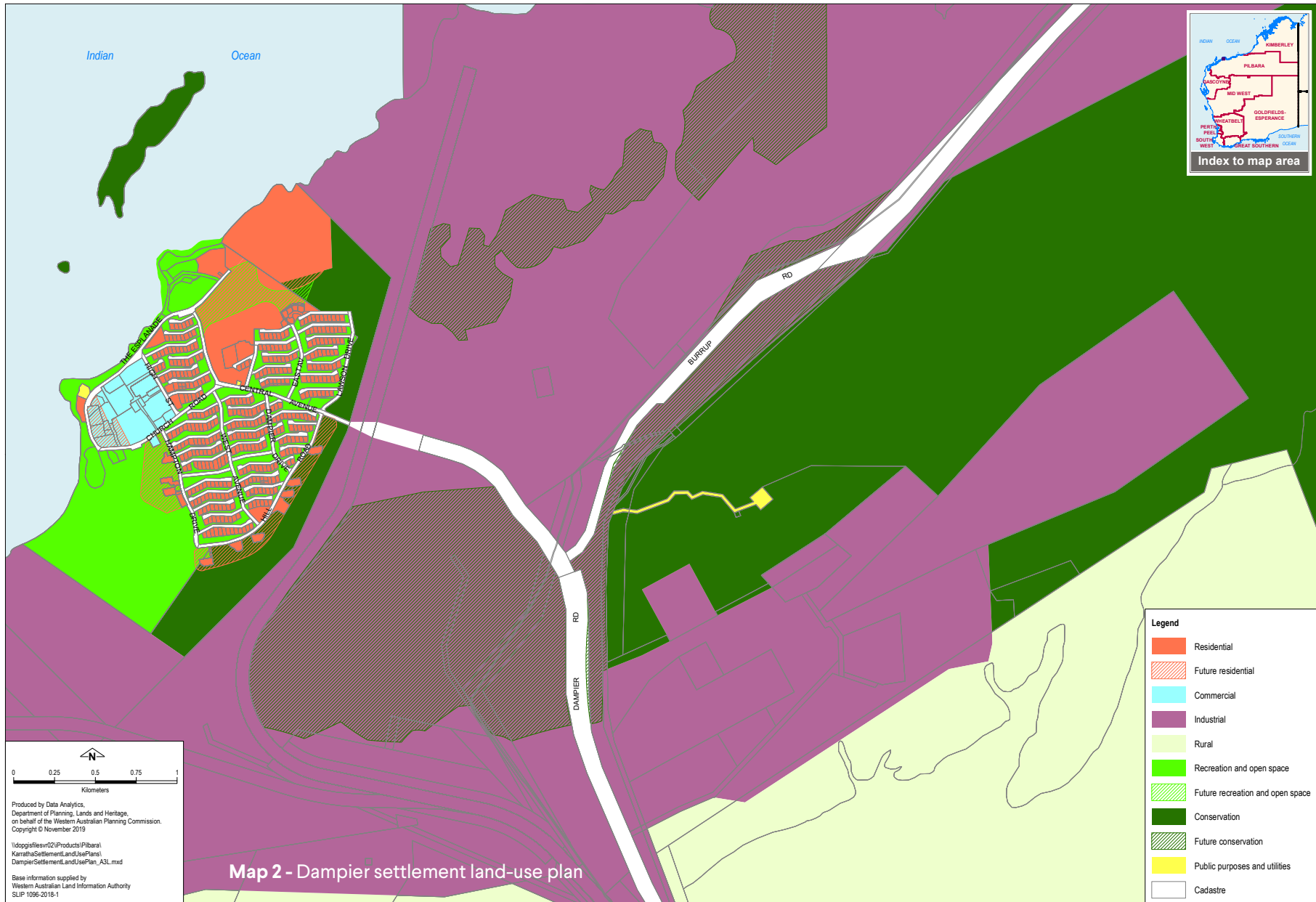
Table 4: Roebourne – development status of land

