emerge ASSOCIATES
Integrated Science & Design

# FORESHORE MANAGEMENT PLAN

## AMBERTON ESTATE

Project Number EP12-032

**Prepared for Stockland**
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# Executive Summary

Stockland and Eglinton Estates are joint venture partners in developing the Amberton Estate, a residential development in Eglinton, which includes approximately 700 metres (m) of coastal frontage within the City of Wanneroo. Stockland engaged Emerge Associates to prepare a foreshore management plan to guide the planning, development, rehabilitation and long term management of the Amberton coastal foreshore area.

This Amberton Foreshore Management Plan (FMP) specifically deals with an area referred to within this document as the Amberton "foreshore reserve". The foreshore reserve incorporates a "Parks and Recreation" reserve and areas of Public Open Space (POS) (zoned "urban" under the Metropolitan Region Scheme (MRS)), the latter which were located under the Eglinton Local Structure Plan (LSP), to ensure that an adequate foreshore reserve was provided in accordance with *State Coastal Planning Policy 2.6* (SCPP).

Amberton and the Eglinton area have had an extensive planning history, including two historic Ministerial Statements, MRS amendments, the Alkimos Eglinton District Structure Plan (DSP) and most recently the Eglinton Local Structure Plan (LSP). The endorsed LSP formally established the spatial extent of the foreshore reserve, to ensure that any proposed residential development, including a foreshore road, were located landward of the determined coastal processes setback. Both the DSP and LSP identify two local coastal nodes within the Amberton estate. The preparation and implementation of this FMP addresses a number of planning and existing approval requirements.

The overarching vision for the foreshore reserve is to establish an area that retains and protects coastal landforms and vegetation, and provides an amenable and useable system of open space which encourages outdoor activity and interaction with nature, the outdoors and most importantly the coast. The foreshore management principles focus on maintaining the condition of the foreshore while providing for increased usage, coastal access and amenities to compliment residential development of the adjacent Amberton site. The overall design approach aims to balance the needs for coastline stabilisation, coastal processes and weather conditions, foreshore restoration and controlled human activity, including informal active and passive recreation linked to community benefit, education and appreciation, and acknowledges Amberton's status as a 'local beach'.

As part of the preparation for this management plan a review of the historic planning and environmental investigations that have been completed for the site and surrounding areas, coupled with detailed site specific inspections and investigations, were undertaken to determine the opportunities and constraints presented by the site. Parts of the Amberton foreshore reserve have historically been significantly disturbed through dune blowouts, the results of which provide an opportunity to locate future passive recreation and amenity areas without requiring the clearing of native vegetation or disturbance of the natural foreshore dunal landform. These blowout areas are positioned in the northern and southern regions of the foreshore reserve, while the central portion contains relatively intact remnant vegetation which is proposed to be protected through generally avoiding any construction and clearing in these areas, restricting access, and the proposed provision of boardwalks and paths located on existing tracks to access the foreshore reserve.

This FMP has considered these opportunities and constraints to present a foreshore master plan that provides controlled access to the coast, with recreation opportunities and strategic lookouts to incorporate coastal views. The southern coastal node (café node) has been located within a highly degraded area and will provide recreational amenity for the local community. The development of this Amberton FMP has been supported by a Surf Life Saving Western Australia (SLSWA) Coastal Aquatic

Risk Assessment (CARA) which has provided recommendations on the most appropriate location for a swimming beach.

Management of the foreshore and the proposed development of the Amberton foreshore reserve are discussed in **Section 7**, which provides information on:

- Construction management
- Interface management
- Rehabilitation/ecological restoration of historic disturbance
- Fauna management
- Water management and Water Sensitive Urban Design (WSUD)
- Access
- Beaches
- Foreshore reserve amenities and structures
- Bushfire management
- Staging.

In accordance with the SCPP, this FMP is also supported by a Coastal Hazard Risk Management Adaptation Plan (CHRMAP) to consider the potential impacts to assets and infrastructure within the foreshore reserve over the SCPP planning timeframe. To progress the CHRMAP, assets and infrastructure have been considered against three planning timescales (30, 50 and 75 years) and management strategies have been considered in accordance with the coastal adaptation hierarchy (SCPP 2013).

