



ALKIMOS COASTAL VILLAGE LOCAL STRUCTURE PLAN

December 2019





ALKIMOS COASTAL VILLAGE LSP NO. 101

DECEMBER 2019

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DOCUMENT STATUS

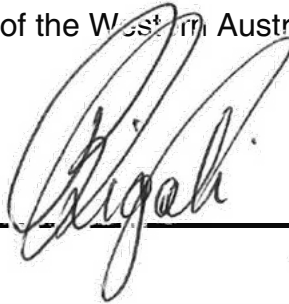
VERSION	COMMENT	PREPARED BY	REVIEWED BY	REVIEW DATE	APPROVED BY	ISSUE DATE
Revision 0		CD+P	KB	141208	FA	141208
Revision 1		CD+P	KB	150306	FA	150306
Revision 2		CD+P	KB	150320	FA	150320
Revision 3		CD+P	KB	160315	FA	160317
Revision 4	Schedule of Modifications	CD+P	KB	191107	FA	191212

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This structure plan is prepared under the provisions of the City of Wanneroo District Planning Scheme No.2

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON: 7 August 2020

Signed for and on behalf of the Western Australia Planning Commission:



An officer of the Commission duly authorized by the Commission pursuant to section 16 of the *Planning and Development Act 2005* for that purpose, in the presence of:



Witness

7 August 2020 Date

7 August 2030 Date of Expiry

Table 1: Table of Amendments

AMENDMENT NO.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC

Table 2: Table of Density Plans

DENSITY PLAN NO.	AREA OF DENSITY PLAN APPLICATION	DATE ENDORSED BY WAPC



EXECUTIVE SUMMARY

The *Alkimos Coastal Village Local Structure Plan* has been prepared to guide the subdivision and development of some 86 hectares of land on portion of Lots 9001, 9004, 9045 and 1000, Alkimos within the City of Wanneroo. It will create a framework to facilitate a vibrant and connected regional beach destination, and deliver unprecedented densities and mixed use development within the north-west corridor of the Perth Metropolitan Region.

The design approach has been a rigorous multidisciplinary process with continual reflection upon the key project vision:

The Alkimos Coastal Village will be a vibrant destination, connecting the greater Alkimos community to its regional beach. The natural characteristics of the coastal village surrounds will create an unsurpassed coastal experience unique to Alkimos. The foreshore will be an energetic and lively place with a distinct coastal flavour. This is to be complemented by a specialised retail and entertainment precinct that serves both visitors and residents alike, within easy reach to both the immediate community and the wider region. Higher density built form will identify and complement the foreshore strip ensuring the activation of this family friendly and community focused location.

A summary of the key statistics and planning outcomes of the Alkimos Coastal Village Local Structure Plan is provided in the Executive Summary Table.

ITEM	DATA	STRUCTURE PLAN REFERENCE (SECTION NO.)
Total area covered by the structure plan	86 hectares	1.2.2
Area of each land use proposed:		
- Residential	19.25 hectares	7.3
- Mixed Use	3.19 hectares	
- Industrial	0 hectares	
- Commercial	3.36 hectares	
Total estimated lot yield	646 lots	7.4
Estimated number of dwellings	2,222 dwellings	7.4
Estimated residential site density	98 dwellings per site hectare	7.4
Estimated population	6,103 people	7.6
Number of high schools	0 high schools	-
Number of primary schools	0 primary schools	-
Estimated commercial floor space	23,000m ² net GFA	7.6
Employment self-sufficiency targets	jobs ÷ workers = 33.3%	7.6
Estimated area of public open space:		
- Regional open space	21.74 hectares	7.8
- District open space	0 hectares	
- Neighbourhood parks	0.55 hectares; 1 park	
- Local parks	5.99 hectares; 7 parks	
Estimated number and area of natural area and biodiversity assets (conservation POS)	2.097 hectares (2 sites)	7.8



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ABBREVIATIONS

ACVLSP	Alkimos Coastal Village Local Structure Plan
AEDSP	Alkimos Eglinton District Structure Plan
AHG	Australian Height Datum
ASS	Acid Sulfate Soils
AS	Australian Standard
CBD	Central Business District
CPTED	Crime Prevention Through Environmental Design
DA	Development Area
DCA	Development Control Area
DCP	Development Control Policy
DBCA	Department of Biodiversity, Conservation and Attractions
DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environment Regulation
EPA	Environmental Protection Authority
FMP	Foreshore Management Plan
Ha	Hectare
HV	High Voltage
Km	kilometre
kV	kilovolt
LDP	Local Development Plan
LWMS	Local Water Management Strategy
MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
MRS	Metropolitan Region Scheme
MSL	Mean Sea Level
MVA	Megavolt Ampere
NatHERS	Nationwide House Energy Rating Scheme
NFA	Net Floor Area
POS	Public Open Space
PSP	Primary Shared Path
R-AC Code	Residential Activity Centre Code
STS	Secondary Transit System
TMP	Traffic Management Plan
UWMP	Urban Water Management Plan
WC	Water Corporation
WAPC	Western Australian Planning Commission
WAWA	Water Authority of Western Australia
WSUD	Water Sensitive Urban Design
ZS	Zone Substation





PART ONE

Implementation

alkimos coastal village structure plan

1. Structure Plan Area
2. Operation
3. Staging
4. Subdivision and Development Requirements
5. Local Development Plans
6. Other Requirements
7. Additional Information

Plan 1 Alkimos Coastal Village Local Structure Plan

Table 1 Subdivision and Development Requirements for Structure Plan Area

Table 2 Centre Floor Space Allocations

Table 3 Additional Information

ALKIMOS COASTAL VILLAGE STRUCTURE PLAN – PART ONE IMPLEMENTATION

Plan 1	Alkimos Coastal Village Local Structure Plan
Table 1	Subdivision and Development Requirements for Structure Plan Area
Table 2	Centre Floor Space Allocations
Table 3	Additional Information

1 STRUCTURE PLAN AREA

This Part applies to the Alkimos Coastal Village Structure Plan, being a portion of Lots 9001, 9004, 9045 and 1000 and consisting of all land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map (**Plan 1**).

2 OPERATION

The date the Structure Plan comes into effect is the date the Structure Plan is approved by the Western Australian Planning Commission (WAPC).

3 STAGING

The development of the Structure Plan area will be implemented in stages based on the following triggers:

- Market demands influencing number of lots being released at any stage; and
- The extent of the adjoining development front, availability of services through adjoining developments.

4 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

Plan 1 and Tables 1 – 3 prescribe the standards, requirements and prerequisites for subdivision and development in the corresponding precincts designated on the Structure Plan Map.

Prior to any subdivision or development being supported, the City will require:

- a) The preparation and approval of the reports, surveys, strategies and plans listed in Table 3 at the stage specified in that table; and
- b) A report accompanying any application for subdivision or development that outlines the manner in which the findings and recommendations of the plans and strategies listed in Table 3 and appended to this Structure Plan will be incorporated into or addressed by the proposed subdivision or development.

LEGEND

--- Structure Plan Boundary

ZONES

- Commercial
- Residential
- Mixed Use

RESERVES

- Parks and Recreation
- Public Purpose (Subject to Further Planning)

MOVEMENT

- Neighbourhood Connector
- Coastal Road
- Secondary Transit System (STS Route)
- Pedestrian and Cyclist Route
- Regional Foreshore Shared Path
- Public Open Space (Indicative Location)
- Coastal Foreshore (area where values, uses, functions and assets can be located at the end of the planning timeframe)

OTHER

- R-Codes Residential Density
- Areas Subject to Future MRS Amendment
- Indicative Surf Lifesaving Club
- 100 Year Coastal Process Line (as per digital data from MP Rogers)

INDICATIVE FUTURE PROPOSED AMENDMENTS TO THE MRS

- ① To rezone from MRS 'Urban' Zone to 'Public Purpose' Reserve.
- ② To rezone from MRS 'Urban' Zone to 'Parks and Recreation' Reserve.



PLAN 1 - ALKIMOS COASTAL VILLAGE LOCAL STRUCTURE PLAN

Scale 1:2500 @ A1 1:5000 @ A3	
DATE: 22/01/2016	DRAFTER: RF
REVISED: 30/05/2019	PLANNER: KB
PRODUCTION: PCG-94	CHECK: CM
DATUM: AHD	PLAN NUMBER: LCPAC-2-007

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Table 1 – Subdivision and Development Requirements for Structure Plan Area

1. Structure Plan Map	1.1 Subdivision and development of land is to be in accordance with the Structure Plan Map.
2. Use Class Permissibility	2.1 Land use permissibility within the Structure Plan area is to be in accordance with the corresponding zone or reserve under the Scheme.
3. Residential Density	<p>3.1 The Structure Plan Map defines broad residential density ranges that apply to specific areas within the Structure Plan. Lot specific residential densities, within the defined residential density ranges, are to be subsequently assigned in accordance with a Residential Density Code Plan approved by the WAPC.</p> <p>3.2 A Residential Density Code Plan is to be submitted at the time of subdivision to the WAPC and shall indicate the Residential Density Coding applicable to each lot within the subdivision and shall be consistent with the Structure Plan Map and the locational criteria contained in Clause 3.6.</p> <p>3.3 The Residential Density Code Plan is to include a summary of the proposed dwelling yield of the subdivision and demonstrate how the dwelling target within the structure plan is progressively being met.</p> <p>3.4 Approval of the Residential Density Code Plan shall be undertaken at the time of determination of the subdivision application by the WAPC. The approved Residential Density Code Plan shall then form part of the Structure Plan and shall be used for the determination of future development applications. Variations to the Residential Density Code Plan will require further approval of the WAPC.</p> <p>3.5 Residential Density Code Plans are not required if the Structure Plan Map allocates a specific density coding, i.e. not a residential density range for the subdivision area; or if the WAPC considers that the subdivision is for one or more of the following:</p> <ul style="list-style-type: none"> a) The amalgamation of lots or part lots; b) The consolidation of land for 'superlot' purposes to facilitate land assembly for future development; c) The purpose of facilitating the provision of access, services or infrastructure; and d) Land which by virtue of its zoning or reservation cannot be developed for residential purposes. <p>3.6 The allocation of residential densities on the Residential Density Code Plan shall be in accordance with the following criteria:</p> <ul style="list-style-type: none"> a) R25 – R40 <ul style="list-style-type: none"> i) A base density code of R25 is applicable for all residential lots within this range, particularly where needed to allow for landform and vegetation protection/retention and in locations adjacent to the Alkimos Waste Water Treatment Plant. ii) Density coding of R40 applies where: <ul style="list-style-type: none"> - within 200 metres of the Coastal Activity Centre - adjacent to the Secondary Transit System (STS) Route; or - adjacent to public open space. b) Residential densities elsewhere within the Structure Plan area shall be in accordance with the densities as identified on the Structure Plan Map.

	3.7	Where permitted under the residential density, the provisions of the Residential Design Medium Density Codes apply to lots within the Structure Plan area.
4. Dwelling Targets	4.1	A minimum of 1,061 dwellings are to be provided within the Structure Plan area
5. Building Heights	5.1	Maximum building heights are to be in accordance with the requirements of the Residential Design Codes, unless otherwise provided for in a Local Development Plan.
6. Public Open Space	6.1	A minimum of 5% public open space of the gross subdivisible area is to be provided subject to the requirements of <i>Liveable Neighbourhoods</i> being met to the satisfaction of the City of Wanneroo and the WAPC. Public Open Space is to be provided generally in accordance with the Structure Plan Map and the Public Open Space Schedule included in Part Two, with an updated Public Open Space Schedule to be provided at the time of subdivision for determination by the WAPC, upon the advice of the City of Wanneroo.
7. Road Connections	7.1	Arrangements are to be made to the satisfaction of the Western Australian Planning Commission for the construction of the neighbourhood connector traversing northeast through the MRS Parks and Recreation reserve as part of the subdivision application process.
8. Development within Coastal Activity Centre	8.1	Development within the coastal activity centre (land identified for Commercial and Mixed Use on the Structure Plan Map) is to have regard to the guidance provided within Part Two relating to built form.

5 LOCAL DEVELOPMENT PLANS (LDP)

- a) Local Development Plans shall be required, where applicable, as a condition of subdivision and shall be prepared in accordance with the Scheme, for:
- i) land identified for Commercial and Mixed Use on the Structure Plan Map;
 - ii) lot with direct boundary frontage (primary or secondary) to any area of Public Open Space; and
 - iii) any other lot that requires specific development standards, as required by the City or the WAPC.
- b) In addition to any general matters required to be included within a Local Development Plan under the Scheme, Local Development Plans are to address:
- i) built form, height and scale and the interface with adjoining land identified for residential development; and
 - ii) The relationship between building facades and the street including but not limited to setbacks, glazing, pedestrian entrances and building orientation and the provision of awnings to pedestrian areas.

6 OTHER REQUIREMENTS

6.1 Variations to Coastal Activity Centre NLA

The maximum NLA included in Table 2 may be exceeded where the requirements of *State Planning Policy 4.2 Activity Centres for Perth and Peel* are met to the satisfaction of the WAPC in consultation with the City of Wanneroo.

Table 2 – Centre Floorspace Allocation for Coastal Activity Centre

	Minimum Net Lettable Area to be demonstrated (square metres)	Maximum Net Lettable Area (square metres)
Retail	N/A	5,650sqm
Commercial/Office	N/A	3,680sqm
Lifestyle	N/A	1,500sqm
Medical Centre	N/A	1,000sqm
Hotel	N/A	11,000sqm
Total	N/A	22,830sqm

6.2 Secondary Transit System Route

The landowner/developer and the City of Wanneroo are required to liaise with the Public Transport Authority during the planning, staging and construction process to allow for the progressive provision of a high frequency bus service along the STS route, including the implementation of bus priority measures. Any vehicular access to the STS route should not adversely impact on its safety and functioning.

6.3 Development Contribution Arrangements

The provision of community infrastructure and services to be provided in accordance with the Alkimos-Eglinton Development Contribution Plan.

6.4 Coastal Foreshore Reserve

The coastal foreshore reserve as identified on the Structure Plan Map is to be ceded free of cost at the time of subdivision or development in accordance with *State Planning Policy 2.6 - State Coastal Planning Policy*.

7 ADDITIONAL INFORMATION

Table 3: Additional Information

Documentation	To be approved/supported PRIOR to the lodgement of a subdivision application	To be Approved / Implemented as a CONDITION of subdivision approval	Approving Authority
Vegetation and Fauna Management Plan	X	X	City of Wanneroo on advice from the Department of Biodiversity, Conservation and Attractions and the Department of Water and Environmental Regulation.
Bushfire Management Plan	X	X	City of Wanneroo and Department of Fire and Emergency Services
Residential Density Code Plan	X	X	Western Australian Planning Commission on advice from City of Wanneroo
Urban Water Management Plan		X	City of Wanneroo/Department of Water and Environmental Regulation.

Foreshore Management Plan		X	City of Wanneroo
Conservation Area Management Plan		X	City of Wanneroo
Public Open Space Plan	X		City of Wanneroo



PART TWO

Explanatory Section

alkimos coastal village structure plan

1. Planning Background
2. Statutory, Strategic and Policy Framework
3. Site Conditions and Constraints
4. Context Analysis
5. Placemaking Drivers
6. Place Needs Analysis
7. The Local Structure Plan
8. Infrastructure Co-ordination and Servicing
9. Implementation

ALKIMOS COASTAL VILLAGE STRUCTURE PLAN – PART TWO EXPLANATORY SECTION

1 PLANNING BACKGROUND

1.1 Introduction and Purpose

The Alkimos Coastal Village Local Structure Plan (ACVLSP) has been prepared pursuant to the requirements of Part 9 of the City of Wanneroo District Planning Scheme No. 2 (DPS 2), City of Wanneroo Local Planning Policy 4.2 *Structure Planning, the Planning and Development (Local Planning Schemes) Regulations 2015, Structure Plan Framework and Structure Plan Digital Data and Mapping Standards*, August 2012.

The purpose of the ACVLSP is to refine the level of planning detail provided in the Agreed Alkimos Eglinton District Structure Plan (AEDSP) to guide subdivision and development of land in the 'Urban Development' zone as it relates to the Alkimos Coastal Village.

The Vision:

The Alkimos Coastal Village will be a vibrant destination, connecting the greater Alkimos community to its regional beach. The natural characteristics of the coastal village surrounds will create an unsurpassed coastal experience unique to Alkimos. The foreshore will be an energetic and lively place with a distinct coastal flavour. This is to be complemented by a specialised retail and entertainment precinct that serves both visitors and residents alike, within easy reach to both the immediate community and the wider region. Higher density built form will identify and complement the foreshore strip ensuring the activation of this family friendly and community focused location.

1.2 Land Description

1.2.1 Location

The ACVLSP area is situated within the greater Alkimos-Eglinton district, approximately 40km north west of the Perth Central Business District (CBD) within the City of Wanneroo. The land is bordered by the Indian Ocean to the west, the Water Corporation's Alkimos Waste Water Treatment Plant (WWTP) and associated buffer to the east, Parks and Recreation reserve to the north, and the future

residential development of the South Alkimos Local Structure Plan area to the south.

Figure 1 illustrates the location and extent of the subject site.

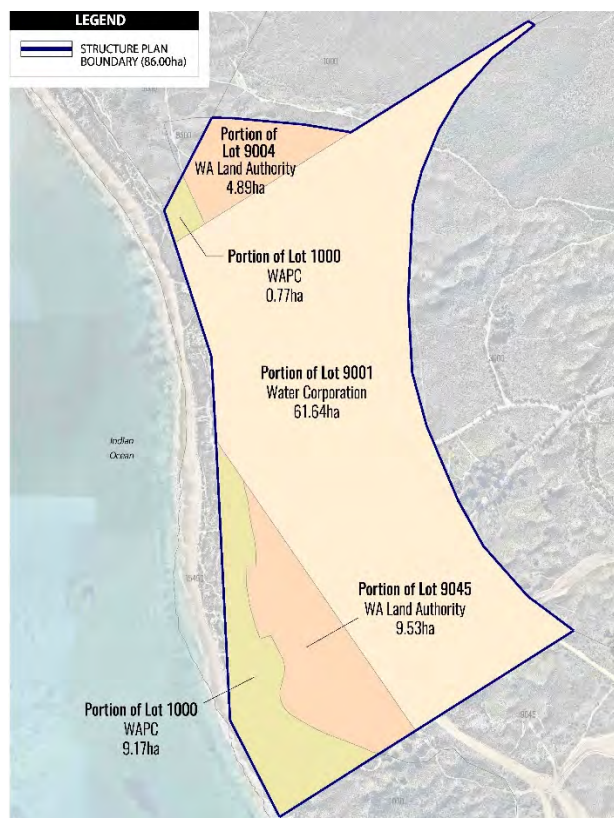
Figure 1: Location Plan



1.2.2 Lot Description, Ownership, Area & Land Use

The ACVLSP area comprises four landholdings totalling approximately 86 ha.