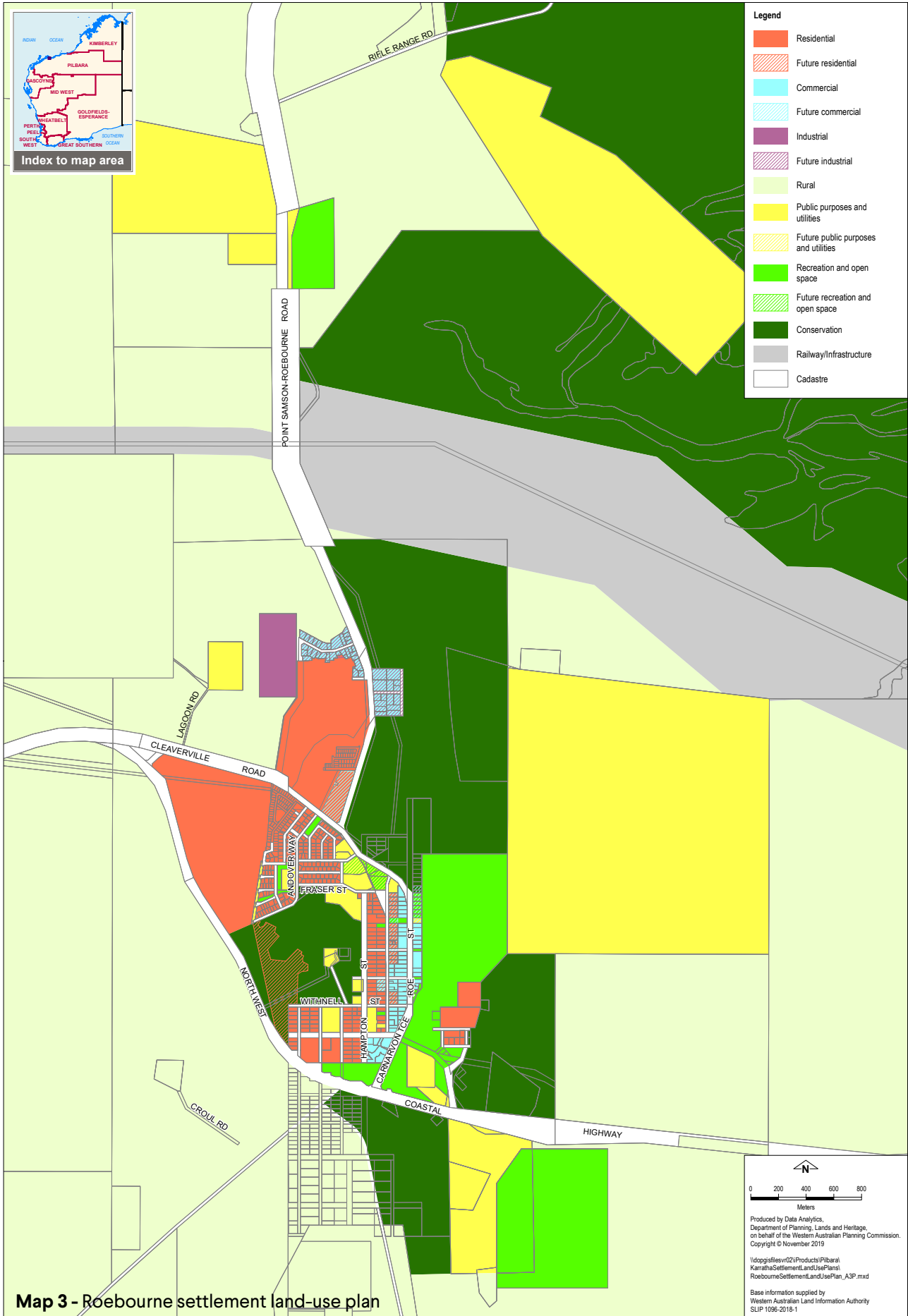
	Total (ha)	Developed (ha)	Capable of substantial further development (ha)
Residential	178	35	143
Future Residential	0	0	0
Residential and Future Residential	178	35	143
Commercial	27	22	5
Future Commercial	10	0	10
Commercial and Future Commercial	37	22	15
Industrial	16	0	16
Future Industrial	14	0	14
Industrial and Future Industrial	30	0	30