In accordance with the SCPP, the majority of coastal assets have been located behind (landward of) the 30 year coastal processes setback and as such generally meet the requirements as a "variation" to the SCPP. Beyond this timeframe, the general approach has been to allow for planned or managed retreat of assets and infrastructure which will allow these structures to be removed at the end of their life span, with options for relocation where relevant. In addition to this detailed discussion have been undertaken with the City of Wanneroo as to their level of comfort in terms of assets within foreshore reserve areas.

This FMP is for the endorsement of the proposed assets and infrastructure within the Amberton foreshore area as delineated in the foreshore master plan. The subdivision east of the foreshore area is subject to a separate planning approval. Endorsement of this FMP does not include the areas outside of the Amberton foreshore area. Following endorsement and approval of this FMP by the City of Wanneroo and the Western Australian Planning Commission (WAPC), Stockland will submit detailed development applications and/or landscape approvals as required to the relevant authorities. The relevant applications and subsequent assessment will be guided by the FMP which sets the framework and expectations for how the foreshore reserve will be treated through the subdivision and development process.

Stockland and the City of Wanneroo acknowledges that this FMP is conceptual and that the detailed design of all prescribed assets and infrastructure will occur during the development application stage. Stockland recognises that should the City of Wanneroo determine that they do not have the capacity to maintain and manage a proposed asset then the City reserves the right to require the application to show this accordingly.

The proposed playground and all other public amenities including but not limited to applications for play equipment, exercise equipment, outdoor furniture, shelters, structures, BBQ's, drinking fountains and public art will satisfy the following criteria:

- Maintenance thereof is to be within the City's operating budget;
- Replacement thereof is to be within the City's capital works budget;
- Compliance thereof with the Australian Standards and City's safety standards;
- The scale of the playground is to be appropriate to the size of park it is proposed in; and
- The playground provides opportunity for physical and creative play and accommodates for different age groups.

Notwithstanding the above, this FMP is based on extensive discussions over almost two years between Stockland and the City and any decision to deviate from the FMP framework should not be made lightly and without reasonable justification by either party.

The developer will implement this FMP as specified and monitor and maintain the foreshore for a minimum period of five years in accordance with the SCPP. Following this, the foreshore reserve will be handed over to the City of Wanneroo for ongoing maintenance and management.

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# 1 Introduction

## 1.1 Project background

Amberton Estate (Amberton) is situated along the north Alkimos coastline, 46 km north of Perth Central Business District (CBD). The entire Amberton site is approximately 198 hectares (ha) with a coastal frontage of approximately 700 metres (m). Shorehaven, which is currently being developed by Peet Limited is situated immediately to the south, with Eglinton Estates land to the north.

A marina and coastal village is proposed north of the site, which will be subject to additional detailed planning and a separate approvals process. As the marina development is not expected to commence for a number of years, temporary foreshore works may also be required within the marina site in order to provide safe access to the coast for future residents.

This Foreshore Management Plan (FMP) has been prepared to guide the planning, development, rehabilitation and long term management of the an area referred to as the Amberton 'foreshore reserve', as established under Eglinton Local Structure Plan No. 82 (LSP) (see **Figure 1**). The foreshore reserve includes areas both reserved for "Parks and Recreation" and zoned "Urban" as shown in **Figure 2**.

## 1.2 Purpose of this document

Stockland engaged Emerge Associates (Emerge) to support the preparation of the foreshore master plan and relevant supporting documentation comprising this plan.

This FMP document:

- Provides guidance for the future development and management of the Amberton foreshore reserve.
- Establishes a management framework that will enable the foreshore reserve to be managed in a sustainable manner providing access and amenity to local residents and the wider local community.
- Outlines the management of the interface between the foreshore and the development area.
- Defines acceptable uses, facilities and structures within the foreshore reserve.
- Makes commitments regarding future revegetation and the extent of conservation activities.

The focus of this FMP is primarily the Amberton foreshore reserve, however it has considered a broader area including the area of foreshore immediately north of Amberton associated with the future development of land owned by Eglinton Estates.

## 1.3 Objectives

The FMP for Amberton has been guided by a number of design principles. These design principles follow four key themes for the development of the estate;

- Being site responsive
- Providing strong community building
- Being connected and accessible
- Providing leading built environment.