Lot Number	Owner	Certificate of Title	Area (ha)
Portion of 9001	Water Corporation	Plan 69492 Volume 2771; Folio 785	61.64
Portion of 9004	Western Australian Land Authority	Plan 416641 Volume 2969; Folio 62	4.89
Portion of 9045	Western Australian Land Authority	Plan 415997 Volume 2968; Folio 477	9.53
Portion of 1000	Western Australian Planning Commission	Plan 409771 Volume 2914; Folio 419	9.94
Total:			86

Figure 2: Land Ownership Plan

Lot 9001 was purchased by the Water Corporation in the 1970s as a future site for a Waste Water Treatment Plant (WWTP) to service the development in the North West Corridor of the Perth Metropolitan Region. Regional planning for the Alkimos-Eglinton area undertaken in the late 1990s and early 2000s identified that the proposed location of the Alkimos WWTP would sterilise potentially significant coastal land. The location of the WWTP was modified through MRS Amendment 1029/33 which became effective in June 2006 moving the WWTP east to create land for a regional coastal node on the beach front.

The Alkimos WWTP currently serves a population of 100,000 people and has a treatment capacity of 20 million litres per day. It will be expanded over time to treat 160 million litres per day to handle expected demand in Perth's northern suburbs beyond 2050.

POS site 'G' is located within the structure plan boundary of the *South Alkimos Local Structure Plan No. 72* (South Alkimos LSP). An amendment will be required to omit POS 'G' from the South Alkimos LSP boundary area.

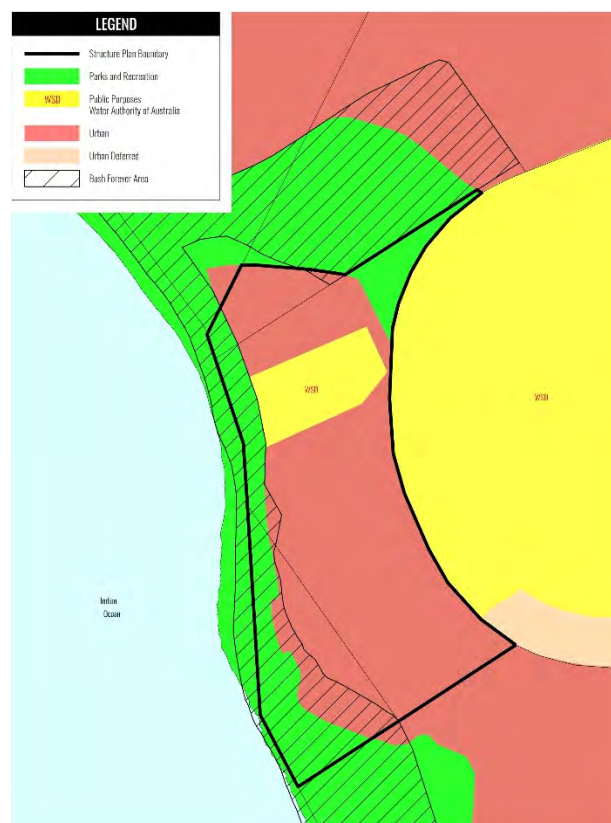
The ACVLSP area is currently vacant and unimproved.

2 STATUTORY, STRATEGIC AND POLICY FRAMEWORK

2.1 Zoning & Reservations

2.1.1 Metropolitan Region Scheme

Pursuant to the Metropolitan Region Scheme (MRS), majority of the ACVLSP area is zoned 'Urban'. A 'Parks and Recreation' reservation abuts the north eastern and western portion of the ACVLSP area, and a central area is reserved for 'Public Purposes – Water Authority WA' (Figure 3 refers).

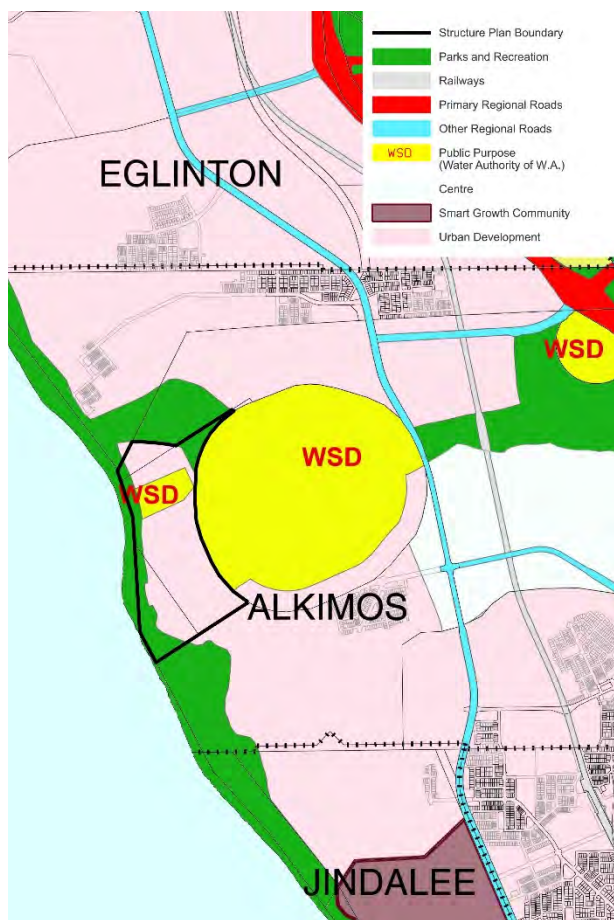
Figure 3: MRS Zonings and Reservations Plan

A Notice of Delegation for 'bush forever area' applies to the western portion of the 'Parks and Recreation' reservation and a small portion of 'Urban' zoned land within the ACVLSP area. Further details regarding this bush forever area are provided under Section 3.2.3.

2.1.2 City of Wanneroo District Planning Scheme No. 2

Under the provisions of the City of Wanneroo DPS 2 majority of the ACVLSP area is zoned 'Urban Development', with portions reserved 'Parks and Recreation' and 'Public Purposes – Water Authority of WA' consistent with the MRS (Figure 4 refers).

Figure 4: City of Wanneroo DPS 2 Zoning Plan



2.2 Alkimos Eglinton District Structure Plan

The ACVLSP falls within the south-west part of the Alkimos Eglinton District Structure Plan (AEDSP) area (Figure 5 refers). The Agreed AEDSP was approved by the City of Wanneroo and endorsed by the Western Australian Panning Commission (WAPC) in 2010.

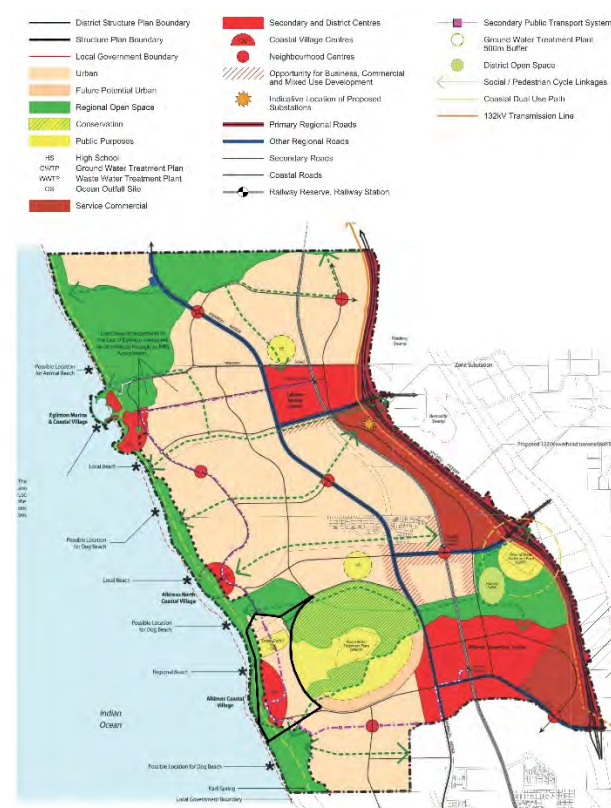
The AEDSP provides a broad district level land use strategy defining the strategic planning framework for the subject land. The AEDSP (report and plan) form the framework for more detailed local structure

planning over the duration of the project, which will be developed to reflect changing planning trends, demographics, community needs and market demands.

The Agreed AEDSP nominates a mix of 'Urban' and Coastal Node Activity Centre uses over the ACVLSP area and reflects the Regional Open Space and Public Purpose reserves in accordance with the MRS. The AEDSP also identifies a 'Secondary Public Transport System' traversing the centre of the site in a north-south direction. Given that the AEDSP is a broad level planning document it also notionally defined the extent of the regional coastal node.

This Local Structure Plan is consistent with the intent of the adopted AEDSP, with the general arrangement of land uses and infrastructure as depicted on the AEDSP Map.

Figure 5: AEDSP Overlay



2.3 Adjoining Local Structure Plans

2.3.1 South Alkimos Local Structure Plan No. 72

South Alkimos LSP was adopted by the City of Wanneroo and endorsed by the WAPC in 2012. It relates to an area of approximately 230ha and directly abuts the subject land to the south and southwest. The South Alkimos LSP also encompasses a 6ha portion of land and a portion of conservation POS which are included within the ACVLSP area.

This 6ha portion of land is annotated on Plan 1 of the South Alkimos LSP as 'Area Subject to Further Planning', and the report specifies that planning is to be deferred until such time that structure planning has occurred over the adjoining landholdings. This portion has therefore been included within the proposed ACVLSP area to provide for an integrated development outcome.

A portion of conservation POS 'B', as annotated on Plan 1 of the South Alkimos LSP, is also included within the ACVLSP area. The South Alkimos LSP will undergo a Local Structure Plan amendment to omit this portion of conservation POS from the South Alkimos LSP boundary area.

The South Alkimos LSP shows a design interface to the ACVLSP area, which includes public open space and road connections, including an indicative STS route along the western boundary. The proposed ACVLSP has been designed to integrate with the agreed South Alkimos LSP layout.

2.3.2 North Alkimos Local Structure Plan No. 73 (Shorehaven)

The *North Alkimos Local Structure Plan No. 73* (North Alkimos LSP 73) area, whilst not directly abutting, is located to the north of the ACVLSP area.

The North Alkimos LSP was formally adopted by the City, subject to modifications in May 2011 however has not yet been endorsed by the WAPC.

The boundary of the ACVLSP area is separated from the North Alkimos LSP area by a 'Parks and Recreation' reservation and therefore the design does not directly interface the subject land.

2.3.3 Central Alkimos Local Structure Plan No. 95

The *Central Alkimos Local Structure Plan No. 95* (Central Alkimos LSP) abutting the ACVLSP area to the north was formally adopted in February 2017. The Central Alkimos LSP encompasses a total area of approximately 255ha and shows a design interface to the ACVLSP area, comprising Regional Open Space reserve and *Neighbourhood Connector* road link.

The proposed ACVLSP has been designed to integrate with the Central Alkimos LSP layout, namely the road connection through the Regional Open Space reserve.

2.4 Relevant State Government Strategies & Policies

The following State Government policies and strategies are considered relevant and applicable to the ACVLSP area:

- *WAPC Directions 2031 and Beyond – Spatial Planning Framework for Perth and Peel*
- *WAPC Draft Outer Metropolitan Perth and Peel Sub-Regional Strategy*
- *Bush Forever*
- *SPP 2.6 State Coastal Planning Policy*
- *SPP 2.8 Bushland Policy for the Perth Metropolitan Region*
- *SPP 4.2 Activity Centres for Perth and Peel*
- *SPP 3.1 Residential Design Codes*
- *Guidelines for Planning in Bushfire Prone Areas*
- *Liveable Neighbourhoods*
- *Perth and Peel @ 3.5 Million*

- *SPP 3.7 Planning in Bushfire Prone Areas*

The ACVLSP is consistent with the intent and principles of the relevant State Government policies.

2.5 Relevant Local Government Strategies and Policies

The following Local Government policies and strategies are considered relevant and applicable to the ACVLSP area:

- *Draft Coastal Management Plan*
- *Local Environmental Plan (2009-2014)*
- *Local Biodiversity Strategy*
- *LPP 3.1 Local Housing Strategy*
- *Economic Development Strategy*
- *LPP 3.6 Employment Policy*
- *LPP 3.2 Activity Centres*
- *LPP 2.1 Residential Development*
- *LPP 2.4 Site Works and Retaining for Residential Development*
- *LPP 4.21 Coastal Assets*
- *LPP 4.3 Public Open Space*
- *LPP 4.4 Urban Water Management*
- *LPP 4.5 Subdivisional Retaining Walls*
- *LPP 4.13 Caves and Karstic Features*

2.5.1 Other Approvals and Decisions

The following approvals and decisions are relevant to the ACVLSP area:

- MRS Amendment 1029/33 relating to the entire Alkimos-Eglinton region, was referred to the Environmental Protection Authority for assessment under the *Environmental Protection Act 1986*. As a result of the formal environmental assessment and the MRS Amendment assessment process the majority of the ACVLSP area was zoned 'Urban' under the MRS.

The portion of foreshore reserve that occupies the western margin of the ACVLSP area was reserved for 'Parks and Recreation' which forms part of Bush Forever Site No.397.

- The EPA during its assessment of MRS Amendment 1029/33 did not identify any areas of 'regional conservation significance' within the 'Urban' zoned portion of the ACVLSP area.

3 SITE CONDITIONS AND CONSTRAINTS

3.1 Landform and Soils

The existing topography within the ACVLSP area comprises undulating limestone and sand dune landform with younger dunes close to the coast and older more stable dunes further inland. The area varies in height from 43m above sea level in the east along the dunal ridges to less than 4m AHD to the west within the foreshore reserve.

Geological mapping indicates the ACVLSP area primarily contains Quindalup dune formations generally aligned in a south-west to north-east orientation, with swales between dune ridges. Geology varies from Safety Bay Sands in the west to calcarenite and kankar in the east.

The dominant soil type for the ACVLSP area is Quindalup (Q3).

The existing landscape character is shown on **Figures 6 - 9**.

Figure 6: Topography (site boundary shown as red line)

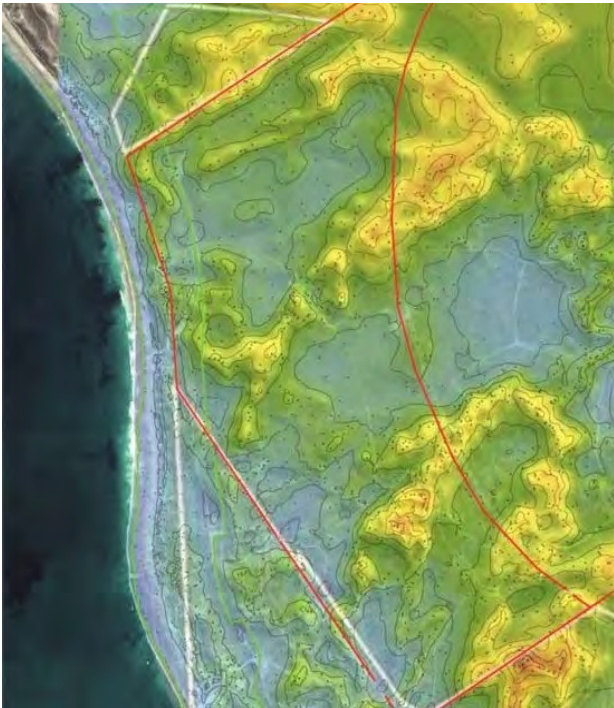


Figure 7: High areas (green) and high points (red)

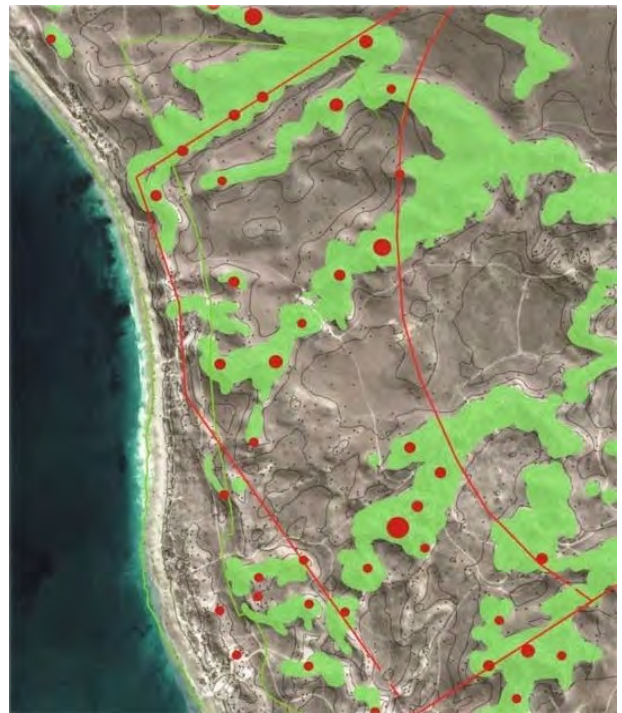


Figure 8: Hills (red closed circles) and hollows (green open circles)

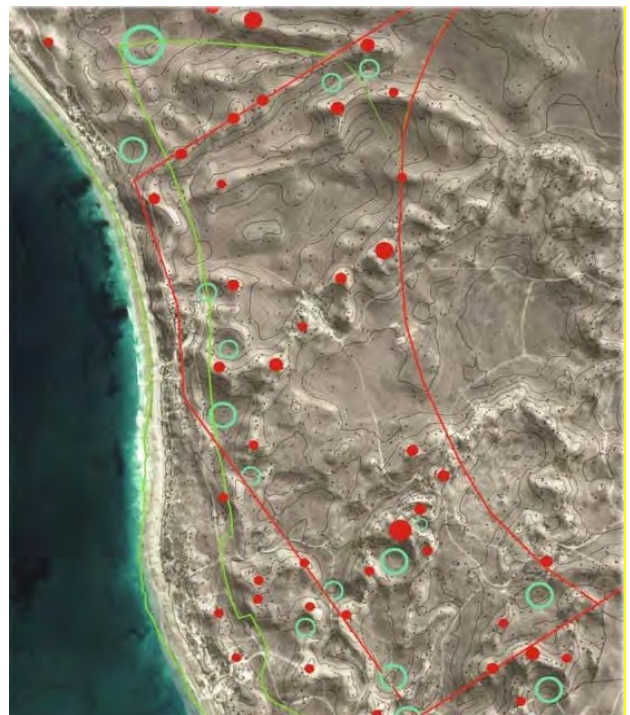


Figure 9: Landscape Rooms (within blue ovals) - refer Section 7.8.1



3.1.1 Acid Sulfate Soils

Acid Sulfate Soil (ASS) risk mapping compiled by the Department of Water and Environmental Regulation (DWER) indicates that the entire ACVLSP area has no risk of ASS occurring within 3m of natural soil surface or deeper.