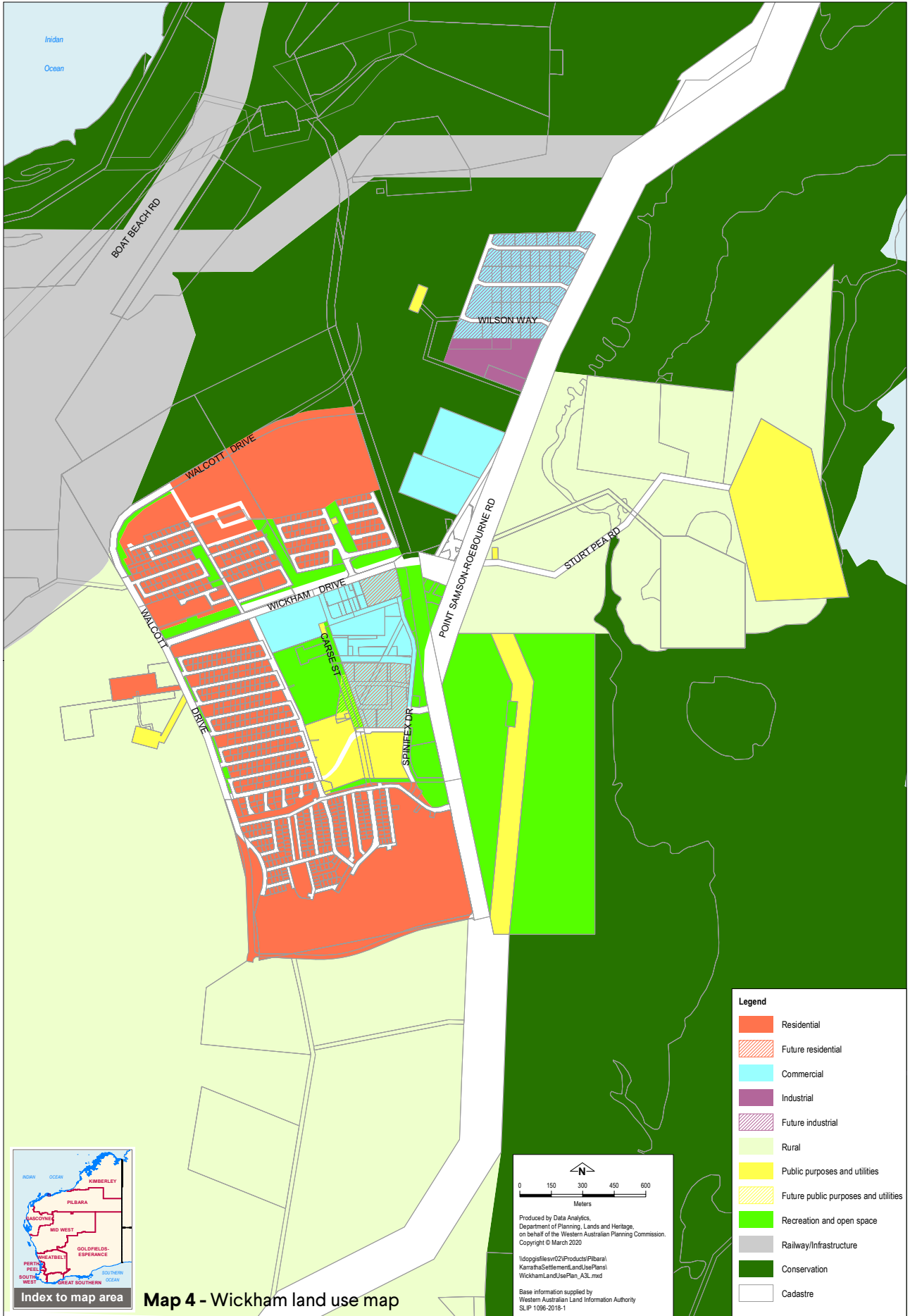
Table 6: Point Samson – development status of land