The relevant design principles associated with the key themes are detailed below:

- Site Responsive
  - Respect the complex coastal ecologies the site represents.
  - Consider natural attributes of the existing topography when determining urban structure and place making.
  - Consider location of recreational facilities to take advantage of sheltered low lying areas on the leeward side of existing dunes.
  - Panoramic views to be a design consideration.
  - Design to accommodate areas of vegetation and dunal landform identified for retention.
  - Where possible retained areas should be available for multiple use (public access, public use, conservation, flood storage).
  - Foreshore reserves to include recreational uses, public access, parking and food storage.
  - Where possible, environmental and landform elements selected for retention to form part of credited public open space.
- Strong Community Building
  - Where appropriate, celebrate high points with built form and select vantage points.
  - Co-locate facilities to maximize place making, economic benefits and design efficiencies.
  - Integrate public open space with the coastal foreshore reserve to facilitate and enhance public use.
- Connected and Accessible
  - Pedestrian and cycle network to offer a variety of choices linking the community to local landmarks, public art, landscape elements, community infrastructure and neighbouring communities.
  - Links to facilitate important east-west non-vehicular connectivity/routes from the coast to freeway as well as due consideration to north-south connectivity axis. Due consideration to be given in promoting these routes in providing the required linkages with the rest of Amberton and into neighbouring landholdings.
- Leading Built Environment
  - Locate and design for built environment to support unique place creation and identity.

In addition, a specific vision has been identified for the Amberton FMP being:

- Identify the natural resources and processes as well as the necessary management measures for preserving and enhancing the environmental values of the foreshore reserve.
- Identify and provide for sustainable levels of leisure, recreation, commercial and general public infrastructure necessary for the planned population growth in the surrounding area.
- Identify and provide opportunities for interpretive facilities consistent with the environmental and cultural values of the area.
- Develop an implementation plan for future development works and management within the foreshore reserve, which outlines priorities, responsibilities and an indication of the likely costs for each action.

## 1.4 Assessment and implementation of this FMP

This FMP will require endorsement by both the City of Wanneroo and the Western Australian Planning Commission (WAPC). While it provides a clear framework and guidance for the future development and management of the foreshore reserve, separate development approval will be required prior to the implementation of various aspects of the foreshore works. This FMP is for the endorsement of the

proposed assets and infrastructure within the Amberton foreshore area as delineated in the foreshore master plan. The subdivision east of the foreshore area is subject to a separate planning approval. Endorsement of this FMP does not include the areas outside of the Amberton foreshore area.

For the implementation of any works within the MRS Parks and Recreation reserve, development approval will be required from both the WAPC and the City of Wanneroo, while the land is under the ownership of the developer. This would involve a development application for the implementation of foreshore works. When the foreshore reserve is transferred to the Crown and a management order exists with the City of Wanneroo, planning (development application) approval is only required from the City of Wanneroo.

For any implementation of works within the Amberton foreshore reserve outside of the Parks and Recreation reserve, approval will be the same process as for standard areas of Public Open Space (POS) within residential development within the City of Wanneroo. Landscape detailed design will be submitted directly to the City of Wanneroo for approval prior to any implementation of works.

## 1.5 Land details

The Amberton foreshore reserve is located within Lot 9005 Pipidinny Road, Reserve 20561 and Unallocated Crown Land within Eglinton (see **Figure 1**).

The land reserved for Parks and Recreation includes freehold land (Lot 9005 Pipidinny Road), Reserve 20561 and Unallocated Crown Land. The Department of Planning (DoP) is currently the responsible authority for Reserve 20651, however there is a management order with the City of Wanneroo.

The areas reserved for Parks and Recreation under the MRS are also recognised as Parks and Recreation reserves under the City of Wanneroo Town Planning Scheme No. 2 (TPS No. 2), with a portion of the foreshore reserve within Lot 9005 Pipidinny Road zoned for "Urban Development" which corresponds with the area zoned Urban under the MRS.

Areas reserved for Parks and Recreation are also part of Bush Forever Site 397 – *Coastal strip from Wilbinga to Mindarie* (Government of WA 2000).

# 2 Statutory Framework and Policy Requirements

Any future management framework proposed for the foreshore reserve will need to be cognisant of the relevant prevailing legislation and policy requirements. The key legislation, policy and guidelines that are relevant to the design approach and management of the Amberton foreshore reserve are outlined in the following section.