3.1.2 Karstic Ground Formations

Karstic ground formations are known to occur in the limestone rock band running north-south along the eastern side of Wanneroo Road, well clear of the ACVLSP area. The Alkimos Water Alliance has excavated an area, east of the ACVLSP area, for the Alkimos Waste Water Treatment Plant. The excavation extends 3m AHD in some areas, in limestone rock, and there has been no evidence of karstic ground conditions. Similarly, there has been no karstic evidence experienced in excavation at Peet's Shorehaven (to the north), at Satterley's Eden Beach (to the south) or Lend Lease/Development WA's Alkimos Beach (to the south east) to date. Based on this evidence it is considered very unlikely that the ACVLSP area contains karstic ground formations.

3.2 Biodiversity and Natural Area Asset

3.2.1 Vegetation and Flora

Vegetation and flora of the Alkimos–Eglinton region has been comprehensively investigated during the planning for the site over the last two decades. Detailed vegetation assessment and condition

mapping over Alkimos–Eglinton region was undertaken by ATA Environmental in 2003 to support the formal EPA assessment of MRS Amendment 1029/33. The results of the 2004 survey are reproduced in the Local Environmental Impact Assessment and Management Strategy (**Appendix 1** refers) for the ACVLSP site.

In liaison with the CoW, and the landowners the following additional site investigations were undertaken within the ACVLSP site:

- A Level 2 Flora and Vegetation Assessment (ecologia Environment 2017) (Appendix 1 refers);
- Black Cockatoo Habitat assessment (PGV Environmental 2018).

The assessment and key outcomes from the ecologia Environment 2017 report have been summarised in the Local Environmental Impact Assessment and Management Strategy along with the 2003 ATA Environmental assessment.

A summary of the key findings is provided below:

- The ACVLSP area has previously been used for agricultural purposes (specifically grazing) resulting in significant areas that predominantly support weeds;
- The ACVLSP area predominantly supports Quindalup vegetation complex;
- Local vegetation mapped across the coastal dune complex includes the low closed forest of *M. lanceolata* – *Callitris preissii* and the closed scrub of *Acacia rostellifera*;
- The remnant dune vegetation is dominated by *Melaleuca systema* and *Lomandra maritima*;
- The only trees on the site are scattered tuart trees (*Eucalyptus gomphocephala*), which generally occur in on the peaks of the dune near the WWTP buffer and the foreshore reserve;
- Other plant species located on portions of the site include zamia palms and grass trees;
- Most of the vegetation condition is slightly disturbed (or 'very good to degraded') or obviously disturbed (or 'degraded to completely degraded');
- No EPBC Act or BC Act-listed Threatened Flora or other flora species of conservation significance were recorded in the ACVLSP area.

3.2.2 Fauna

A number of fauna surveys have been completed in the Alkimos region over the past 20 years. Information on the fauna species likely to occur within the ACVLSP area has been drawn from a number of sources and is summarised below:

- The habitats within the ACVLSP area can be broadly separated into four major types, comprising of Quindalup heath, cleared pasture/grassland and tuart trees;
- Of the significant fauna species considered most likely to occur within the ACVLSP area, the Carnaby's Black Cockatoo is considered most relevant;
- The ACVLSP area contains limited foraging habitat for the Carnaby's Black Cockatoo, which is protected under the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (EPBC Act). There is a small area of approximately 8.72ha of potential foraging habitat within the ACVLSP. The proposed ACVLSP design retains approximately 3.72ha within the ACVLSP development area and approximately 2.21ha within the 'Public Purpose' boundary.
- An assessment on the potential impacts on black cockatoo habitat was undertaken by PGV Environmental in 2018 (Appendix 1 refers)
- The tuart trees present within the ACVLSP area were identified to be of poor quality during a survey in 2008 and therefore unlikely to provide any breeding or significant foraging habitat.
- There is no evidence of roosting or breeding by Carnaby's Black-Cockatoo within the site.

Figure 10: Site Conditions within the ACVLSP area.



3.2.3 Bush Forever

The ACVLSP area includes foreshore along its western boundary reserved for 'Parks and Recreation' under the MRS. This area is part of Bush Forever Site No. 397 which forms part of a semi-contiguous north-south vegetated coastal strip. It is considered to contain ecological and linkage values and will be managed as conservation reserve, where appropriate.

Bush Forever Site No. 397 was included in the original WAPC Bush Forever Assessment in 2000. The EPA's formal assessment of the site determined that area '7a' of Bush Forever Site No. 397 (which traversed parallel to the existing foreshore reserve) was no longer considered regionally significant as its environmental values were protected elsewhere over the MRS Amendment area (EPA Bulletin 1207). Therefore, the EPA recommended that area '7a' not be reserved for 'Parks and Recreation' as part of MRS Amendment 1029/33.

On this basis '7a' was removed from the final 'Parks and Recreation' reservation and was zoned 'Urban'. The Department of Planning, Lands and Heritage (DPLH) has confirmed that area '7a' can support residential development consistent with the MRS 'Urban' zoning despite its delegation as Bush Forever under the MRS. The DPLH recognises this anomaly and has confirmed Bush Forever boundaries will be updated at a later date to be consistent with the foreshore 'Parks and Recreation' reservation.

3.2.4 Ecological Linkages

The ACVLSP area abuts the east-west conservation linkage associated with the Alkimos WWTP buffer on the eastern boundary. This area is not currently identified as a Bush Forever site, however is reserved for 'Parks and Recreation' and 'Public Purposes' under the MRS.

A portion of land within the southern extent of the ACVLSP area has been set aside for conservation Public Open Space (POS). This conservation POS has been retained to provide an alternative linkage around the eastern and southern side of the Alkimos WWTP. In accordance with the City of Wanneroo's Local Biodiversity Strategy, the creation of this additional conservation POS linkage will ensure that the distance between remnant vegetation in the area is no greater than 1000m.

The landform that will be retained is a relatively intact Q3 dune.

3.3 Groundwater and Surface Water

3.3.1 Wetlands

A review of the *Geomorphic Wetlands on the Swan Coastal Plain dataset* (DEC 1992) indicates that there are no geomorphic wetlands within the ACVLSP area.

3.3.2 Groundwater

The ACVLSP area is partially located within a Priority 3 (P3) Drinking Water Source Area, and as such is subject to restricted land uses. The P3 classification areas are defined to 'manage the risk of pollution' to the water source from catchment activities. All of the land uses proposed under the ACVLSP are classified as 'Acceptable' within P3 areas.

Groundwater data from the *Perth Groundwater Atlas* shows that groundwater levels across the ACVLSP area are less than 1m AHD with groundwater flowing in a westerly direction. Depth to groundwater is highly variable due to the undulating topography of the ACVLSP area. Groundwater monitoring of the ACVLSP area indicates depth to groundwater ranges from 11.2m to 28.4m. Groundwater elevation was observed to vary between approximately 0.29m AHD and 1.04m AHD.

Given the groundwater elevations and the minimum site elevations, the minimum clearance to groundwater will be 3m, however for the majority of the ACVLSP area it will be greater than 10m.

3.3.3 Surface Water

The hydrological characteristics of the ACVLSP area are dominated by the high infiltration capacity of the soils onsite. This results in little to no surface runoff except during extreme events. When combined with the steep slopes on-site and localised low points, the result is that there will be no runoff leaving the ACVLSP area.

3.4 Bushfire Hazard

Bushfire hazard risk and assessment has been undertaken in accordance with the WAPC's *Guidelines for Planning in Bushfire Prone Areas (2017)* and *SPP 3.7 – Planning in Bushfire Prone Areas*. **Appendix 2** outlines compliance and mitigation measures.

3.5 Heritage

Ethnoscience was commissioned to conduct a desktop survey of the Aboriginal heritage values of the ACVLSP area and to prepare an Aboriginal Heritage Management Plan (AHMP) to assist in managing any Aboriginal cultural heritage sites that may be found in the future.

A search of the online Aboriginal Heritage Inquiry System (AHIS) indicates that there are no Aboriginal Sites or 'Other Heritage Places' currently listed within the ACVLSP area (**Appendix 3** refers).

This is confirmed in the ethnographic and archaeological survey of the WWTP area undertaken by O'Connor, Quartermaine and Bodney (1990) which reported no sites of Aboriginal significance and no archaeological material within the ACVLSP area. The 2005 archaeological survey by O'Reilly had the same result.

In the event that an unidentified Aboriginal site is discovered during the course of earthworks or construction activities within the ACVLSP area the procedures set out in the AHMP will be followed.

The northernmost extremity of adjacent shoreline is also relatively exposed, with a wide flat beach backed by a steeply sloped dune face. The dune crest heights for this area were estimated to be at approximately +25m AHD.

3.5.1 The Coastline

The ACVLSP area is positioned directly adjacent to the coast and associated foreshore reserve. The coastline in the vicinity of the ACVLSP area is predominately an uninterrupted sandy shoreline.

The present landscape of the southern portion of the adjacent coastline encompasses a small salient that has formed in the lee of Eglinton Rocks and is characterised by a smaller primary dune that is backed by a higher secondary dune system further inland. The beach is relatively flat and narrows as it progresses around the headland.

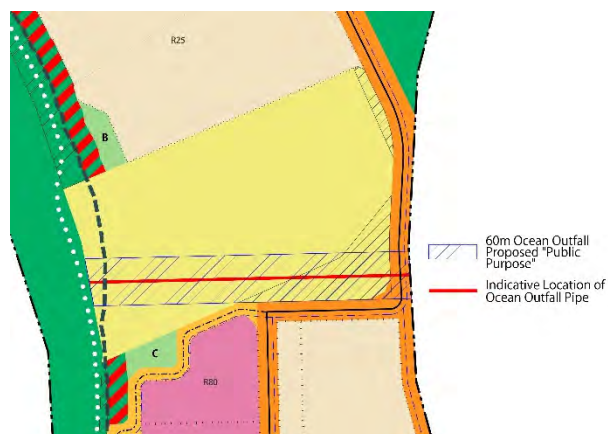
The shoreline adjacent to the northern section of the ACVLSP area is a relatively exposed section, with a wide flat beach backed by a small primary dune fronting a substantial secondary dune system. This section of beach also has limestone rock outcrops present in the dune systems.

The northernmost extremity of adjacent shoreline is also relatively exposed, with a wide flat beach backed by a steeply sloped dune face. The dune crest heights for this area were estimated to be at approximately +25m AHD.

Section 7.5 outlines proposals for the coast and the foreshore area and addresses SPP2.6.

3.6 Water Corporation Infrastructure

The 'Public Purpose' reservation within the northern portion of the ACVLSP contains the Water Corporation Ocean Outfall Site. The Ocean Outfall Site presently contains a single outlet pipe that conveys advanced secondary treated wastewater flows from the WWTP 3.7 km offshore. An indicative location of the outfall pipe is provided in **Figure 11** over-page.

Figure 11: Indicative Location of the Outfall Pipe

It may be necessary to duplicate the current ocean outfall pipe as development within the northwest corridor increases. As such, Water Corporation has retained a portion of the area reserved 'Public Purpose' for future construction purposes. Subject to the full build out, Water Corporation reserves the right to review the extent of the reservation required and potentially reduce or increase as necessary.

Water Corporation will consider temporary compatible land uses within the Ocean Outfall Site on an interim basis, subject to WAPC development approval.

The Ocean Outfall Site may be developed with a range of commercial, recreational, civic and cultural land uses. Rezoning is not required for compatible interim land uses provided they do not prejudice the Water Corporation's operational requirements for the Ocean Outfall Site.

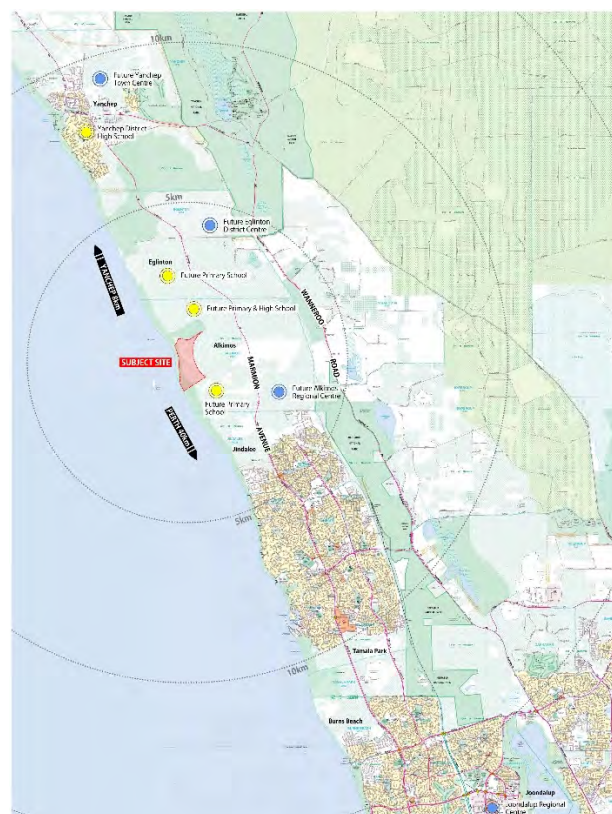
Initial subdivision application for the ACVLSP area will create the Ocean Outfall Site as a super lot, reflecting the future MRS 'Public Purpose' reservation.

In the longer term, once the Ocean Outfall pipe has been duplicated, it will be necessary to integrate the Ocean Outfall Site with the surrounding area. Any future development, post duplication of the Ocean Outfall pipe, will be subject to rezoning and normal planning requirements, including provision of a foreshore reserve as per SPP 2.6.

4 CONTEXT ANALYSIS

4.1 Regional Context

The ACVLSP area is located approximately 40 kilometres north-west of the Perth CBD within the City of Wanneroo and the north-west sub-region of the Perth metropolitan region. It is located approximately 17 kilometres north of the Joondalup Strategic Metropolitan Centre and approximately 8 kilometres south of the Yanchep Strategic Metropolitan Centre.

Figure 12: Regional Context Plan

4.2 District Context

The ACVLSP area is located in the western portion of the Alkimos locality, directly abutting the coast. It is situated approximately 1.5 kilometres west of the future Alkimos Secondary Activity Centre and Marmion Avenue.

The potential for a Marina in this location has been identified in several previous documents, including a study undertaken by the former Department of Planning and Infrastructure (DPI), now Department of Transport, in 2008. The ACVLSP has been prepared in such a way that should the marina be developed, full integration between the sites will be achieved (see concept diagram below).



The Marina does not form part of this Structure Plan and should it be required it will be subject to a separate Structure Planning exercise.

Figure 13: Local Context and Constraints Plan



4.3 Existing Movement Network

4.3.1 Existing Road Network

The following key roads are located within close proximity to, and will facilitate access to the ACVLSP area:

- Mitchell Freeway identified as a *Primary Distributor*, ultimately to be constructed through to Yancheep in the north when traffic volumes on alternative north-south routes such as Marmion Avenue and Wanneroo Road require its construction; and
- Marmion Avenue, Romeo Road and Alkimos Drive identified as *Integrator Arterial A* roads will serve to distribute traffic throughout the district. Marmion Avenue is currently constructed as a two lane road and will be upgraded to a four lane road when traffic volumes warrant the upgrade.

4.3.2 Existing and Planned Public Transport Routes

There are currently no public transport services operating through the ACVLSP area. Bus services 490 & 491 currently operate along Marmion Avenue connecting Two Rocks in the north to the Butler Train Station in the south. This service operates approximately 21 journeys per weekday and 10 to 14 journeys on weekends.

The closest rail station is Butler, which is located approximately 5km to the southeast of the ACVLSP area.

The public transport network included in the DSP has been assumed as the planned and committed external public transport network. The key characteristics are:

- The Yancheep Rail Extension project will extend the existing Joondalup Line railway a further 14.5km between Butler and Yancheep, with new stations, bus interchanges and park and ride facilities at Alkimos, Eglinton and Yancheep; and
- Provision of an STS route through Alkimos and Eglinton, ultimately connecting the main development centres.

4.3.3 Existing Pedestrian and Cycle Networks

There are currently no existing amenities for pedestrian and cyclists within the ACVLSP area or immediate vicinity. A regional coastal recreation path is planned along the western boundary of the ACVLSP area and a Shared Path Network will link to South Alkimos LSP area to the south and Central Alkimos LSP area to the north.

4.3.4 External Connectivity

Marmion Avenue and the Mitchell Freeway will provide the key regional road transport links, while the proposed STS route will provide the key public transport link for the ACVLSP area to the broader Alkimos-Eglinton district.

4.4 Activity and Employment Centres

Currently the nearest existing activity centre is the Alkimos Gateway Local Centre, which is located approximately 2km east of the ACVLSP area along Marmion Avenue.