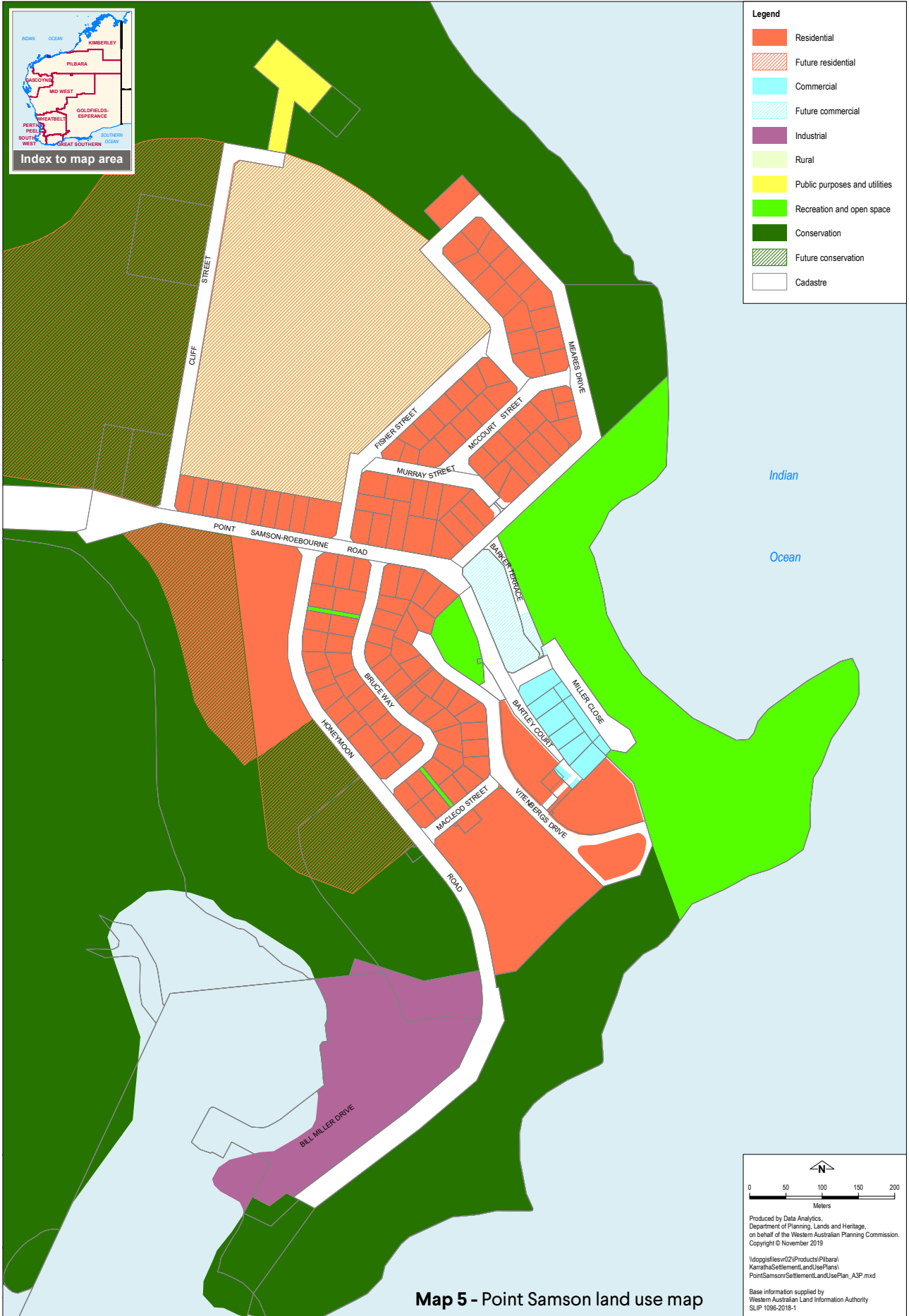
	Total (ha)	Developed (ha)	Capable of substantial further development (ha)
Residential	23	16	7
Future Residential	27	0	27
Residential and Future Residential	50	16	34
Commercial	1	1	0
Future Commercial	1	0	1
Commercial and Future Commercial	2	1	1
Industrial	5	4	1
Future Industrial	0	0	0
Industrial and Future Industrial	5	4	1











3. Capacity analysis

The assessment of the development status of current and future land use areas enables a broad-level capacity analysis of the residential development potential of land within the City of Karratha. The Department of Planning, Lands and Heritage has prepared such an analysis that:

- estimates the potential additional population yield of current and future residential lands for each relevant settlement
- considers possible implications for the local government area's land supply situation in the context of the *Western Australia Tomorrow 2031* population forecasts.

Tables in section 3.1 summarise the estimated additional capacity of residential land for the relevant settlements within the City of Karratha. Further analysis is presented in section 3.2 that relates this information to *Western Australia Tomorrow 2031* population forecasts.

When considering the outputs of the analysis, it is important to note that additional capacity is assumed to be accommodated exclusively in areas that are identified as being capable of substantial further development. This means that the estimates generally do not account for possible land capacity increases due to infill and/or redevelopment of existing developed areas, and from this perspective are considered broad in nature and likely underestimate the potential overall capacity.