### 2.1.1 State Planning Policies

#### *2.1.1.1 SPP 2.6 State Coastal Planning Policy*

The most relevant State Planning Policy associated with the Amberton foreshore reserve is the *State Coastal Planning Policy 2.6* (SCPP). The (SCPP) was introduced in 2003 and provides guidance for the siting of new development including subdivision and strata subdivision along the coast. The objectives of the policy are to:

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

A revised version of the SCPP and new accompanying guidelines were finalised and released in July 2013 following a review of the original policy to take into account the latest coastal planning information locally, nationally and internationally in addition to learnings from over 10 years of policy application. This FMP has taken this policy into consideration and is based on the current version of the policy.

The SCPP provides guidance on calculating the component of the coastal foreshore reserve required to accommodate for coastal processes. The relevant coastal processes include erosion, accretion, storm surges, winds, sea level change and biophysical criteria (SCPP 2.6, 2003). A coastal processes assessment was completed for the Eglinton Estates land (including the Amberton foreshore reserve) by M.P. Rogers and Associates in 2011 based upon the 2003 SCPP. This was a key consideration reflected in the extent of the foreshore reserve for the ultimately endorsed Eglinton LSP (**Appendix A**). Other considerations for a coastal foreshore reserve (in accordance with SCPP) include "*the consideration of, and protection for significant natural features such as coastal habitats and, for their biodiversity, archaeological, ethnographic, geological, geo-morphological, visual or wilderness, biodiversity and ecosystem integrity, heritage, landscape, seascape, and visual landscape values…and opportunities for public access, public recreation needs and safety to lives and property.*"

The M.P. Rogers (2011) coastal processes assessment is discussed further in **Section 3.8.**

The 2013 SCPP requires foreshore management plans to consider coastal hazard risk management and adaptation planning. To this end, this FMP includes a Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) to address proposed development within the Amberton foreshore (**Section 10**). The CHRMAP has been incorporated into this FMP as discussed further in **Section 10**.

#### *2.1.1.2 SPP 2.9 Water Resources*

SPP 2.9 aims to ensure the protection and appropriate management of water resources in line with state guidelines is included within the planning framework. The broad aims of this policy are to:

- Protect, conserve and enhance water resources.
- Assist in ensuring the availability of suitable water resources to maintain essential requirements for human and other biological life and to maintain or improve the quality and quantity of water resources.
- Promote and assist in the management and sustainable use of water resources.

The FMP has considered SPP 2.6 in relation to the protection of water resources through revegetation, the proposed stormwater management approach within the foreshore and public open space network and the selection of water efficient species for landscaping.

#### *2.1.1.3 Draft SPP 3.7 Planning for Bushfire Risk Management*

The draft State Planning Policy 3.7 Planning for Bushfire Risk Management (2014) is intended to inform and guide decision makers, referral authorities and proponents to achieve acceptable bushfire protection outcomes, including expectations at the different stages of planning.

In consideration of this, a Bushfire Management Plan has been developed for the Amberton Estate (including the foreshore reserve) and will be used to support future residential development. This application of bushfire management is discussed further in **Section 7.8.**

### 2.1.2 Other state policy and guidelines

#### *2.1.2.1 Bush Forever*

Bush Forever provides a policy and implementation framework to ensure bushland protection and management within the Perth Metropolitan Region (Government of WA 2000). It integrates the environmental values and the protection of specific bushland areas with the economic and social considerations for future development. The policy does not restrict development where it is consistent with the measures in the Bush Forever policy.

The Bush Forever policy is applied through *State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region*.

A large portion of the Amberton foreshore reserve is part of a Bush Forever site, which is consistent with the extent of the Parks and Recreation reservation (see **Figure 2**). This area is identified as Bush Forever Site No. 397 (Coastal Strip from Wilbingia to Mindarie) with remnant vegetation representative of the Quindalup Vegetation Complex.

Given that the Bush Forever site is reserved for Parks and Recreation, the planning and implementation of the FMP needs to be consistent with the Bush Forever Practice Note 14 (Government of Western Australia 2000b). In selecting sites for protection, Bush Forever's starting position was that vegetation in Parks and Recreation reserves was to be regarded as regionally significant and included as protected sites. However, a number of Parks and Recreation reserves may include degraded areas. The Bush Forever Practice Note 14 notes that future recreation, servicing or community objectives may therefore be appropriate in cleared or degraded portions of existing reserved lands forming part of a Bush Forever site.