The Alkimos Eglinton DSP nominates a hierarchy of activity centres for the Alkimos-Eglinton district, a number of which are planned within close proximity of the ACVLSP area, including:

- Alkimos Secondary Activity Centre – with potential for 65,000m² gross leasable area (GLA) under the DSP and will function as a major retail centre incorporating a wide range of regional uses. The Alkimos Secondary Activity Centre is located approximately 1.5km east of the ACVLSP, positioned between Marmion Avenue and the Mitchell Freeway road reserve;
- Eglinton District Activity Centre – complimenting the Alkimos Secondary Activity centre has the potential for 20,000m² GLA under the DSP. Located approximately 4.5km north east of the ACVLSP area, the Eglinton District Activity Centre will accommodate a mix of land uses and will create an important focal point for the Eglinton community; and

- Alkimos North Coastal Node – is planned at the northern end of the regional beach approximately 1.5km north of the ACVLSP area. Pursuant to the North Alkimos Local Structure Plan No. 73 the Alkimos North Coastal Node will function as a Neighbourhood Activity Centre with the potential for approximately 3,500m² net lettable area (NLA).

4.5 Education

The DSP identifies the preferred location for public primary schools and high schools based on the Department of Education and Training (DET) criteria, in addition to making provision for private high schools. The DSP does not identify the provision of any schools within the ACVLSP area, however a number are located in the immediate vicinity, including:

- Two Primary Schools within the South Alkimos LSP area;
- A High School within the Central Alkimos LSP area; and
- A Primary School within the North Alkimos LSP area.

The Edith Cowan University in Joondalup is the closest tertiary education facility, though future tertiary facilities are proposed within the Yanchep development to the north and potentially within the Alkimos Secondary Activity Centre.

4.6 District and Regional Open Space

The ACVLSP area includes and is bordered to the south, west and north by land reserved for 'Parks and Recreation' under the MRS and known as Regional Open Space.

The area of Regional Open Space (Foreshere) along the western margin of the ACVLSP area is part of Bush Forever Site No. 397 which forms part of a coastal ecological linkage.

The ACVLSP area also abuts the east-west ecological linkage, which together with the Alkimos WWTP buffer connects Bush Forever Site No. 130 north of the Alkimos Secondary Activity Centre to the coast.

The DSP identifies district recreation facilities for the Alkimos-Eglinton district. There are no district recreation facilities planned within the ACVLSP area, however district recreation facilities are planned adjacent to the Alkimos Secondary Activity Centre within Regional Open Space.

There is also potential for an aquatic and recreation centre to be co-located with a tertiary provider adjacent to the Alkimos Secondary Activity Centre, this is subject to further planning.

4.7 Demographic Profile of Existing/Nearby Communities

The Community Development Plan prepared by Creating Communities includes an analysis of emerging demographic and population health trends for the Alkimos-Eglinton district (refer **Appendix 6**). The following section provides a summary of the key findings of this analysis.

The population projections for the Alkimos Eglinton district show a regular but rapid growth in population from 2009 through to 2041, with a projected population of 54,600 at build out. Whilst it is early days in the development of the district, emerging demographics in the region seem to suggest the following trends compared to State averages:

- Higher than average numbers of children and young people (0-17 years);
- Less proportions of tertiary education, and young workforce (25-34 years);
- Higher proportions of English, South African and Scottish;
- High proportions of Anglicans;
- Less people with higher degrees and vocational training;
- Far lower percentages of people living with disabilities;
- Sectors of employment are generally similar but with less workers engaged in the mining sector and double state averages in construction (20%);
- The predominant professions are technicians, trade workers and labourers;
- Higher individual incomes;
- Using the train to get to work is almost double state averages with far lower bus use and much higher taxi use;
- Far less people walk to work than state averages;
- Higher levels of unpaid domestic work and nearly twice as many provide unpaid childcare;
- Far less volunteerism;
- Nearly double the number of couples with children;
- Half the number of one parent families; and
- One third the number of lone person households.

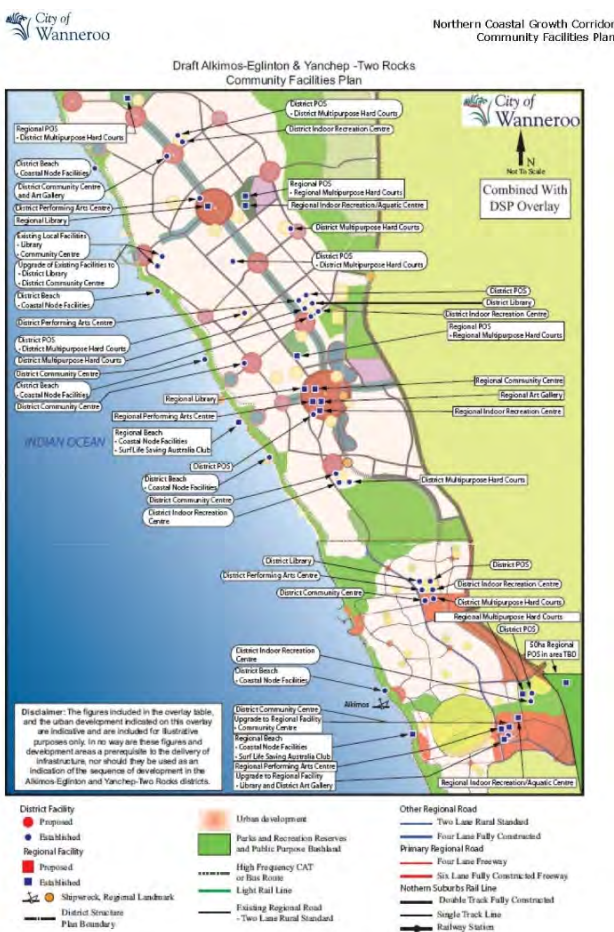
4.8 Community Infrastructure

The AEDSP defines the community, social and health facilities that should be provided to serve the district population. It nominates the provision of a Surf Life Saving Club within the ACVLSP area to serve the Alkimos Regional Beach.

Plan 1 depicts an indicative location for the Surf Life Saving Club; alternative locations within the ACVLSP area will be investigated prior to finalisation.

The City of Wanneroo has also undertaken community facilities planning for the Alkimos-Eglinton District as part of its northern coastal growth corridor community facilities planning process. Figure 14 shows how the City of Wanneroo plans to distribute community facilities throughout the Alkimos–Eglinton region.

Figure 14: Alkimos Eglinton and Yanchep Two Rocks Community Facilities Plan



- The Village’s status as a **regional coastal node and associated regional beach** providing significant amenity for the local population and becoming increasingly attractive as a day trip and overnight destination within the North West Corridor. The stretch of coastline adjacent to the ACVLSP area has been identified as a regional beach with the largest of the three coastal nodes within the Alkimos Eglinton District Structure Plan (AEDSP) area.
- **Centrality of its location** on the coast in a high growth corridor. Strategic location of the place in relation to connecting the broader AEDSP area to the regional beach and Alkimos Secondary Activity Centre.
- **Relative location to the Alkimos Secondary Activity Centre** which will perform a complementary role in drawing activity from a wider catchment area and increase overall activity at the regional beach and the coastal village.
- **Future size, composition and character of the economic activity** in the Village as defined by the broader AEDSP framework. It nominates a ‘Coastal Node Activity Centre’ within the ACVLSP area, strategically positioned to provide an important coastal focal point for the community creating an intensive lifestyle and recreational village, incorporating regional beach facilities, including a Surf Life Saving Club.
- **Emerging demographics and population trends** in the Alkimos Eglinton district suggesting trends which vary from State averages.
- The **physical structure** of the surrounding area and **existing landscape elements** including primary dominant landform of dunes covered with coastal heath and significant conservation areas to the north and south. The natural attributes of the site influence the place character through strong connections between the water, coast and land beyond.
- **Proximity to Water Corporation’s Alkimos Waste Water Treatment Plant** site (facility and associated buffer) which represents a significant footprint on the landscape. Interface with the facility and broader connectivity to the surrounding areas will be addressed through the LSP process.

5 PLACE MAKING DRIVERS

To facilitate the development of a thriving community it is important to understand the overarching context of which the land belongs. This includes understanding the existing statutory and strategic planning framework, regional, district and local context and specific site/place characteristics and assets. Key findings of this overarching context have been used to inform the following **place drivers** for the Coastal Village:

6 PLACE NEEDS ANALYSIS

6.1 Holistic Approach to Place

Recognising the regional significance of the Alkimos Coastal Village, the LSP will facilitate the development of an integrated community, which includes a variety of:

- Leisure, recreation and social engagement activities;
- Access and mobility opportunities;
- Ecological encounters;
- House typologies; and
- Economic pursuits.

Transformative change is to be instigated by providing opportunities that are not typically experienced in the northwest corridor (for example higher than average densities' on the coast, intergenerational communities, universally accessible links and connections through the community, sustainable village concepts / showcase).

6.2 Summary of Economic Findings

The economic strategy for the LSP area (**Appendix 7**) outlines the following key drivers of the economic health for the Alkimos Coastal Village:

- Coastal location which has significant amenity benefits and tourism related benefits;
- Centrality on the coast in a high growth corridor – location of the Coastal Village between Sorrento (nearest surf lifesaving club to the south) and Yanchep which has a seasonal surf lifesaving club to the north;
- Relative location to the Alkimos City Centre which performs a complementary role in drawing activity from a wider catchment area and increases overall activity at the regional beach and also the Coastal Village;
- Local resident population and their relative affluence living in a coastal location; and
- Strong potential for Government investment, particularly given the recent State Government policy to invest in and revitalise regional beaches.

These economic drivers, if successfully captured and delivered, will underpin the economic health of the Alkimos Coastal Village and support the creation of a dynamic local business, investment and employment environment.

The economic vision for the LSP area is to establish a high amenity, attractive and economically competitive Coastal Village in the North West Corridor of Perth. The Coastal Village will leverage the natural comparative advantages of its proximity to a regionally-significant beach to support high quality population servicing and tourism/visitor activity. It will also accommodate a diverse range of housing products, including above average residential densities that will enable the area to achieve its true economic potential.

As such this development will be underpinned not just through the strategic coastal location which will benefit from the tourism and 'beyond trade' benefits, but also from a higher density of residential population. The Coastal Village will therefore bolster the local economy in providing a location for local businesses and employment and diversification in the residential product within the wider Alkimos region.

6.3 Summary of Social and Cultural Findings

This emerging picture of the region's demographics suggests community development strategies and other broader initiatives are required to:

- Make tertiary education options more accessible;
- Attract a diverse demographic profile (age, household, country of origin, aboriginal and non-aboriginal, people with and without disabilities);
- Generate a broad range of employment options close to home;
- Provide facilities for religious observance;
- Provide more public transport options;
- Provide child care services; and
- Provide opportunities for volunteerism.

Additionally, State health trends suggest that where possible initiatives are required to address:

- Increases in diabetes and obesity, skin cancer and other cancers;
- Lower consumption of fruit and vegetables in children aged 12-15;
- Low levels of physical activity in children; and
- Bullying and mental health problems in children

The project can play a role in mitigating some of these health trends through the following:

- Provision of fitness infrastructure and activities;
- Access to health care professionals; primary, allied and alternative health care services;
- Shaded public open space;

- Physical activities targeted at children;
- A range of community activities for all ages; and
- A community garden.

6.4 Summary of Environmental Findings

The findings of the Local Environmental Impact Assessment and Management Strategy for the LSP area (**Appendix 1** refers) are summarised and outlined below:

- Vegetation across the site is thick coastal bush with occasional larger trees and the majority ranges in condition from slightly disturbed (or 'very good to degraded') or obviously disturbed (or 'degraded to completed degraded').
- A number of fauna surveys have been completed in the Alkimos region over the last 20 years using a range of trapping programs. Where reasonably practicable, the abundance, diversity, geographic distribution and productivity fauna species and ecosystem levels should be maintained through the avoidance or management of adverse impacts and improvement in knowledge.
- The black cockatoo habitat assessment identified approximately 8.72ha of Carnaby's Black Cockatoo habitat within the ACVLSP. The ACVLSP design proposes to impact approximately 2.79ha of the identified 8.72ha foraging habitat.
- The ACVLSP is designed to minimise impacts on fauna through habitat loss and fragmentation through the provision of a Conservation POS area which is 2.09ha in size. This Conservation POS area provides strategic ecological corridors and retains vegetation through the site. The inappropriate use of conservation areas should be discouraged through appropriate design responses and passive surveillance.
- Portions of the Conservation POS may need to accommodate in the future, subject to detailed engineering design, road batters and drainage. Any disturbed areas (e.g. drainage/batters) will be revegetated after construction.
- To manage littering/illegal dumping a number of management measures are recommended including the placement of signage informing the public that littering is illegal; locating rubbish bins at regular intervals along access paths; and the placement of fencing around conservation areas that is permeable to most fauna.

- Key issues for the long-term management of conservation areas in an urban setting include avoiding incremental degradation through ongoing appropriate management; providing appropriate access to encourage responsible use of the conservation area; and fostering community awareness and involvement.
- The Foreshore Management Plan (FMP) will include detail regarding the location of community facilities, open space areas, possible drainage areas and access pathways.
- It is noted that the proposed north-east road connection to Central Alkimos will require battering into the 'Parks and Recreation' reserve. Roads are permitted (required) to cross this area of 'Parks and Recreation' reserve in accordance with the MRS Amendment 1029/30 (Ministerial Statement 722; area 9c refers).
- The site is partially located within a Priority 3 Public Drinking Water Source Area (PDWSA).

6.5 Summary of Place Needs Analysis

As a result of the above findings the ACVLSP has attempted to embed flexibility and robustness into its planning in order to capture the essence of place and to facilitate growth and development that will reflect the needs of the community as it evolves.

Key considerations that should be taken into account at various stages of development include:

- The provision of diverse and intergenerational housing typologies that facilitate the growth of a diverse community.
- Opportunities for sustainable built form options (such as wind, solar, water, food production and waste management) where possible.
As technology evolves these options will be more widely accepted and available and should be considered in order to reduce the ecological footprint of the community.
- A variety of land uses, located to facilitate convenience, that will support local community and economic development opportunities such as food & beverage, cafes, local retail, child care, community garden, men's shed, dog park, local leisure and recreation opportunities (i.e. tennis court, beach volley ball, skate park, basketball, rock pool, bike hire and local markets).

- Healthy, connected communities that facilitate universal design principles throughout the development (i.e. removal of kerbs where possible) and streets as places for people; a plethora of leisure, recreation and informal social engagement opportunities; and technology and social media to connect people for business and leisure purposes

7 THE LOCAL STRUCTURE PLAN

7.1 Vision

*The Alkimos Coastal Village will be a vibrant destination, connecting the greater Alkimos community to its **regional beach**. The natural characteristics of the coastal village surrounds will create an unsurpassed coastal experience unique to Alkimos. The foreshore will be an energetic and lively place with a distinct coastal flavour. This is to be complemented by a specialised retail and entertainment precinct that serves both visitors and residents alike, within easy reach to both the immediate community and the wider region. Higher density built form will identify and complement the foreshore strip ensuring the activation of this family friendly and community focused location.*

The ACVLSP vision has been developed with sound community planning and placemaking principles in mind. A Community Development Plan prepared by Creating Communities expands on the above development vision of the Alkimos Coastal Village (**Appendix 6** refers). The following themes identified in the Community Development Plan provide direction and structure for all community based elements of the project, with an orientation towards social sustainability.

7.1.1 Water is Life

The 'water is life' theme is supported by the principles of innovative water, verdant landscape and urban interface with the coast. These concepts aspire to facilitate a connection between people and nature, supporting the themes of the Village and educating people around local biodiversity preservation.

Strong links to the regional beach, as it is one of the main attractors, will be essential to draw people to and from the beach and the commercial precinct, in addition to providing a destination for return visits.

The design of the landscaping will enable interesting, easy safe and sheltered access to the beach.

7.1.2 Inner City Life by the Sea

The Alkimos Coastal Village will be a high amenity, coastal village in the North West Corridor. It will leverage the natural comparative advantages of its proximity to a regionally-significant beach to support high quality population servicing and tourism activity.

It will also accommodate a diverse range of housing products, including above average residential densities that will enable the area to achieve its true economic potential, offering greater variety than current developments to create a unique inner city lifestyle, attracting young families and older households alike. This will be supported by a diverse range of high quality food & beverage and boutique retail as well as local health and lifestyle services.

Movement and connections will focus on ease of access to green spaces, facilities, district centres and public transport.

7.1.3 Ocean Marketplace

The economic vision is to establish a high amenity, attractive and economically competitive coastal village in the North West Corridor. Early support and facilitation of the local economy is essential.

This vibrant and energised destination will attract regional audiences, which offers a thriving and entrepreneurial place to support new businesses and provide opportunities for new business models and local employment.

The proposed residential density represents a transformative change in the way coastal nodes have been developed in Western Australia and will result in the economic potential of the local area being maximised.

The unique economic drivers will underpin the Village's contribution to the District's economic health. Examples of these features include commitment to the diversified local business and employment base, a shift to Strategic Industry employment and industries (e.g. commercial office and tourism) overtime and the delivery of critical enabling infrastructure like public transport connections.



7.2 Place Strategy

The purpose of the place strategy is to apply a multifaceted approach to planning and design of a place, focused on providing an additional layer of consideration into land use planning to facilitate higher quality place outcomes.

Planning for the Village has been based on a holistic approach, considering the broader Alkimos Eglinton 'place'. The Village has been identified as a regional beach with the largest of the three coastal nodes within the Alkimos Eglinton District Structure Plan (AEDSP) area. The AEDSP acknowledges the broader vision for the northern growth corridor within which the Village is located.

The approach to planning for this 'place' is to provide diversity and a point of difference with regard to sense of place and belonging between the three coastal nodes in the Alkimos Eglinton DSP area.

Alkimos Coastal Village Place Strategy has been developed based on comprehensive analysis of surrounding land uses, existing communities, demographics, place characteristics and assets, strategic growth plans, economic and community development plans.