A capacity analysis for commercial and industrial lands necessarily requires assumptions to be made on employment density. There are currently limitations in the available data required in order to make reasonable assumptions in this regard. In particular, relatively small statistical sample sizes – something that is prevalent in regional and remote areas – compromise the reliability of using the available data for such an application. It is considered that further investigation is required to ascertain representative rates of employment density for commercial and industrial lands in regional areas, and accordingly such an analysis is not included in this paper at this stage.

3.1 Potential capacity of residential and rural residential lands

For **residential** and **rural residential** land use, potential capacity has been calculated according to scenarios that assume different average development densities that are applicable to each of those land uses. Potential additional lot and population yields have been estimated for each respective current and future land use category as they relate to each relevant settlement in the City of Karratha.

Table 7 presents the total potential additional lot and population yields for all relevant settlements across the local government area.

Tables 8, 9, 10, 11 and **12** present the potential additional lot and population yields for individual settlements relevant to this analysis.

(Note: **Table 7** consolidates all data from **tables 8, 9, 10, 11** and **12**, and represents a set of total figures for the entire local government area.)

Table 7: City of Karratha – estimated capacity of residential and rural residential deemed capable of substantial further development

Estimated capacity of residential, rural residential and rural smallholdings lands deemed capable of substantial further development				Estimated potential population yield from additional lots ²
Relevant land-use category	Area (ha)	Average density / average lot size	Potential lot yield ¹	
Residential	658	R10	4,277	11,976
		R20	8,554	23,951
		R30	12,831	35,927
Future Residential	822	R10	5,346	14,969
		R20	10,692	29,938
		R30	16,039	44,909
Residential and Future Residential	1,480	R10	9,623	26,945
		R20	19,246	53,889
		R30	28,870	80,836
Rural Residential	1,041	1 ha	781	2,187
		2 ha	390	1,092
		4 ha	195	546
Future Rural Residential	0	1 ha	0	0
		2 ha	0	0
		4 ha	0	0
Rural Residential and Future Rural Residential	1,041	1 ha	781	2,187
		2 ha	390	1,092
		4 ha	195	546

¹ For residential land, the 35 per cent of land necessary to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) has been factored into these figures.

² The population yield per dwelling is calculated at 2.8 people per dwelling unit (Average people per household for the Karratha LGA)

Table 8: Karratha – estimated capacity of residential and rural residential lands deemed capable of substantial further development

Estimated capacity of residential, rural residential and rural smallholdings lands deemed capable of substantial further development				Estimated potential population yield from additional lots ²
Relevant land-use category	Area (ha)	Average density / average lot size	Potential lot yield ¹	
Residential	371	R10	2,412	6,754
		R20	4,823	13,504
		R30	7,235	20,258
Future Residential	764	R10	4,963	13,896
		R20	9,926	27,793
		R30	14,888	41,686
Residential and Future Residential	1,135	R10	7,375	20,650
		R20	14,749	41,297
		R30	22,123	61,944
Rural Residential	1,041	1 ha	781	2,187
		2 ha	390	1,092
		4 ha	195	546
Future Rural Residential	0	1 ha	0	0
		2 ha	0	0
		4 ha	0	0
Rural Residential and Future Rural Residential	1,041	1 ha	781	2,187
		2 ha	390	1,092
		4 ha	195	546

¹ For residential land, the 35 per cent of land necessary to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) has been factored into these figures.

² The population yield per dwelling is calculated at 2.8 people per dwelling unit (Average people per household for the Karratha LGA)

Table 9: Dampier – estimated capacity of residential lands deemed capable of substantial further development

Estimated capacity of residential, rural residential and rural smallholdings lands deemed capable of substantial further development				Estimated potential population yield from additional lots ²
Relevant land-use category	Area (ha)	Average density / average lot size	Potential lot yield ¹	
Residential	26	R10	169	473
		R20	338	946
		R30	507	1,420
Future Residential	22	R10	142	398
		R20	284	795
		R30	427	1,196
Residential and Future Residential	48	R10	311	871
		R20	622	1,741
		R30	934	2,616

¹ For residential land, the 35 per cent of land necessary to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) has been factored into these figures.