### 2.1.3 City of Wanneroo policy

#### *2.1.3.1 City of Wanneroo Draft Coastal Management Plan Part 1*

The City of Wanneroo Coastal Management Plan (CMP) is being developed in two parts. Part 1 was completed in May 2011. The purpose of the CMP was to research the pressures the expanding population is having on the Wanneroo coastline, as beaches are being more intensively used. The overview of current changes will allow the City of Wanneroo to implement and manage conservation and recreational coastal areas to meet the needs of the expanding population.

The objectives of this document are to:

- Document existing uses of and facilities included on City of Wanneroo coastal reserves.
- Investigate key community issues and concerns regarding coastal access and use.
- Obtain community feedback on the issues surrounding coastal access and use.

The majority of the Coastal Management Plan is targeted on "Parks and Recreation" reserved land under the MRS.

The Amberton foreshore reserve is identified as being part of the "Eglinton, North Alkimos, South Alkimos-North Jindalee" area. The CMP states there will be a marina and approximately three recreation nodes within Eglinton. Fishing and four wheel driving are identified as presenting management issues within the Eglinton area.

Within this document, a dog beach is acknowledged as occurring to the south of Amberton within North Alkimos (within Shorehaven).

#### *2.1.3.2 City of Wanneroo Local Biodiversity Strategy*

The Local Biodiversity Strategy consists of key strategies and actions which are to be implemented by the City of Wanneroo in order to reduce the loss of natural habitat and maintain or improve biodiversity protection within the Wanneroo local government area. The key strategies identified within the Local Biodiversity Strategy (2011- 2016) to achieve this are:

- Strategy 1: Utilise the WA Planning System to maintain and protect the City's key biodiversity assets.
- Strategy 2: Maintain and enhance biodiversity assets through reserve management.
- Strategy 3: Develop new projects to improve the protection of biodiversity assets.

The City of Wanneroo Alkimos Eglinton Precinct supports of three vegetation complexes, which will be maintained and improved with the implementation of the Biodiversity Strategy by:

- Increasing the protection of natural areas within existing public open space.
- Effectively managing existing public open space for conservation of biodiversity value.
- Where possible, reducing threats to biodiversity.
- Increasing reservation of natural areas in new urban developments to protect up to or a minimum of three percent of the sub divisible area in the overall precinct to protect local natural areas in public open space vested for a purpose that includes conservation.
- Successful application of the District Structure Plan to later planning stages.
- Formalising the requirements of biodiversity protection by updating the City's public open space policy.

The vegetation complex within the foreshore reserve (Quindalup) is identified as a medium priority within the Local Biodiversity Strategy, as current protection of this vegetation complex within the City of Wanneroo is over 10%, but under 30%.

Specifically the Local Biodiversity Strategy recognises the requirement for the City to undertake a strategic assessment of existing coastal reserves and foreshore management plans to ensure a holistic approach to coastal reserve management. This is achieved through a recommendation in the Local Biodiversity Strategy that the City develop a Management Plan for the Coastal Foreshore and/or review the existing management plan, to encourage biodiversity retention and protection whilst also planning for the impact of recreation and a larger number of visitors to the coast, to guide local management plans and future land use. The City's Coastal Management Plan (**Section 2.1.3.1**) has been developed to address this recommendation.

This FMP addresses the key strategies of the Local Biodiversity Strategy by developing a management framework to maintain and enhance the coastal biodiversity assets, including the protection and management of a large area of Quindalup vegetation complex in "Very Good" condition, and revegetation and rehabilitation of "Degraded" and "Completely Degraded" areas.

## 2.2 Historic planning and approvals context

The site and wider Alkimos Eglinton area have been subject to a detailed and extensive planning and environmental approval process over a number of years. The relevant planning and environmental process and approvals for the site are discussed further below.

PGV Environmental provided some of the historic planning information for this section of the FMP and this contribution is acknowledged.