The aim is to create a location that will achieve:

- a strong sense of place that reflects the character of the natural landscape;
- functional efficiency to suit the needs of residents, visitors and community members alike;
- environmental harmony through the incorporation of sustainable measures into design and development of the Village;
- a high quality of life for all people who live within or visit the Alkimos Coastal Village;
- economic vitality through the implementation of the Economic Development Action Plan;
- a platform for community development that will enable community members to grow their community to meet their needs and thrive; and
- innovative public and private partnerships which will overcome challenges and enable growth and prosperity.

7.2.1 Overall Place 'Definition' and Character

Consideration has been given to the extent of the 'Coastal Village' which covers the LSP area in its entirety, with the spatial arrangements, density, design and function of the places underpinning the Village's regional function.

With its natural green areas, links to the ocean and proposed higher than average densities the character of the land lends itself to the feel of an 'inner city living' by the sea. Overall, the site will provide a vibrant destination connecting the greater Alkimos community to the regional beach, where the design will 'echo' the dunal formations and feel.

The well-structured streetscapes will facilitate a high level of activation and intrigue through the integration of building facades and built form, amenity, awnings/shelters, path design, seating, trees and land uses.

It will be important to identify economic pursuits that will activate the community through first stages of development. The creation of local business community groups will assist in identifying economic pursuits that will support the character, feel and theme of the development as seen by the community. Strong links to the beach, as it is one of the main attractors, will be essential to draw people to and from the beach and 'commercial' precinct.

Alkimos Coastal Village's narrative of place will be central to the project's success. This narrative, articulated in the project vision is built up from local site opportunities, emerging patterns in demographics, best practice in community development and placemaking. The resulting strategies will capitalise on the inherent opportunities of the project to ensure that people from all walks of life come together, to transact, celebrate and support each other.

This approach is of critical importance to ensure that the vibrancy of the development is achieved, self-sufficiency of the community is enabled and equitable outcomes for all are delivered.

Investment in community activation, placemaking, on-going stakeholder engagement and the attraction of significant partnerships and alliances to the project will facilitate the delivery of memorable destination that can boast a high quality of life for its community.

7.2.2 Response to Place Characteristics

The Village will anchor the broader Alkimos Eglinton area from an amenity, lifestyle and tourism perspective.

The Village is expected to support approximately 23,000m² gross floor area of shop-retail, commercial, office, medical and health, community services and hotel development land uses. Its focus will be on the delivery of a diverse and active retail precinct underpinned by a wide range of community facilities, medium to high density residential nestled within a beautiful landscape of natural green areas adjacent to the coast.

Figure 15: Master Plan



The Coastal Village will foster places that encourage physical activity for people of all ages, include universally accessible indoor and outdoor, passive and active opportunities. There will be an abundance of shade and resting points.

It will be important to identify opportunities to encourage beach goers to remain covered to reduce skin and other cancer. This could include public art elements in the form of umbrellas, or shaded deck chairs to encourage people to sit under shade on the beach.

Other critical elements include the location of key services and facilities, such as the child care centre, in close proximity to local growers markets and open space/community gardens to provide opportunities to structure programs around these facilities to deal with issues such as obesity, diet, active play and mental health.

These types of spaces, initiatives and programs are linked to sustainability themes within the development and will also influence the well-being and mental health of all community members.

7.2.3 Built Form

The 'core' activity within the Alkimos Coastal Village will be centred around the intersection of 'Main Street' and the 'Neighbourhood Connector – Secondary Transit System', characterised by a critical mass and scale to distinguish it from other parts of the Village.

Maximum building heights are to be in accordance with the requirements of *State Planning Policy 7.3 Residential Design Codes* (Volumes 1 and 2), unless otherwise provided for in a Local Development Plan.

The indicative Master Plan envisages that the taller and more compact built form (approximately **5-storeys** – with opportunities for increased height in appropriate landmark buildings) will be concentrated around the core (within the R-AC1 area), with the surrounding built form transitioning down to **3 – 4-storeys** (within the Mixed Use R80 areas).

These buildings should be designed with adaptable ground floor and activated frontages to cater for residential and non-residential land uses.

Main Street (the central east-west road) will link the Town Park (POS F) and retail centre to the Surf Lifesaving Club and Regional Beach.

Concentration of non-residential and residential land uses compacted within a taller built form will create a more urban feel to activate the centre. Local retail uses will be accommodated at the ground level of buildings, with opportunity for office and residential to be located above.

At ground level, a range of land uses and design treatments such as 'adaptable spaces' and reduced front setbacks will provide street activation whilst the upper floors of residential and non-residential land uses provide opportunity for passive surveillance to the adjacent public streets and places.

Reduced setbacks and active street frontages will create a sense of intimacy.

It is also envisaged that the streetscapes will provide opportunities for street trees and canopy cover to foster a greater participation rate of cyclist and pedestrian foot traffic. Other architectural elements such as awnings can be implemented to create a more comfortable pedestrian and cycle movement.

A vibrant foreshore promenade, abutting the coast, will provide for active ground floor frontages and alfresco dining opportunities.

Built form adjacent to the foreshore and the coastal road are to be designed with active ground floor frontages along this primary street frontage.

It is envisaged that the streetscape will employ street trees and other architectural elements to provide canopy cover.

A foreshore dual use path, which will extend the entire length of the ACVLSP abutting the coast, will provide pedestrians and cyclists with uninterrupted access to the foreshore and beach environment.

Finally, the built form is envisaged to transition to **1 - 2-storeys** as the development is further away from the coast and the 'core'.

The streetscape provides the opportunity to establish a 'leafy-suburb', creating a comfortable walking and cycling environment for residents as well as visitors.

7.3 Land Composition

The land use composition provides for a diverse mix of land uses ranging from retail, commercial and tourism, to medium and high density residential. The intent of the land use mix is to facilitate a diverse and interactive regional Coastal Village supporting high levels of amenity and allowing for a vibrant and robust economy to evolve truly reflective of its regional status.

The land use composition, including Public Open Space provision is outlined in **Table 2** over-page.

Table 2 – Land Use Budget

Land Use Budget	Area (ha)
Subject LSP Area:	
Portion Lot 9001:	61.64
Portion Lot 9004:	4.89
Portion Lot 9045:	9.53
Portion Lot 1000:	9.94
Total Area:	86
Deductions:	
Drainage 1:1yr:	0.51
Commercial:	3.36
Regional Open Space (Foreshore):	16.76
Parks and Recreation:	3.32
Sewer Pump Station Site	0.14
Public Purpose (Ocean Outfall):	9.69
Public Purpose (AWWTP):	1.65
Asset Relocation Area:	1.66
Surplus Restricted POS:	0
Surplus Conservation POS:	2.097
Surplus Unrestricted POS:	0
Total Deductions:	39.17
Developable Area:	46.83
Typical POS Requirement 10%:	4.68
Maximum Restricted POS (2%):	0.94
Minimum Unrestricted POS (5%):	2.33
Maximum Conservation POS (3%):	1.41
ACVLSP POS Requirement 5%:	2.34
Maximum Restricted POS (2%):	0.94
Maximum Unrestricted POS (3%):	1.40

7.4 Residential

7.4.1 Density

Part 1 of this ACVLSP allocates the Residential Design Codes density ranges for the area. The densities will be controlled via the Residential Design Code Plan at the time of subdivision. A robust range of densities is proposed to ensure the Village can support the needs of different demographics and lifestyles and respond to changes in market demand over time. Moreover, the provisions of Residential Design Medium Density Codes (single house development standards) apply to the density codes as nominated on Plan 1.

The allocation of residential densities on the Residential Design Code Plan will be in accordance with the following criteria:

R25 – R40 density range:

- A base density code of R25 is applicable for all residential lots within this range, particularly where needed to allow for landform and vegetation protection/retention and in locations adjacent to the Alkimos Waste Water Treatment Plant.

- Density coding of R40 applies where:
 - within 200 metres of the Coastal Activity Centre;
 - adjacent to the Secondary Transit System (STS) Route; or
 - adjacent to Public Open Space.

Residential density elsewhere within the Structure Plan area shall be in accordance with the densities as identified on the Structure Plan Map.

7.4.2 Dwelling Forecasts

Based on the proposed range of residential densities, the ACVLSP area forecasts approximately **2,222 dwellings**.

The ACVSLP complies with the dwelling yield targets of the AEDSP, well exceeding the minimum 20 dwellings/ha gross, within 1km catchment (500m) either side of the STS route.

7.4.3 Directions 2031 Forecasts

The *Directions 2031* and accompanying *Outer Metropolitan Perth and Peel Sub-Regional Strategy* sets a target of 22,000+ dwellings for the broader AEDSP area. Based on the 'Connected City' scenario under *Directions 2031* an average yield of 15 dwellings per gross urban zoned hectare is required.

The estimated dwelling yield for the ACVLSP area well exceeds the requirements of *Directions 2031* under a 'Connected City' scenario.

7.4.4 Lot Typologies

The ACVLSP area provides a range of residential densities to accommodate a mix of lot typologies and ultimately dwelling types. The dwelling type yields for the ACVLSP area are as follows:

Dwelling Type	Indicative Dwelling Yield
Single Dwellings	646
Grouped Housing/Multiple Dwellings	1,576
Total:	2,222

7.5 Coast and Foreshore

7.5.1 State Planning Policy 2.6 – Coastal Planning Policy

State Planning Policy 2.6 Coastal Planning Policy (SPP 2.6) provides guidance on the process for planning and development in coastal areas. Pursuant to SPP 2.6 coastal foreshore reserves are required to accommodate a range of functions and values.

A coastal foreshore reserve is set aside, in public ownership to allow for likely impacts of coastal hazards (i.e. physical coastal processes) and provide protection of public access, recreation and safety, biodiversity and ecosystem integrity, landscape, visual landscape and indigenous and cultural heritage.

The policy highlights the need for the provision of coastal nodes, where identified in a strategic plan, to provide for a range of facilities to benefit the broader public. Schedule One, Section 7 *Variations* of SPP 2.6 recognises that in certain circumstances, and specifically in the case of coastal nodes, development may need to occur within an area identified to be potentially impacted by physical coastal processes within the planning timeframe. Such development needs to be considered within a coastal hazard risk management and adaptation planning process. A *Coastal Hazard Risk Management and Adaptation Plan, 2019* (CHRMAP) has been prepared for the ACVLSP area by Essential Environmental (**Appendix 5**).

Section 5.9 of SPP 2.6; *Coastal Foreshore Reserves*, recognises that the varied and unique nature of the coastal environment in WA, requires flexible approaches to be used in foreshore reserve planning and management, advocating ‘outcome based’ decision making by considering a range of criteria, rather than using a nominal setback requirement. Assessment of a foreshore reserve width should take into consideration the beach classification (e.g. regional, district, local).

AEDSP classifies Alkimos Beach as a **regional beach**.

SPP 2.6 defines ‘regional beaches’ as attracting numbers of people from the local area and region. They have a relatively high level of facilities, infrastructure, commercial development and use. Examples include Hillarys and Cottesloe.

The policy outlines that an appropriate coastal foreshore reserve will include the allowance for physical processes and appropriate width to ensure a coastal foreshore reserve is maintained should the physical processes impacts be realised over the planning timeframe (100 years).

Accordingly, the ACVLSP identifies an **additional** area of coastal foreshore, adjacent to the ‘100 year coastal processes line’, where values, uses, functions and assets can be located at the end of the planning timeframe.

In response to SPP 2.6 requirements, the additional foreshore area is intended to provide a sufficient spatial area available in land under public ownership to accommodate all regional beach assets, as well as values, uses and functions of the existing foreshore reserve beyond the planning timeframe.

7.5.2 Alkimos Coastal Village Hierarchy

7.5.2.1 Alkimos Eglinton District Structure Plan Regional Node Hierarchy

AEDSP designates the hierarchy of the Alkimos Coastal Village and beach as a “**regional beach destination**”. AEDSP identifies the establishment of a coastal village at Alkimos and the adjacent foreshore as an area of concentrated recreational activity within the context of maintaining the natural state of the foreshore in other parts of the district structure planning area. Infrastructure and large numbers of people will need to be located within this area (the area affected by coastal processes) in order to facilitate its function as a “**Regional Beach**” and vibrant “Coastal Village”.

Given that the AEDSP is a broad level planning document, it notionally defined the extent of the regional coastal node. The key focal point for public access within the coastal village is the Coastal Activity Centre (land identified for Commercial and Mixed Use).

7.5.2.2 Environmental Protection Authority Assessment of Foreshore Environmental Values

The width of the coastal foreshore ‘Parks and Recreation’ reservation had previously been considered by the Environmental Protection Authority (EPA) during its assessment of the District Structure Plan and associated rezoning of the land in the MRS (Amendment 1029/33). The MRS document provides further useful context that assists in establishing vision for the area and critical functions of the foreshore reserve.

The principle change made by Amendment 1029/33 that directly affected the ACVLSP area, was the rationalisation and reductions to coastal foreshore reservations in the western part of (the then) Lot 102 to accommodate a coastal node.

The WAPC noted in their response to submissions that the proposed reduction in width was supported “*because of the overall sustainability benefits that will arise from a well designed coastal village, providing amenity to the Alkimos **regional beach**...*”

The EPA made an assessment of environmental values at the site and concluded that the reduction in the foreshore area could be supported on the basis that values, “*while significant and desirable to retain if possible, are protected elsewhere on the site*”.

7.5.3 Technical Assessment Reports

7.5.3.1 Coastal Processes Assessment

In accordance with the requirements of SPP 2.6, a coastal processes assessment has been prepared for 2.4km of the Alkimos coastline, including the stretch adjacent to the ACVLSP area to determine the appropriate width of the physical coastal processes setback (**Appendix 4** report by MP Rogers and Associates refers).

The *Coastal Processes Assessment* has considered the requirements of SPP 2.6 and established the potential landward extent of the effects of coastal physical processes for a range of planning horizons up to and including 100 years. The assessment includes investigation into the potential effects of the following:

- Severe storm erosion;
- Long term shoreline movement; and
- Coastal recession due to potential sea level rise.

These site specific assessments are combined with additional allowances for possible shoreline recession as a result of sea level rise, and for uncertainty to define a possible extent of impact from coastal processes.

The *Coastal Processes Assessment* recommended the total setbacks to allow for the action of physical coastal process within a 100 year planning horizon were calculated to range from 126m – 202m.

7.5.3.2 Coastal Hazard Risk Management and Adaptation Plan

In response to SPP 2.6, a *Coastal Hazard Risk Management and Adaptation Plan* (CHRMAP) has been prepared by environmental consultants, Essential Environmental (**Appendix 5** refers).

This CHRMAP considers the technical outputs from the *Coastal Processes Assessment* and the strategic planning objectives for the ACVLSP area to inform an assessment of coastal hazard risk and develop a proposed suite of management and adaptation measures. The ACVLSP has been prepared in accordance with the CHRMAP.

7.5.4 Foreshore and Coastal Setbacks Response

The design response to the risk management and adaptation measures has been informed by *Coastal Processes Assessment* and CHRMAP.

The status of the ACVLSP area as a **regional** node and beach together with the determination of the EPA that environmental values of the site are protected elsewhere, guided the consideration of a foreshore reserve that provides for the values and services that are required for a regional beach destination. Land to be set aside in public ownership is nominated as 'Coastal Foreshore' on Plan 1. This includes an area of additional coastal foreshore adjacent to the '100-year coastal processes line' where values, functions and assets can be located at the end of the planning timeframe. Moreover, the additional Coastal Foreshore area provides an opportunity for drainage to be accommodated beyond the area at risk of physical coastal processes over the 100-year planning timeframe.

The values and services required to be accommodated within the ACVLSP foreshore reserve are therefore defined as:

- *Recreation and safety* - provided through development of Surf Life Saving Club and associated facilities and as well as other public recreation facilities such as landscaped areas, shelters, seating, tables, barbeques and a playground.
- *Public access to the beach* - a high level of access is required to support outcomes of the AEDSP which sought to protect the environmental values of the foreshore reserve in other areas of the coast by focusing recreational activity at this location.

These values and services can be adequately provided for within the area considered to be at risk from coastal processes within the 100 year planning timeframe. Where land in public ownership is required beyond the planning timeframe for these values and services, it has been specifically nominated as Coastal Foreshore on Plan 1. The Surf Life Saving Club has been accommodated beyond the area considered to be at risk from coastal processes within a 42 year timeframe.

Whilst the location of the Surf Life Saving Club is indicatively shown on Plan 1, the final location will need to be addressed through a Foreshore Management Plan. It should also be noted that the Surf Life Saving Club is an item under the Alkimos-Eglinton Development Contributions Plan.

Key outcomes from the CHRMAP which have been incorporated into the ACVLSP include:

- Establishment of a foreshore reserve which will ensure that the area can continue to provide values, functions and uses required if coastal hazards are realised over the planning timeframe, including area of additional coastal foreshore; and

- Permanent locations for infrastructure critical to the functioning of the regional beach (car parking and Surf Life Saving Club House) have been identified within or adjacent to the foreshore reserve.

Additionally, future actions which will need to be undertaken include:

- Preparation of a Foreshore Management Plan to formally establish and identify the future management requirements of the full extent of the foreshore reserve and Coastal Foreshore;
- Design of permanent infrastructure (e.g. roads) and private property set back beyond the landward extent of possible erosion at the 100 year planning horizon as identified by the coastal processes assessment;
- Design of temporary infrastructure (e.g. landscape assets) set back beyond the landward extent of possible erosion at the planning horizon appropriate to the design life of the asset as identified by the coastal processes assessment;
- Relocation of temporary infrastructure (e.g. landscape assets) to alternative locations when required;
- Monitoring and maintenance of natural and built assets;
- Review of the coastal processes assessment and Foreshore Management Plan will be required periodically to refine relocation requirements for temporary assets and to update asset management actions. The first of these staged reviews should be undertaken in approximately 10 years' time; and
- Community consultation and communication of actions undertaken to manage public safety within the foreshore including relocation of assets where required.

7.6 Activity Centres and Employment

7.6.1 Local Economic Strategy

The Local Economic Strategy (LES) (**Appendix 7**) defines the likely future size, composition and character of economic activity for the ACVLSP area and provides the framework and indicative action plan for stakeholders to facilitate this growth and evolution over time.