² The population yield per dwelling is calculated at 2.8 people per dwelling unit (Average people per household for the Karratha LGA)

Table 10: Roebourne – estimated capacity of residential land deemed capable of substantial further development

Estimated capacity of residential, rural residential and rural smallholdings lands deemed capable of substantial further development				Estimated potential population yield from additional lots ²
Relevant land-use category	Area (ha)	Average density / average lot size	Potential lot yield ¹	
Residential	143	R10	930	2,604
		R20	1,859	5,205
		R30	2,789	7,809
Future Residential	0	R10	0	0
		R20	0	0
		R30	0	0
Residential and Future Residential	143	R10	930	2,604
		R20	1,859	5,205
		R30	2,789	7,809

¹ For residential land, the 35 per cent of land necessary to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) has been factored into these figures.

² The population yield per dwelling is calculated at 2.8 people per dwelling unit (Average people per household for the Karratha LGA)

Table 11: Wickham – estimated capacity of residential land deemed capable of substantial further development

Estimated capacity of residential, rural residential and rural smallholdings lands deemed capable of substantial further development				Estimated potential population yield from additional lots ²
Relevant land-use category	Area (ha)	Average density / average lot size	Potential lot yield ¹	
Residential	111	R10	722	2,022
		R20	1,443	4,040
		R30	2,165	6,062
Future Residential	10	R10	68	190
		R20	135	378
		R30	203	568
Residential and Future Residential	121	R10	790	2,212
		R20	1,578	4,418
		R30	2,368	6,630

¹ For residential land, the 35 per cent of land necessary to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) has been factored into these figures.

² The population yield per dwelling is calculated at 2.8 people per dwelling unit (Average people per household for the Karratha LGA)

Table 12: Point Samson – estimated capacity of residential land deemed capable of substantial further development

Estimated capacity of residential, rural residential and rural smallholdings lands deemed capable of substantial further development				Estimated potential population yield from additional lots ²
Relevant land-use category	Area (ha)	Average density / average lot size	Potential lot yield ¹	
Residential	7	R10	46	129
		R20	91	255
		R30	137	384
Future Residential	27	R10	174	487
		R20	347	972
		R30	521	1,459
Residential and Future Residential	34	R10	220	616
		R20	438	1,227
		R30	658	1,843

¹ For residential land, the 35 per cent of land necessary to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) has been factored into these figures.

² The population yield per dwelling is calculated at 2.8 people per dwelling unit (Average people per household for the Karratha LGA)

Based on the potential population yield calculations in **Table 7**, estimated total population figures for the City of Karratha are provided for low, medium and high-density development scenarios as presented in **Table 13**. Within each scenario, two subsets are considered:

- **'A'** considers the potential additional population yield of all residential, rural residential and rural smallholdings land capable of further development at the average density or lot sizes attributable to that particular scenario; and
- **'B'** considers the potential additional population yield of all residential, future residential, rural residential, future rural residential, rural smallholdings and future rural smallholdings land capable of further development at the average density or lot sizes attributable to that particular scenario.

These figures assume that all additional population in the local government area is accommodated on residential, rural residential and rural smallholdings lands deemed capable of substantial further development within the settlements considered.

Table 13: City of Karratha – estimated potential population capacity

Scenario ¹ (average density of residential land / average lot size of rural residential land / average lot size for rural smallholdings land)		Current population ²	Estimated potential population yield from additional lots ³	Estimated total population ⁴
1. Low-density scenario (R10 / 4 ha / 40 ha)	1A	22,414	12,522	34,936
	1B	22,414	27,491	49,905
2. Medium-density scenario (R20 / 2 ha / 20 ha)	2A	22,414	25,043	47,457
	2B	22,414	54,981	77,395
3. High-density scenario (R30 / 1 ha / 8 ha)	3A	22,414	38,114	60,528
	3B	22,414	83,023	105,437

¹ Scenarios consider the estimated potential population capacity of the City of Karratha through estimating the potential additional population capacity of land within all relevant settlements with a residential land use that has been deemed capable of substantial further development.

² City of Karratha Local Government Area, 2018 Preliminary Estimated Residential Population (Australian Bureau of Statistics, 3218.0 – Regional Population Growth 2016-17).

³ As per the relevant assumptions as described for **Table 7**.

⁴ The 'estimated total population' is the sum of the 'current population' and the 'estimated potential population yield from additional lots' columns.

3.2 Comparison of potential capacity estimates with the *Western Australia Tomorrow 2031* population forecasts

Western Australia Tomorrow (Western Australian Planning Commission, 2018) contains population forecasts produced by the State Demographer and are considered to be the State's official population forecasts.