### 2.2.1 Eglinton Beach Proposal Ministerial Statement 150

In 1990, Ocean Dunes Pty Ltd submitted a Public Environmental Review (Assessment 229) for the Eglinton Beach Resort (EBR) proposal to the Environmental Protection Authority (EPA). The proposal was for a recreational resort complex incorporating an eighteen hole links golf course, marina and beach resort and associated residential components that covered an area of 325.28 ha (note the approximate area under the proposal without any reclaimed land is 298.37 ha). The proposal is located west of the original Marmion Avenue alignment.

In February 1991, the EPA published its report and recommendations (Bulletin 500) for the proposal. The Minister's associated statement of approval and environmental conditions (Ministerial Statement 150) was issued on 8 July 1991.

During the assessment period for the EBR PER a number of proposal details were modified as a result of the public submissions received, the EPA's assessment and feasibility studies undertaken by the proponent, however the central components of the project (golf course, marina, resort and residential estate) remained the same.

With respect to the Foreshore reserve Ministerial Statement 150 requires:

> *3. Foreshore Reserve*
>
> *The Public is to have ownership of and thereby adequate access to all foreshore of the developed site.*

*Prior to the commencement of any site works, the proponent shall prepare a plan indicating that all foreshores be included in a Crown Reserve and showing the location and dimensions of the Reserve. The plan is to be acceptable to the Minister for the Environment, the Minister for Planning, the Minister for Lands and the Minister for Transport.*

Ocean Dunes Pty Ltd submitted a revised concept design plan for the EBR proposal as requested under Ministerial Statement 150. This concept design plan identified the foreshore reserve, environmentally significant areas to be transferred from private lands to the Crown, access ways to the foreshore reserve and a plan to protect the dune system during development. As such Condition 3 of Ministerial Statement No. 150 has been historically satisfied.

### 2.2.2 MRS Amendment 932/33

The first District Structure Plan (DSP) for the Alkimos–Eglinton area was prepared in 1993 by the landowners within the DSP area. A study defining the boundary of the foreshore reserve, the alignment of Marmion Avenue and the Mitchell Freeway was completed by Alan Tingay and Associates in 1993 as part of the preparation of the DSP (Alan Tingay & Associates and Feilman Planning Consultants, 1993). An alternative foreshore reserve boundary was determined in 1993 on behalf of the Department of Planning and Urban Development, (now the Department of Planning), in the event that the resort/golf course did not proceed and the land was developed for residential purposes instead.

Amendment 932/33 was part of a program of major amendments to the MRS undertaken through the 1990s to implement *Metroplan* (Department for Planning and Infrastructure (DPI), 1990) and the *Urban Expansion Policy* (DPI 1990). MRS amendment (932/33) enabled the re-zoning of the Eglinton Estates landholding from "Rural", "Waterways Reservation" and Parks and Recreation" to "Urban", and "Parks and Recreation", allowing implementation of the golf course, marina, resort and urban development consistent with that approved under Ministerial Statement 150.

The EPA provided informal advice to the then State Planning Commission on Amendment 932/33 in August 1993 (Bulletin 729). Amendment 932/33 was gazetted in 1995.

### 2.2.3 Alkimos Eglinton MRS Amendment 1029/33- Ministerial Statement 722

MRS Amendment 1029/33 for the Alkimos Eglinton area was initiated by the WAPC to implement the changes proposed in a revised DSP (1997). MRS Amendment 1029/33 covers the entire Alkimos Eglinton region including the area approved for development under Ministerial Statement 150. The areas subject to rezoning under MRS Amendment 1029/33 did not impact on the Eglinton Beach Resort project area, as this area was previously zoned "Urban" under the previous MRS Amendment 932/33. During 2000-2003 the DSP (1997) was superseded by the Alkimos–Eglinton Concept Structure Plan.

In November 2005, the EPA provided their report (Bulletin 1207) on MRS Amendment 1029/33. In April 2006, The Minister for the Environment recommended that the scheme amendment could be environmentally acceptable if a set of conditions were addressed as outlined in Ministerial Statement 722.

The Minister for the Environment's Statement 722 (published on 24 April 2006) states that (with the exception of an area near the Groundwater Treatment Plant) "*all land reserved for Parks and Recreation shall be managed to protect the integrity, function and environmental values of the*

*bushland and landforms to the requirement of the Western Australian Planning Commission on the advice of the Environmental Protection Authority and shall only be used for conservation, landscape and complimentary purposes*".