The LES recognises the regional status of the ACVLSP area, acknowledging it will anchor the Alkimos region from an amenity, lifestyle and tourism perspective and help achieve visitation to the area from the broader corridor.

In total, the ACVLSP area is expected to support approximately **23,000m²** Gross Floor Area (GFA) of commercial, tourism and community floorspace. This will be comprised of a combination of shop-retail, commercial-office, medical and health, community services and hotel development. Whilst majority of these uses will be accommodated within the proposed Neighbourhood Activity Centre, the ACVLSP area also nominates some areas for Mixed Use in key location to enhance the lifestyle amenity opportunities for the community.

7.6.2 Neighbourhood Activity Centre

A comprehensive analysis has been undertaken to determine the most appropriate location for the provision of a Neighbourhood Activity Centre within the ACVLSP area. This process included an appreciation of the overall context and vision for the community, the development objectives and principles and an understanding of the economic pressures facing the area.

Zoned 'Commercial' under Plan 1, the Neighbourhood Activity Centre is proposed within the central portion of the ACVLSP area capitalising on the amenity of its coastal location and position adjacent to the Water Corporation's Ocean Outfall Site. This location will facilitate a strong connection to the coast and enable the development of a unique Main Street linking to a vibrant foreshore promenade.

The proposed Neighbourhood Activity Centre will host a mix of land uses and facilitate active ground floor frontages with the opportunity to integrate with the proposed Surf Life Saving Club. Food and beverage and short stay accommodation are features of the proposed foreshore promenade capitalising on views towards the coast. The core of the Neighbourhood Activity Centre will accommodate retail and commercial uses, including a supermarket, offices, shop-retail and community/social services facilities.

Pursuant to Plan 1, the R-AC1 density code will apply to any residential development within the Neighbourhood Activity Centre.

7.6.3 Impact of Centre Hierarchy

The proposed economic development of the Alkimos Coastal Village will have the effect of increasing the role of the Village in the Alkimos Eglinton District centre hierarchy. The AEDSP (Part 2) classified the Alkimos Coastal Village as a Local Activity Centre, along with the other two coastal villages in the broader District.

The original retail report, prepared by Ibecon in support of the AEDSP, identified 3,000sqm of floorspace for the Alkimos Coastal Village at build out. This is above what is regarded as the maximum floorspace for a Local Activity Centre under SPP 4.2 of 1,500sqm Net Lettable Area (approximately 1,750 to 2,000sqm GFA).

AEDSP (December 2010) was released just after the promulgation of State Planning Policy 4.2 *Activity Centres for Perth and Peel* (August 2010). As such, the originally proposed Alkimos Coastal Village was in fact a Neighbourhood Centre, rather than a Local Activity Centre, as originally designated. This aligns with the role and function of the Village as defined in the AEDSP, which was to service a catchment wider than a 200m walkable catchment. As such, the proposed floorspace size and composition of the Coastal Village does not represent a significant or substantive change to the role and function originally devised in the AEDSP.

The size of the retail floorspace, proposed for the Coastal Village, is larger than that identified in the AEDSP. At 5,650sqm GFA, this is 88% higher than the AEDSP estimate. This difference is due to two pertinent factors:

- The AEDSP assumed the Coastal Village would service only the local residential population, which is estimated at a similar level in the 2006 report to this Strategy (5,629 vs 5,635). However, analysis of regional beach locations in metropolitan Perth suggests that the area will likely attract visitation from a wider catchment both within and outside the District. This manifests as both a wider catchment for the Centre as well as higher levels of beyond catchment expenditure (i.e. leisure and tourism visitation).
- The AEDSP retail report was prepared in 2006 and since that time, household incomes and consumer expenditure patterns in Western Australia have changed. The change in demand for different retail offerings, particularly café and restaurant, coupled with higher income growth, means a higher level of retail floorspace is now expected for the Coastal Village.

The proposed Alkimos Coastal Village retail floorspace provision is in line with the original role defined for the centre in the AEDSP. While identified as a Local Activity Centre, its size, role and function are broadly in line with that of a Neighbourhood Activity Centre under the SPP 4.2. The additional retail floorspace reflects greater consideration of the role the Village collocated with a Regional Beach in a wider District and sub-regional catchment, and associated expenditure attracted to the area.

7.6.4 Mixed Use

Mixed-Use areas are proposed in key locations within the ACVLSP area to complement the proposed Neighbourhood Activity Centre and ensure the amenity of an inner-city lifestyle is achieved for all future residents.

Pursuant to Plan 1 and the Location Criteria addressed under Section 7.6.2, the provisions of the R-AC1 density code shall apply to any residential development within areas designated as 'Mixed Use'.

7.6.5 Employment Self Sufficiency

The local employment generation potential has been estimated by applying industry specific workspace ratios to the floorspace estimates for different land uses. The ACVLSP area has the potential to accommodate a total of **847** jobs when the catchment is at residential capacity. This employment will be distributed across tourism, home-based business and retail/commercial uses.

The AEDSP established a minimum employment self-sufficiency target of 60%, this equating to approximately 18,000 jobs. Analysis of the employment and residential staging of the ACVLSP area indicates employment self-sufficiency (ESS) is expected to reach 33.3% when the broader Alkimos Eglinton District is at capacity. Such employment self-sufficiency rates are expected for a predominantly residential area, particularly one promoting above average residential densities (and therefore higher population and workforce yields). The exposure to tourism activities and high amenity population servicing opportunities provides a boost to local employment.

The employment generated and accommodated is expected to be primarily population-serving in nature in early stages of development. This reflects the community and convenience nature of employment generators such as retail, lifestyle and medical activities. However, strategic industry employment generation will increase rapidly in later stages with the development of formal short-stay tourist accommodation and the expected maturity of the local economy.

A summary of key employment indicators for the Alkimos Coastal Village at full build out, approximated to occur by the year 2035, are outlined in **Table 3** over-page.

Table 3: Key Employment Indicators, Alkimos Coastal Village

Indicators	At Completion
Dwellings	2,222
Estimated Population	5,084*
Estimated Workers	2,542
Estimated Employment	847
Employment Self-Sufficiency	33.3%
Strategic Industry Share of Employment	54%

* As calculated in Appendix 7, based on an average of 3.0 persons per household for detached dwellings, and of 2.0 persons per household for attached dwellings. For the purposes of preparing the ACVLSP, an overall average of 2.76 persons per household was applied; giving an estimated population of ~6,103 persons.

7.7 Movement Network

7.7.1 External Road Hierarchy and Site Access

The ACVLSP area is to be served by a number of key roads within the broader surrounding area, including:

- Mitchell Freeway to the far east of the ACVLSP area – ultimate 6-lane freeway, classified as ‘Primary Regional Roads’ in the MRS with a *Primary Distributor* function;
- Marmion Avenue to the east of the Alkimos WWTP – ultimate 4-lane divided arterial, classified as ‘Other Regional Roads’ in the MRS with an *Integrator Arterial A* function;
- Alkimos Drive to the far north-east of the ACVLSP area and connecting to the Mitchell Freeway – ultimate 4-lane divided arterial, classified as ‘Other Regional Roads’ in the MRS with an *Integrator Arterial A* function;
- Alkimos Drive West to the north of the ACVLSP area – 2-lane *Neighbourhood Connector A* linking the ACVLSP area to Marmion Avenue and Alkimos Drive;
- Romeo Road to the far east of the ACVLSP and connecting to the Mitchell Freeway – ultimate 4-lane divided arterial, classified as ‘Other Regional Roads’ in the MRS with an *Integrator Arterial A* function; and
- Graceful Boulevard to the south of the ACVLSP area – 2-lane divided minor arterial, *Integrator Arterial B* linking the ACVLSP area to Marmion Avenue and Romeo Road.

Access into the ACVLSP area is proposed via four key entry points, including:

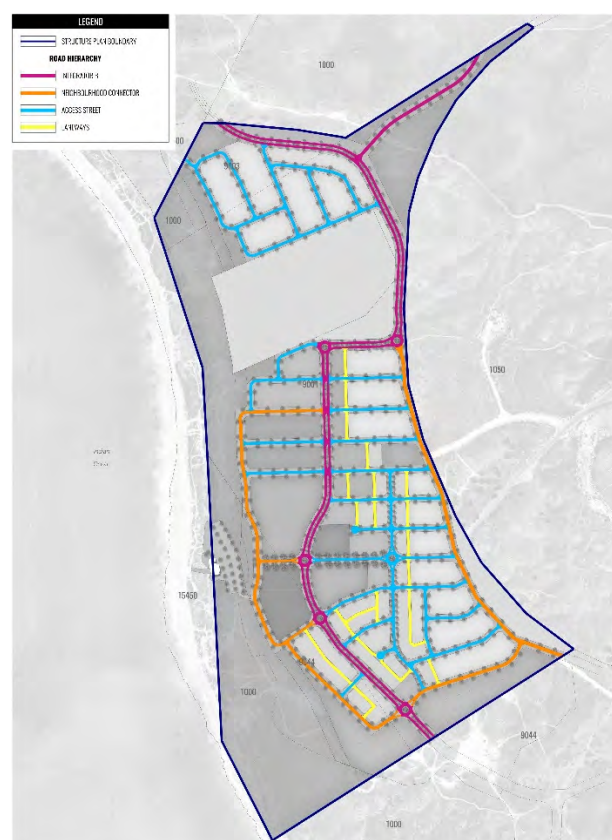
- From the south:
 - An extension of Graceful Boulevard being the Secondary Transit System (STS) Route as prescribed by the AEDSP; and

- Extension of Painted Parkway being the perimeter road to the Alkimos Waste Water Treatment Plant to the north-east.

- From the north:
 - Extension of Commander Drive from Shorehaven Estate; and
 - Extension of Alkimos Drive from Central Alkimos.

7.7.2 Internal Road Configuration and Hierarchy

A road hierarchy is shown on **Figure 16 – Internal Road Hierarchy**, with each of the road typologies detailed below.

Figure 16: Road Hierarchy.

7.7.2.1 STREET CROSS-SECTIONS

The following cross-sections are proposed on roads within the ACVLSP:

- Residential and mixed use laneways: **6m** reserve width, with **1m** setback for garages;
- Residential access streets: **16m** reserve width;
- Neighbourhood Connectors: reserve widths in the range of **18-25m**; and
- District Distributor B (as per Main Roads WA Metropolitan Functional Road Hierarchy): **25m** reserve width with median.

The proposed road reserve widths, carriageway formations and provision of footpaths/shared paths are expected to adequately cater for the anticipated future traffic volumes and the intended function of the roads.

The cross-section provisions for laneways, access streets and neighbourhood connectors are consistent with the guidance provided in *Liveable Neighbourhoods*.

The proposed distributor through the LSP provides sufficient road reserve width to be designed as an Integrator B which is also consistent with the guidelines provided in *Liveable Neighbourhoods*.

7.7.2.2 DISTRICT DISTRIBUTOR ROADS

The proposed *Distributors* will provide the main north-south traffic connection within the ACVLSP.

A 25m road reserve is proposed for the STS Route road. This 2-lane boulevard style road comprises 7.5m wide pavements, incorporating 3.5m carriageways, 1.5m cycle lane and 2.5m on-street parking bays, a 3m central median and 3m verges. The proposed 3m verge width will provide suitable space in which to accommodate landscaping and a 2.1m wide Shared Path.

Figure 17: Artist impression – STS route.



7.7.2.3 NEIGHBOURHOOD CONNECTOR B ROADS

The proposed *Neighbourhood Connector B* road provides supplementary north-south connectivity within the ACVLSP area. Where accommodating service traffic associated with the Neighbourhood Activity Centre land uses the proposed 18m road reserve comprises a 6.5m wide trafficable pavement and 5.75m wide verges, incorporating on-street parking, footpath and landscaping.

Where the road reserve is not required to accommodate service traffic, a reduced trafficable pavement width of 6m is proposed and increased verge width of 6m to provide increased on-street parking opportunities.

Figure 18: Artist impression - Main Street.



There are currently two options being investigated for the proposed road design adjacent to the foreshore reserve.

The first option comprises a 7m wide trafficable pavement, with 5.5m wide verges incorporating a Shared Path to the eastern side and a footpath to the western side.

The second option provides a 2-lane divided 'promenade' style road design, incorporating 4m wide trafficable pavements, a 2m central median, with a 5.5m verge to the western side and 2.5m wide verge to the eastern side.

Figure 19: Artist impression road design adjacent to the foreshore reserve.



7.7.2.4 ACCESS STREETS

Generally all local access streets serving residential land uses will comprise 16m road reserves with 6m wide trafficable pavement and a maximum 5m verge width. Projected traffic volumes for this type of road are expected to be less than 1,000 vpd.

A variant on the typical access street design is proposed where projected traffic volumes are likely to exceed 1,000 vpd. This is the case where local access streets serve a mix of both residential and commercial land uses.

The 16m road reserve will comprise a wider trafficable pavement of 7.4m with the capacity to accommodate on-street parking and reduced verge widths of 4.3m.

Where fronting public open space, Access Street verges may be reduced to minimum 2.5m depending on the location and alignment of services, street parking and pedestrian traffic.

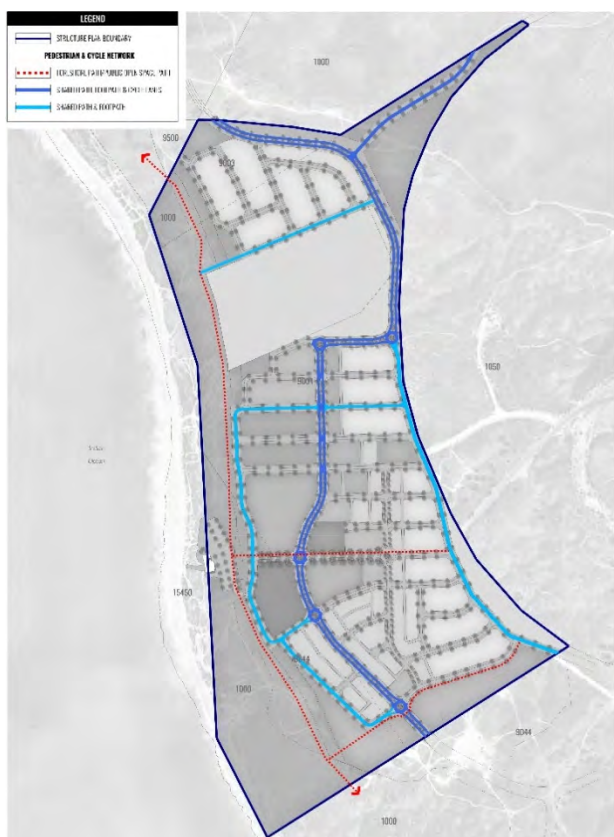
7.7.2.5 LANEWAYS

The typical road reserve for laneways entails a 6m wide trafficable pavement sufficient to allow two-way vehicle movement, rubbish collection and vehicle access into garages located on the rear properties.

7.7.3 Pedestrian and Cycle Network

The pedestrian and cycle network will provide an excellent level of accessibility and permeability for pedestrian and cyclists, including connections to surrounding areas (**Figure 20** refers).

Figure 20: Pedestrian and Cycle Network



The key features of the proposed pedestrian and cycle network are summarised below:

- In accordance with the Alkimos-Eglinton DSP, a recreational path will be provided within the Foreshore Reserve as part of the foreshore facilities. This can also function as an Emergency Access Way;
- A secondary network of recreational paths will be incorporated into proposed POS area and will link to the wider network of paths;
- Within the proposed Neighbourhood Activity Centre an 'urban' verge footpath will be provided to both sides with varying widths to suit pedestrian needs and the provision of street furniture;

- A Shared Path will be provided to one side of all proposed Neighbourhood Connectors, with a footpath provided on the opposite side;
- Cycle lanes will also be incorporated adjacent to the trafficable carriageway on both sides of all Neighbourhood Connectors; and
- Typically, for local access streets a footpath will be provided to both sides, however where traffic volumes and pedestrian volumes are expected to be sufficiently low and traffic speeds are low a footpath will only be provided to one side.

7.7.4 Public Transport

In accordance with the Alkimos-Eglinton DSP, the ACVLSP area will be served by the STS Route which is a high frequency bus route. The STS will operate between Eglinton Station and Alkimos Station and will be accommodated within the proposed central north-south road.

The eventual target service frequency for the STS route is 10 minutes during peak periods and 15 minutes during inter-peak periods. Bus stop location and design will be determined at the subdivision stage in consultation with Transperth and the City of Wanneroo.

Initially, buses are likely to operate at approximately 20 minute frequency in peak periods and 30 minutes during inter-peak periods. Evening and weekend frequency is likely to be 60 minutes both initially and in the longer term.

Figure 21: Public Transport



7.8 Public Open Space

The ACVLSP proposes a total of **3.95ha** of creditable Public Open Space which represents **8.43%** of gross subdivisible area. A POS Plan and Landscape Strategy Plan are provided as Figures 22 and 23. A Landscape Strategy (**Appendix 9** refers) summaries the proposed landscaping to streets and provides POS typologies.

In accordance with the City's *Local Planning Policy 4.3 Public Open Space* (LPP 4.3) and the AEDSP the proposed Public Open Space areas have been distributed and design based on the following rationale to:

- Create a functional and integrated open space network;
- Provide a web of green links designed to tie in with the existing local landscape character and enhance connectivity to the beach;
- Allow for landscape corridors in key locations to provide linkages between the Alkimos WWTP and the foreshore reserve;
- Retain and protect key landscape features and natural dune vegetation;
- Ensure a relationship with the Water Corporation's 'Ocean Outfall' and the proposed Neighbourhood Activity Centre; and
- Enhance the level of amenity for residents and contribute to the visual quality and placemaking opportunities.

Figure 22: Public Open Space (refer Table 4 POS Schedule)



Provide a diverse range of recreational opportunities to respond to the lifestyle needs of the community; and respect 'as appropriate' the foreshore reserve, including preservation of tuarts. The POS areas can be categorised into four types:

- Regional Open Space;
- Conservation Open Space;
- Local Parks; and
- Urban Pocket Park.