Table 14 presents the *Western Australia Tomorrow 2031* population forecasts for the City of Karratha.

The figures in the 'additional population' column are the difference between the 2031 forecast population and the Australian Bureau of Statistics 2017 Preliminary Estimated Residential Population for the City of Karratha (22,414).

Significantly, these forecasts provide a point of comparison for interpreting the potential capacities of residential land as determined through this analysis.

For further information on these forecasts, please refer to: www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts

Table 14: City of Karratha – *Western Australia Tomorrow 2031* population forecasts (WAPC, 2018)

WA Tomorrow forecast bands	2031 forecast population	Additional population
WA Tomorrow – Band A	22,015	-399
WA Tomorrow – Band B	23,310	896
WA Tomorrow – Band C	23,890	1,476
WA Tomorrow – Band D	24,635	2,221
WA Tomorrow – Band E	26,045	3,631

3.2.1 Estimated additional residential land requirements to accommodate population forecasts

Table 15 presents estimates for the amount of residential land that would be required to accommodate the additional population for each of the population forecasts. Estimates are presented according to three different average densities of residential development, being R10, R20 and R30.

These estimates are compared to the total of all current residential and future residential land identified in the relevant City of Karratha settlements as being capable of substantial further development. The figures under the 'surplus' column indicate the magnitude of the potential surplus of residential land from the extents currently identified once the additional forecast population has been allowed for. A negative figure in this column indicates a shortfall in the identified areas of residential lands relating to that required to accommodate the additional population from the relevant forecasts.

The estimates in **Table 15** assume:

- all population growth occurs on residential and future residential land that has been identified as being capable of substantial future development in this analysis. To keep the calculations relatively straightforward, they do not consider additional population being accommodated on rural residential or rural smallholdings lands, nor do they take into account potential increases in population occurring due to infill development. They therefore likely overestimate residential land requirements;
- a 35 per cent allowance from gross land areas for various requirements to support development (e.g. public open space, streets, other infrastructure); and
- the number of people per dwelling remains constant.

Based on the current extents of zoned residential land and land identified for future residential purposes, this analysis suggests that there is a sufficient amount of land capable of substantial further development to cater for the population growth anticipated in the *Western Australia Tomorrow 2031* population forecasts for the City of Karratha.

Please note, this component of the analysis only considers the local government as a whole rather than each individual settlement. This is mainly due to the alignment of available data inputs at this geographic scale.

Table 15: City of Karratha – estimated additional residential land requirements to accommodate population forecasts

WA Tomorrow forecast bands	Additional population	Current and future land capable of substantial further development (ha) ²	Residential ¹					
			R10 average density		R20 average density		R30 average density	
			Estimated land required to accommodate additional population (ha) ³	Surplus (ha) ⁴	Estimated land required to accommodate additional population (ha) ³	Surplus (ha) ⁴	Estimated land required to accommodate additional population (ha) ³	Surplus (ha) ⁴
WA Tomorrow – Band A	-399	1,480	0	1,502	0	1,491	0	1,488
WA Tomorrow – Band B	896	1,480	49	1,431	25	1,456	16	1,464
WA Tomorrow – Band C	1,476	1,480	81	1,399	41	1,440	27	1,453
WA Tomorrow – Band D	2,221	1,480	122	1,358	61	1,419	41	1,440
WA Tomorrow – Band E	3,631	1,480	200	1,281	100	1,381	67	1,414

¹ These estimates assume that all population growth occurs on residential and future residential land that has been identified as being capable of substantial future development in this analysis. To keep the calculations relatively straightforward, they do not consider additional population being accommodated on rural residential or rural smallholdings lands, nor do they take into account potential increases in population occurring due to infill development. They therefore likely overestimate residential land requirements.

² Total area of current and future residential lands capable of substantial further development for entire local government area.

³ A 35 per cent allowance from gross land areas to support land requirements for public open space and streets (*Liveable Neighbourhoods*, 2007) and a population yield per dwelling of 2.8 people per dwelling unit (average people per household for the Average people per household for the Karratha LGA) have been factored into the estimated areas of residential land required to accommodate forecast additional populations.

⁴ A positive figure in this column indicates that the additional population under the relevant population forecast should be able to be accommodated within the areas of residential and future residential land currently identified, without additional residential land being required. A negative figure represents the shortfall in the identified areas of residential lands with respect to that required to accommodate the additional population.