The Public Open Space Schedule (**Table 4**), prepared in accordance with the requirements of LN and the City's LPP 4.3, provides a summary of the POS provided noting the final areas will be subject to refinements at detailed subdivision stage.

Table 4: Public Open Space Schedule (refer Figure 22 POS Plan)

(A) Site Area (ha)		86.00	
Less		Area (ha)	
Regional Open Space (Foreshore)	16.76		
Regional Open Space	3.32		
Coastal Foreshore Reserve Asset Relocation Area	1.66		
(B) Total	21.73		
(C) Total Net Site Area (A minus B = C)	64.27		
Deductions			
Commercial Zone	3.36		
Public Purpose (Ocean Outfall)	9.69		
Public Purpose (AWWTP)	1.65		
Sewer Pump Station Site	0.14		
Drainage (Bioretention - First 15mm)	0.51		
Surplus Restricted POS	0.000		
Conservation POS	2.097		
(D) Total	17.44		
Public Open Space Contribution			
(E) Gross Subdivisible Area (GSA) (C minus D = E)	46.83		
(F) Public Open Space Requirement (10%)	4.68		
May comprise:			
(G) Min 8% Unrestricted Open Space (E x 8%)	3.75	4.68	
(H) Max 2% Restricted Open Space (E x 2%)	0.94		
Unrestricted Open Space			
POS Reference	Area (ha)		
A	0.3809	3.3999	
B	0.1274		
C	0.12		
D	0.3454		
E	0.2451		
F	0.4024		
G	0.876		
H	0.9027		
(I) Total Unrestricted Public Open Space	3.40		
Restricted Open Space - Urban Water Management (1:1yARI to 1:5yARI)			
POS Reference	Area (ha)		
A	0.0568	0.5487	
B	0.0705		
C	0.0532		
D	0.0521		
E	0.0751		
F	0.0716		
G	0.1051		
H	0.0643		
(J) Total Restricted Public Open Space	0.55		
Unallocated Restricted Open Space - Surplus area above 2%	0.000		
(K) Total Public Open Space Provision (K = I + J)	8.43%	3.95	
Conservation Open Space - City of Wanneroo's Local Planning Policy 4.3 may comprise:			
3% of the 8% Unrestricted Public Open Space (ha)		1.41	
POS Reference	Area (ha)		
G	0.9798	2.0968	
H	1.117		

7.8.1 Landscape Character Areas

The proposed landscape strategy includes four (4) landscape character areas conceived as landscape 'rooms':

- Coastal Neighbourhood – primarily residential area with an understated and informal landscape style;
- Coastal Urban – a formal or 'urban' style of landscaping associated with medium to high density dwellings;

- Dunal Hamlet – includes thick stands of trees to achieve a ‘forest’ effect and a muted landscape materials palette; and
- Beachside – includes a warm landscape materials palette, vibrant public art, robust planting and shaded car parking areas.

Figure 23: Landscape Character Areas



7.8.2 Landscape Corridors

Most parkland will be arranged along two main east west landscape corridors that provide storage for urban drainage, facilitate community connectivity and improve ecological linkages. Most landscape planting will be native, water wise and low maintenance. Street trees will be mostly native, corresponding with the City of Wanneroo Street Trees Master Plan, arranged to provide shaded, canopied streetscapes with a natural feel.

The Coral Tree (*Erythrina indica*) has been selected as a feature/urban identity tree that is able to be planted as a mature transplant in focal areas within the Activity Centre. It has smooth grey bark and very decorative, dense, trumpet shaped, deep red flower heads and is excellent for coastal areas with a tolerance for sandy soils. The trees will grow approximately 7-10m high, are deciduous and can be trained into a formal, rounded-shaped canopy.

It will instantly provide for necessary urban functions including shade, buffer from winds, land mark/way finding and enhancement of local identity.

This tree is listed in the City’s Street Tree Master Plan.

Figure 24: Coral Tree (*Erythrina indica*)



7.8.3 Park Overview

A general overview of the park arrangements is shown in Figure 25 (over-page).

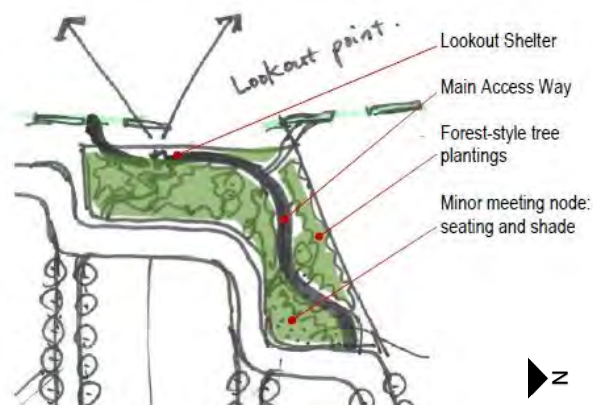
7.8.4 POS Typologies

The POS typologies should be considered in light of the residential densities proposed by the ACVLSP and its position as a regional beach and coastal village, which aims serve as a destination for the wider district.

The following diagrammatic plans indicate examples of spatial arrangements and recreation functions for the various POS typologies:

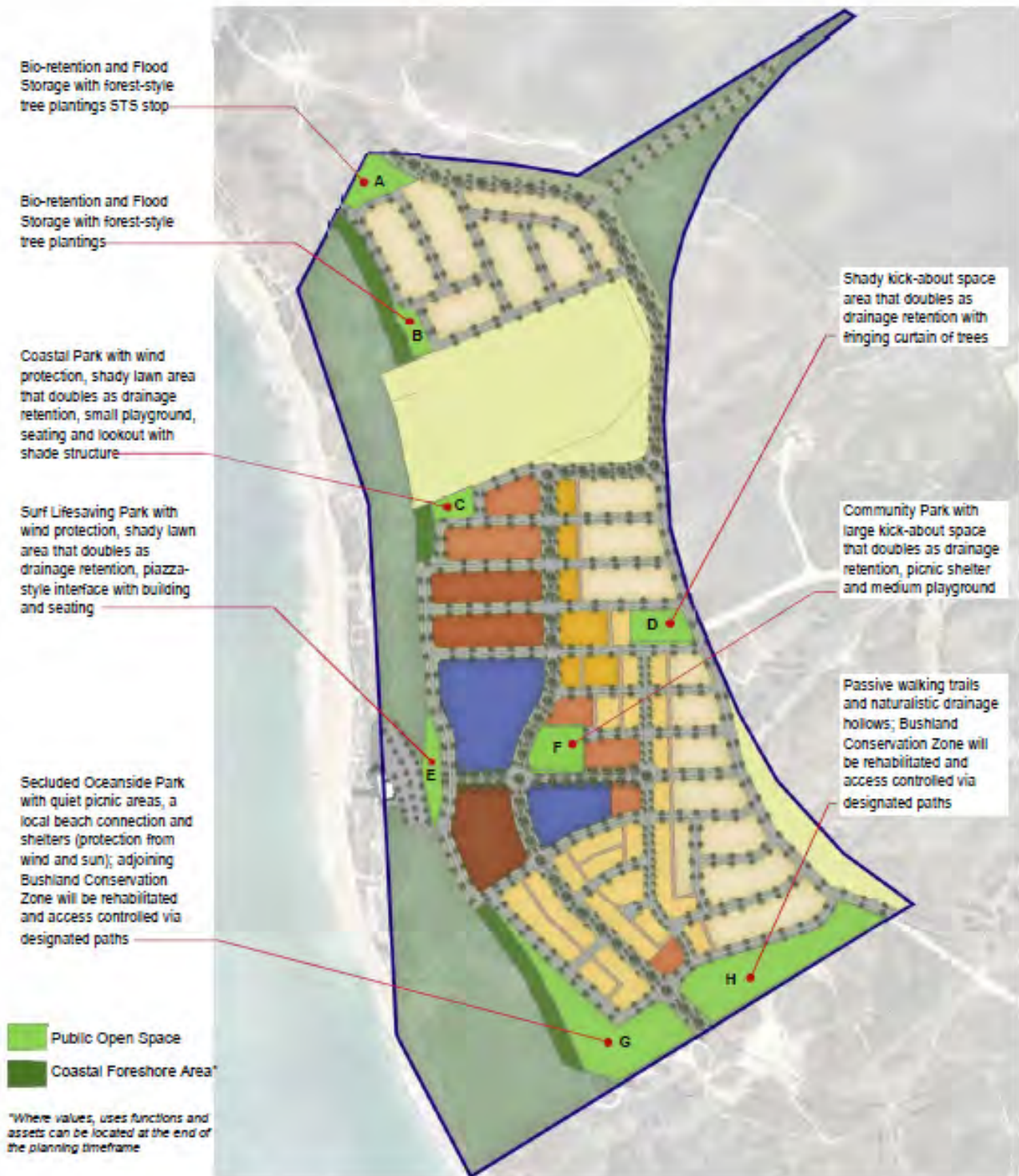
Coastal Park – local pocket sized park accessible from the linear open space pedestrian trail along the foreshore to provide the community with a walking experience through an undulating landform.

Figure 26: Coastal Park



Drainage Parks (general) – designed with 1:1, 1:5 and 1:100 year Average Recurrence Interval (ARI) flood storage areas (FSAs) integrated into parkland design. Side slopes to the FSAs will be at gradient of 1 in 8 side slopes and the 100 year ARI flood event will be retained within 1.2m (maximum) deep flood storage areas within the low point of the parkland.

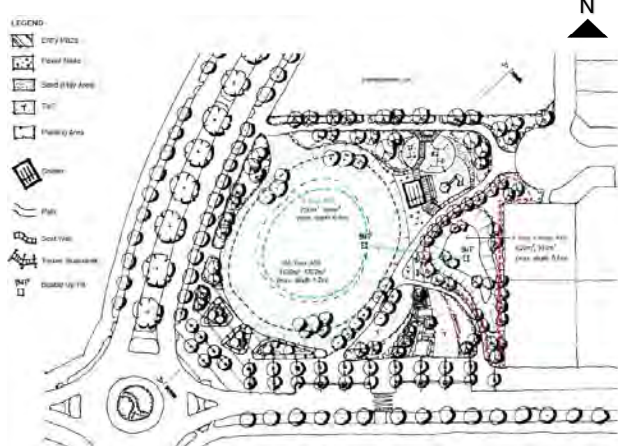
Figure 25: Park Overview



Minor rainfall event discharges into parks will be managed in bio-retention areas separated from the recreation spaces or managed at source where possible.

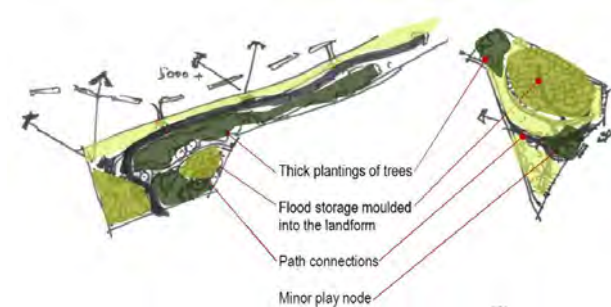
Local Drainage Park – Builds in ecological functions that showcase water sensitive urban design features to treat stormwater and improve surrounding greenery. Flood storage will be integrated with areas of tree-fringed and sunken turf that can accommodate kick-about activities and nature based play.

Figure 27: Local Drainage Park



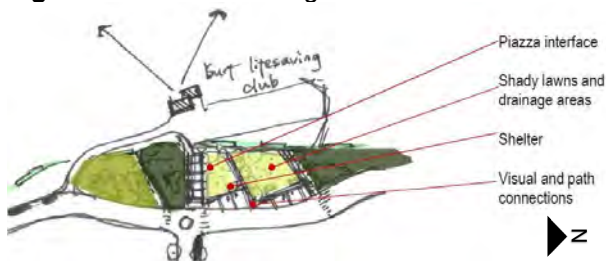
Eco-Drainage Park – features flood storage that is ‘moulded’ into the parkland together with habitat style planting to encourage small native fauna to establish homes.

Figure 28: Eco-Drainage Park



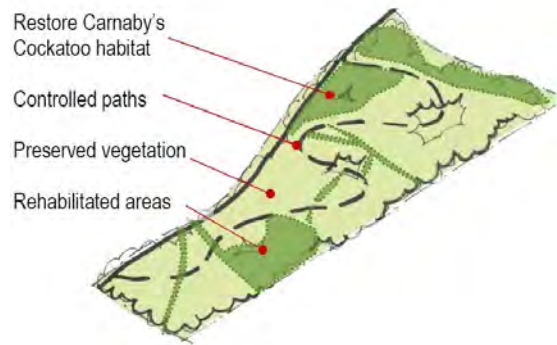
Surf Lifesaving Park – preserves landform and vegetation that is enhanced by rehabilitation of prior tracks and erosion. The area will be fenced to control access to designated informal access pathways. Existing landform will be preserved including dunes and swales.

Figure 29: Surf Lifesaving Park



Bushland Park – preserved landform and vegetation that is enhanced by rehabilitation of prior tracks and erosion. The area will be fenced to control access to designated informal access pathways. Existing landform will be preserved including dunes and swales. Third party access, weeds, dieback and fire prevention will be managed under an approved management plan.

Figure 30: Bushland Park



7.8.5 Vegetation and Landform Retention

The ACVLSP area contains isolated groupings of naturally occurring Tuart trees as well as pockets of potential Carnaby’s Cockatoo foraging habitat. Dunal forms also characterise the site in its present state.

Areas of potential Carnaby’s Cockatoo foraging habitat will be preserved within some of the ‘Parks and Recreation’ and ‘Public Purpose’ reserved areas.

Where feasible, micro-dunal landforms representing the existing site will be either conserved or re-made within some open spaces as styled berms, planted with belts of trees and sometimes accompanied by drainage hollows. These features will provide shelter from strong coastal winds and help to re-establish a sense of place and connection between the coastal landscape and the community.

Figure 31: Example dune-styled berms planted with a ‘shelter-belt’ of trees and shrubs.



7.9 Urban Water Management

A Local Water Management Strategy (LWMS) for the Alkimos Coastal Village (**Appendix 10** refers) has been developed in accordance with Better Urban Water Management Guidelines (WAPC 2008a), State Planning Policy 2.9 *Water Resources* (WAPC 2006) and Planning Bulletin 92 *Urban Water Management* (WAPC 2008b).

Water will be managed using an integrated water cycle management approach, which has been developed using the philosophies and design approaches described in the Stormwater Management Manual for Western Australia (DoW 2007a).

The first step in applying integrated water cycle management in urban catchments is to establish agreed environmental values for receiving waters and their ecosystems. Characteristics of both the existing and past environment within the site have been investigated. In summary, the environmental investigations conducted to date indicate that:

- The site receives 625mm of average annual rainfall with the majority of rainfall received in June, July and August.
- The site is highly undulating and ranges from 5m AHD to 40m AHD in elevation.
- The soil types are consistent with the Quindalup dunal system comprising of sand and limestone.
- ASS risk maps classify the entire site as having no known risk of encountering ASS within 3m of the surface.
- Vegetation across the site is thick coastal bush with occasional larger trees ranging in condition from “Completely Degraded” to “Very Good-Good”.
- The *Geomorphic Wetlands of the Swan Coastal Plain* dataset indicates that there are no wetlands within the site.
- Surface water is largely retained within the site due to the high permeability of the underlying sands.
- Surface water quality monitoring has not been possible due to there being no defined surface water bodies within the site.
- The site is partially located within a Priority 3 PDWSA.
- Groundwater underlying the site flows towards the Indian Ocean to the west.
- Given the groundwater elevations and the minimum site elevations the minimum clearance to groundwater will be 4m, however for the majority of the site it will be >10 m.
- Groundwater quality is relatively consistent across the site.

The overall objective for integrated water cycle management for residential developments is to minimise pollution and maintain an appropriate water balance. The Alkimos Coastal Village LWMS design objectives seek to deliver best practice outcomes using a WSUD approach, including detailed management approaches for:

- Potable water consumption;
- Flood mitigation;
- Stormwater quality management; and

- Groundwater management.

The criteria proposed within the LWMS is based on the characteristics of the existing environment and a contemporary best-practice approach to integrated water cycle management. The overall approach to water conservation is to reduce the amount of scheme water required within the development at both a lot and at an estate scale.

Water conservation measures proposed include fit-for-purpose water sources, including groundwater for POS and temporary road verge irrigation, scheme water for potable uses within lots and harvested rainwater for irrigation of private lot gardens and to supplement potable water use within dwellings (where implemented). Within the lot, scheme water use may be reduced by rainwater tanks, water efficient fittings and appliances, and waterwise gardens/landscaping.

On an estate scale water will be reduced by use of waterwise landscaping practices including use of native vegetation. Irrigation requirements within POS areas are consistent with the provisions within the Department of Water and Environmental Regulation (DWER) North West Growth Corridor (NWGC) licensing schedule and guidelines (DoW 2013).

Stormwater management focuses on stormwater runoff quantity and quality. The principle behind the stormwater management strategy for the ACVLSP area is to maintain the existing hydrology by retaining surface flows and to infiltrate the stormwater runoff as close to source as possible. All runoff up to the 100 year ARI event will be retained within the site. Some of the large development sites may require an integrated drainage solution for events up to 100 year ARI.

The small rainfall event (first 15mm) will be retained as close to source as possible using a combination of soakwells and bio-retention areas within POS. Runoff from events greater than the small rainfall event will be conveyed downstream via surface flow and the road network to verge swales (in some catchments) and ultimately flood storage areas within POS where it will infiltrate to groundwater. Stormwater quality will be addressed using a treatment train approach, utilising the storage provisions discussed above.

Depth to groundwater across the site is significant and groundwater level management measures are therefore somewhat passive and the focus of groundwater management is on water quality.

Groundwater quality will be managed by managing nutrient inputs within surface runoff, and will aim to ensure that groundwater leaving the site is ideally better than existing conditions. Measures to address groundwater quality are consistent with those proposed for stormwater quality.

8 INFRASTRUCTURE CO-ORDINATION & SERVICING

8.1 Roads

The existing road access via the Marmion Avenue and proposed development roads through Alkimos Beach and Shorehaven Estates will provide road access with the external arterial road system being progressively updated to accommodate the expected regional traffic demand.

8.1.1 Regional Roads

Marmion Avenue is complete to a first stage rural standard arterial road between Butler and Yanchep and the LSP area is a party to the agreement through DevelopmentWA with Capricorn Village Joint Venture for repayment of the proportional share of the stage 1 road construction on agreed terms. The construction of the stage 1 road extension was completed in November 2008.

Main Road WA propose to extend the Mitchell Freeway from Hester Avenue to Romeo Road (including the construction of Romeo Road between the Freeway and Marmion Avenue) by 2022.

On this basis, Marmion Avenue will be required to provide a regional road access function for the development of the ACVLSP land until the freeway is further extended in the longer term and access to the freeway via Romeo Road will ultimately become the second region linkage. Marmion Avenue therefore in the interim provides the only direct primary distributor function in the absence of the freeway.

There are no district distributor roads within the ACVLSP and no roads which will exceed 20,000 vehicles per day. Hence there should be no roads for which State Planning Policy 5.4 Noise Considerations will need to be applied.

8.1.2 Development Roads

The ACVLSP comprises a network of development roads including; Integrator Arterial (B), Neighbourhood Connector and local access roads and laneways.

The ACVLSP includes an urban design hierarchy for the development roads, which is an expansion of the traffic hierarchy, to better reflect the intended functions of the roads and their corresponding streetscape characters. Typical road cross-sections are documented in the traffic report.

In all cases the road cross-sections will be designed to cater for utility services, street trees, parking embayments, etc. as required.

The engineering design of roads will be carried out to comply with the Department of Planning, Lands and Heritage *Liveable Neighbourhoods* recommendations and with the requirements of the City of Wanneroo, Main Roads WA and other relevant Australian Standards where applicable.

In particular, it is proposed that the development roads be designed to suit lower vehicle operating speeds to ensure safer operation and to provide more flexibility to better follow the existing topography with road alignments and grades.

The lower speeds on local roads will also support Initiatives to adopt smaller street truncations and associated intersection curve radii.

The ACVLSP includes some short sections of development roads located adjacent to the boundary of the dunes and Regional Open Space network. The existing topography along these sections is such that to achieve appropriate road alignment it may be necessary to extend the road earthworks batters into parts of the reserve. The extent of this would be minimised as an objective of the road design and would be detailed through relevant engineering approval processes.

Initial road access to the site will need to be via extension of roads from Shorehaven, or one of DevelopmentWA's land holdings Alkimos Beach to the south or from the Central Alkimos LSP area to the north. Ultimately there are four public roads (two in the north and two in the south) which link the ACNSP to the broader Alkimos area. The two access roads to the north require the roads to be constructed across the land designated Parks and Recreation and Bush Forever on the Metropolitan Region Scheme. These roads are documented on the Alkimos Eglinton District Structure Plan, consideration will need to be given to minimising the impact of cut and fill batters from the roads at the detailed design and construction stage.

Funding for the construction of these roads needs to be resolved between the adjacent development entities. The road connection to the northwest through Shorehaven provides the connection from the ACVLSP for the planned Secondary Public Transport System, which we understand we take the form of a high frequency bus service.

8.2 Sewerage

Waste water service can be provided through the provision of permanent waste water pump stations to link the sewer flow from individual sites to the Quinns Main sewer and Alkimos Waste Water Treatment Plant consistent with WC waste water scheme planning.

8.3 Drainage and Stormwater Management

The site is generally free draining with no low-lying areas or defined watercourses. The existing limestone and sandy ground is permeable and the depth from the natural surface to groundwater is relatively significant.

Overall, therefore, the land is highly suited to the implementation of the WSUD management practices outlined above.

In residential areas, it is anticipated that runoff will be contained within the lots. Stormwater disposal will be via soakwells or other infiltration facilities which form a part of the building and private open space development. In areas of higher urban density, allowance has been made in the stormwater model to manage a proportion of the runoff in the council controlled street drainage network. This provides a more practical response for higher density sites and allows the runoff from larger storms to be managed away from buildings in areas of public open space.

Drainage from public roads and lanes can be managed in a number of ways depending on the nature of the adjacent land uses, the extent of traffic and pedestrians and the objectives for drainage management.

It is proposed to adopt the WSUD approach recommended by the Department of Water Environment and Regulation to improve overall environmental outcomes. DWER's target of infiltrating small events run off (first 15mm) (dispersed throughout the drainage catchments) may be difficult to economically achieve throughout the catchment where there are highly urbanised roads. As a consequence, runoff will likely be conveyed to the local low points where stormwater runoff infiltration areas will be co-located with areas of public open space. Stormwater runoff will soak efficiently into the ground and return a significant proportion of the runoff to the unconfined aquifer.

Infiltration could also be via swales within or adjacent to road reserves, via slotted drainage pipes, porous road pavements, under road storages etc. subject to the City of Wanneroo approval and consideration of whole of life costs including the ongoing maintenance.

Runoff from storms up to 1 in 5 years ARI would be conveyed in an underground pipe system to low point infiltration basins consistent with the requirements of the City of Wanneroo.

Roads and POS would be designed to cater for the surface overflow for more severe storms with building pads constructed at least 300 millimetres above the 1 in 100 year ARI flood or storage level at any location.

The dispersion of stormwater disposal will maximise the area of recharge down through the soil profile to the shallow aquifer, thereby, maximising the potential for nutrient stripping and water quality improvements.

The LWMS prepared by Emerge details the stormwater drainage plan for the ACNSP. The plan shows the approximate location of stormwater disposal sites based on a preliminary assessment of finished development levels. As indicated in Section 3 the preliminary assessment has been based on road alignments and grades reflecting the existing topography as far as practical. This approach results in a number of 'low points' throughout the development area which will need to be designed, with drainage infiltration sites and flood storage areas to accommodate runoff for up to 100 year ARI storm events.

The LWMS also includes tabulated data for areas required at each low point infiltration swale to cater for the small event, minor event (1 in 5 year ARI) and major event (1 in 100 year ARI) storms.

8.4 Power

It is expected, initially, the local network will be incrementally extended through Alkimos Beach from south east of the ACVLSP and from further south in Eden Beach and north from Shorehaven.

A series of HV feeds, switch stations and transformers will be required throughout the ACVLSP to meet individual site requirements, large high density residential, commercial and public purposes sites (such as school sites) usually require a direct HV feed and have a sole use transformer to meet their power requirements. At subdivision it is likely these sites will be provided with access to a HV feed only and will install a transformer at building stage after the power demand is better understood through building design.

Depending on the actual power demands per dwelling experienced in Alkimos - Eglinton and the rate of development, Western Power expects the new Eglinton zone substation (proposed in the Alkimos District Structure Plan to be south of Eglinton Drive and between the Railway reserve and the Mitchell Freeway reserve) to be required in approximately year 2021.

8.5 Telecommunications

Telstra has an existing exchange building adjacent to Marmion Avenue approximately four kilometres south of Alkimos. Telstra and now the National Broadband Network (NBN) has been providing fibre to the home services for Butler (Brighton) and other developments in the Alkimos Eglinton area. Alkimos Beach (Lend Lease / LandCop) has chosen to proceed with a private telecommunications provider, in Opticomm providing a similar service standard.

It is understood Telstra / NBN is currently the provider for the Shorehaven development north of the Central Alkimos LSP area.

8.6 Gas

The existing high pressure gas network has been extended from Butler to Yanchep by the gas supply operator, Atco. The same gas network extension has provided branch service connection to the Shorehaven development, Amberton (Eglinton) development to the north and Alkimos Beach to the south. Atco the gas service provider has indicated the high pressure main installed in Marmion Avenue will have capacity for all development in the Butler, Jindalee, Alkimos and Eglinton area.

In general terms it is expected the gas reticulation network will be progressively extended from Marmion Avenue through Alkimos Beach and linked north and south into the adjoining developments as they proceed. There are not expected to be any gas supply capacity issues.

8.7 Water Supply

8.7.1 Water Resources

The ACVLSP is located within the Water Corporation's future Eglinton ground water source area for potable water supply. Provision has been made for some time for the development of this ground water resource.

Water supply to the ACVLSP area will ultimately be via a series of groundwater bores, located throughout the Alkimos-Eglinton area, linked by collector water main's to a central treatment plant and reservoir. Areas of urban development will be serviced by a network of distribution water mains, from the reservoir, connected to reticulation systems within those areas.

8.7.2 Water Supply Network

Supply to ACVLSP will be via extension of the reticulation network from Alkimos Beach (250mm diameter pipe) and linked north through to Shorehaven with the same size main. The reticulation network in Alkimos Beach receives its supply via the existing 700mm diameter trunk water main in Marmion Avenue.

There are no trunk or headworks size water supply mains proposed in ACVLSP area.

8.8 Site Works

8.8.1 General Site Works

Siteworks for urban development typically comprises the identification of areas of vegetation for conservation, protecting these areas (during and after construction) and in areas for commercial and

residential development clearing of the existing vegetation to receive the built form and, where necessary, the earthworking of the existing ground to accommodate the required form of development.

In Perth it is often the case that the extent of siteworks is dictated by the density and nature of development and by the finished ground shape required for building houses, commercial buildings etc. Increased densities and decreasing lot sizes has led to a current trend for the development areas to be fully earthworked to create level lots which are terraced between retaining walls.

This approach has provided a number of positive outcomes in the past including:

- Reduction of total building cost;
- Rationalisation of retaining wall layouts and design consistent with Local Authority specifications; and
- Enables lots to be terraced up natural slopes to maintain elevation and views while providing certainty between boundaries.

This approach assumes the home builder or commercial builder is unable to manage the level changes between allotments across each site within or around the building itself. DevelopmentWA is currently trialling leaving the building sites graded at Alkimos Beach west of Marmion Avenue with their joint venture partner Lend Lease, if this method is successful it may be transferred to the Alkimos Coastal Village, meaning the sites will be left graded without retaining walls where the market and built form is able to manage these finished levels. In other areas retaining walls may be necessary to ensure the individual home sites maximise their potential for ocean views. The detail for these responses will be resolved at subdivision stage.

8.8.2 Siteworks Controls

There are a number of factors which need to be considered in reviewing the finished levels of the development of the ACVLSP. These are summarised as follows:

- The parabolic dune which is located to the north and south of the site will need to be accommodated in the earthworks design concept if significant dune retention at the boundary is to be achieved.
- Finished development levels within the LSP area are largely independent of the adjoining developments. However, the design of linking roads will need to match those of the adjoining development land to the north, the Shorehaven Development by Peet and south east Alkimos Beach by Lend Lease / DevelopmentWA. A close liaison will need to be maintained therefore, with the developers of the land and their consultants to ensure the adopted designs of the linking roads maintain the least practical

disturbance of the dune and green spaces through which they traverse.

- The eastern boundary is fixed by the extension of the Foreshore reserve linking across to the Conservation area protecting the dune and surrounding the Waste Water Treatment Plant.
- The western boundary is fixed by the Foreshore reserve and the associated constraints of the coastal processes line, refer to separate advice prepared by Essential Environmental.
- Siteworks within the Alkimos area may be subject to further investigation surveys for Unexploded Ordnance (UXO), in accordance with DFES requirements. However, DFES advice suggests that sufficient surveys have now been completed for Alkimos, without any high explosive finds which would require further searching.

8.8.3 Proposed Siteworks

The ACVLSP has been designed in accordance with the following objectives:

- To maximise the preservation of the significant topographic features in specific conservation public open space areas, namely the dune linkages forming the southern and northern limits of the LSP area;
- To allow for roads and development sites to be graded to follow the existing topography where possible and to best reflect the coastal landscape; and
- To minimise intrusion into the Alkimos Waste Water Treatment Plant site and not direct stormwater runoff into the WWTP site, but rather to be accommodated in drainage swales in areas of local public open space.

9 IMPLEMENTATION

9.1 Metropolitan Region Scheme Amendment

An amendment to the MRS is needed to:

- implement the proposed changes to the Parks and Recreation reserve to accommodate a sea level change allowance pursuant to SPP 2.6 requirements for coastal developments to allow for 0.9m sea level rise over a 100 year planning horizon; and to correct anomalies associated with Bush Forever boundaries not corresponding with the boundary of the Foreshore Reserve (refer Plan 1, notations 1 and 2); and
- increase the area of Public Purpose reservation to facilitate Water Corporation's future operational needs (refer Plan 1, notation 1).

9.2 Amendment to Local Planning Scheme

- Once approved, in order to have the force and effect of a Scheme, the Structure Plan is to be incorporated into the City of Wanneroo's District Planning Scheme No.2 (or equivalent at the time of approval) via a Scheme Amendment or as part of a Scheme review.
- Incorporation of structure plans into planning schemes can be undertaken when the Structure Plan implementation has progressed to such a stage that the boundaries of the proposed zonings are set and are not going to be changed.
- Proposal to introduce new zones, rezone land and / or introduce additional provisions into a scheme, to reflect structure plan requirement, are to be undertaken as a standard amendment.

9.3 Amendment to adjacent Local Structure Plan

As noted in Section 1.2.2, a portion of conservation POS 'B', as annotated on Plan 1 of the South Alkimos LSP, is also included within the ACVLSP area. Given this land is included within the ACVLSP, an amendment may be required to the South Alkimos LSP.

9.4 Development Contributions

The LSP area forms part of Alkimos Eglinton Development Contributions Area DCA (1) for which development contributions are required pursuant to Clause 5.4 of the Scheme.

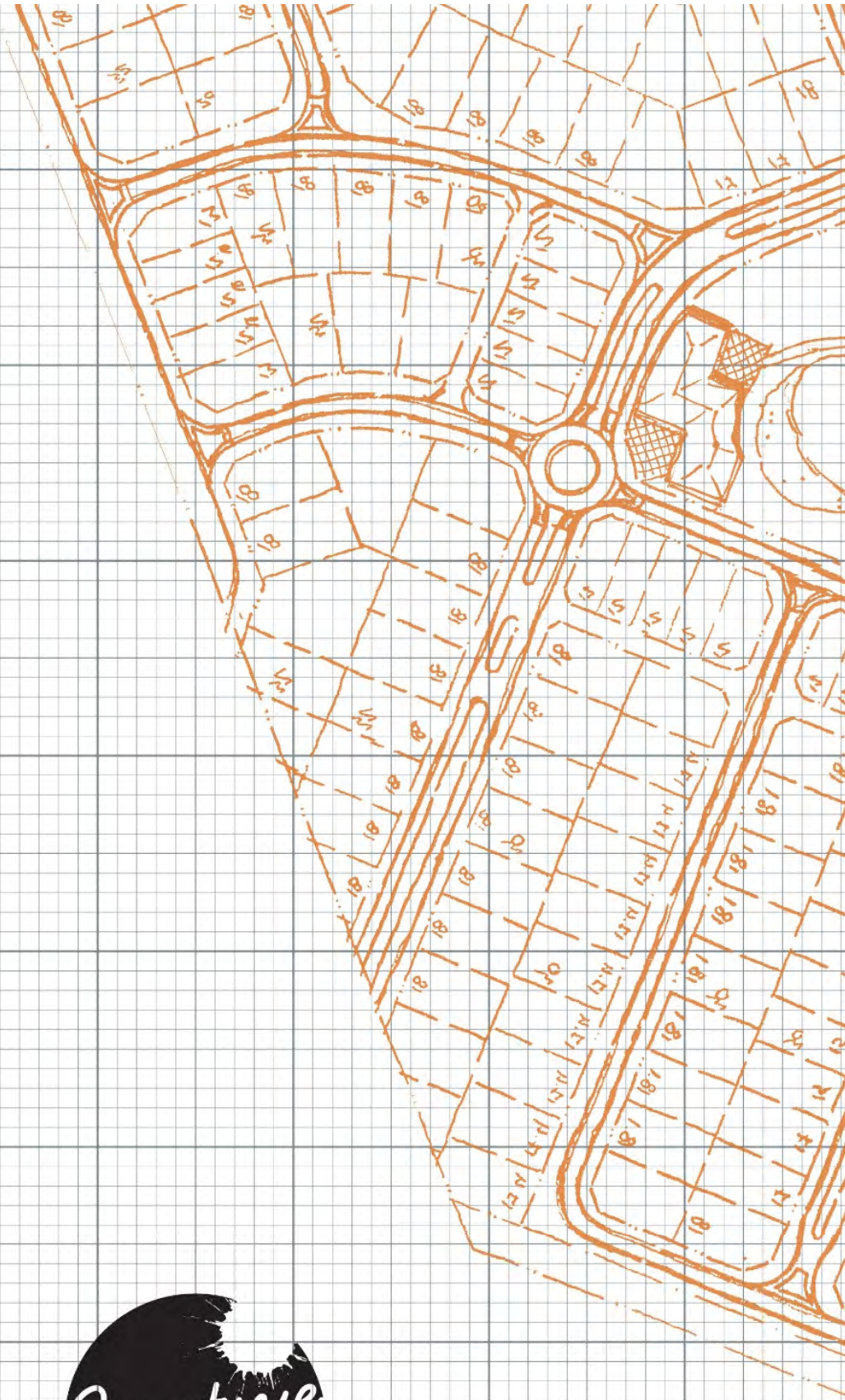
Schedule 15 *Development Contribution Plan* of the Scheme lists community facilities, infrastructure and administrative items towards which contribution is required.

The Alkimos Eglinton Development Contribution Plan was gazetted into the Scheme on 9 September 2014, to provide for the equitable sharing of the costs of infrastructure and administrative costs between owners. The DCP generally conforms to the AEDSP, the *Northern Coastal Growth Corridor Community Facilities Plan* and the City of Wanneroo's Long Term Financial Plan 2013/14 – 2022/23.

9.5 Staging

The development of the Alkimos Coastal Village will be implemented in stages, over a period of time the duration of which will be dependent on the demand for residential housing and the services and facilities associated with it.

The provision of engineering infrastructure will need to be staged to suit the development demand and a detailed program for this will need to be prepared as part of ongoing detailed planning and design of the infrastructure.



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