Ministerial Statement No. 722, also includes the following condition:

> *2-1 Prior to approving subdivision or development applications (whichever is sooner) for infrastructure proposals, the Western Australian Planning Commission or local government, as the case requires, may require an Environmental Management Plan to be prepared and implemented to achieve the objective of managing the potential impacts of the proposed subdivision, development of infrastructure on the following:*
>
> 1. *land which is reserved as Regional Open Space in the Scheme; and*
> 2. *bushland or land that may be part of an ecological linkage.*
>
> *The Environmental Management Plan shall include:*
>
> 1. *a description of existing environmental values, and the identification of the environmental outcome to be achieved through the implementation of this plan;*
> 2. *clear delineation of boundaries of significant areas to be protected;*
> 3. *management of construction, access and rehabilitation;*
> 4. *vegetation mitigation strategies;*
> 5. *allocation of responsibilities and identification of timing and duration of implementation;*
> 6. *provision for routine monitoring and environmental values; and*
> 7. *provision of details of contingency plans in the event that the monitoring surveys indicate that the development is having of has had an adverse impact upon the environmental values.*
>
> *2-2 An Environmental Management Plan prepared pursuant to the condition 2-1 shall be prepared to the satisfaction of the WAPC or the local authority as required, having due regard for advice from relevant government agencies and shall be implemented in accordance with a program defined in the Environmental Management Plan.*

This condition applies to all proposals that will have an impact on Parks and Recreation areas, which includes the Amberton foreshore. This Foreshore Management Plan effectively provides the Environmental Management Plan required under Ministerial Statement No. 722 for the Amberton foreshore MRS reservation.

### 2.2.4 Alkimos Eglinton DSP

In 2007, two main landowners prepared and submitted the Alkimos Eglinton District Structure Plan (DSP) to the WAPC and the City of Wanneroo on behalf of all owners within the DSP area. The relevant components of the DSP for the Amberton foreshore reserve are discussed below.

#### *2.2.4.1 Alkimos Eglinton Coastal Strategy*

A coastal strategy for the Alkimos and Eglinton DSP area was prepared to facilitate the DSP and to amalgamate and update previous coastal planning studies.

This Alkimos Eglinton Coastal Strategy provided indicative and potential uses for the foreshore reserve that had been supported by previous coastal planning strategies for the area and that were considered as "complimentary purposes" to the main objectives of conservation and landscape protection in the Minister for the Environment's Statement 722.

The coastal strategy states that the management principles and objectives for the broader Alkimos-Eglinton foreshore reserve were as follows:

- Foreshore reserve to be developed in accordance with the Minister for the Environment's Statement 722 and State Coastal Planning Policy (Statement of Planning Policy No. 2.6).
- Places of unique landscape, scientific and cultural significance to be managed appropriately.
- Natural habitats, particularly areas of high ecological value, to be protected.
- Public places and facilities and public access to the beach in the foreshore reserve to be developed in a manner that does not compromise the ecological values of the area.
- Development in the foreshore reserve to be concentrated in nodes.

Furthermore, it divided the Alkimos Eglinton foreshore into a number of coastal management zones. The Amberton foreshore reserve was included within the Eglinton Marina and Coastal Village Precinct, with the zone classification for this area described as:

- High Use Zone
- Marina
- Active Recreation
- Passive Recreation
- Conservation.

The key objectives of this zone were as follows:

- Conserve the key ecological features of this area of the foreshore reserve in a natural state.
- Control access through the provision of appropriate beach access paths and conservation fencing.
- Any car parking, drainage and public facilities should be located with due consideration of the key ecological values of this area of the foreshore reserve.
- Active recreation such as grassed areas, BBQ and picnic facilities and other public facilities should be permitted in appropriate areas where the integrity of the reserve will not be adversely impacted upon.

Furthermore, the DSP identified that the Amberton area should be a "local beach" and that particular areas of the Amberton foreshore reserve within Parks and Recreation Reserve areas could be used for "possible car park/drainage/picnic facility use". These areas appear to be consistent with large dune blowouts, where there was (and currently is) minimal native vegetation present. The Amberton Coastal Management Zones as depicted in the Alkimos Eglinton Coastal Management Strategy are shown below in **Plate 1**.

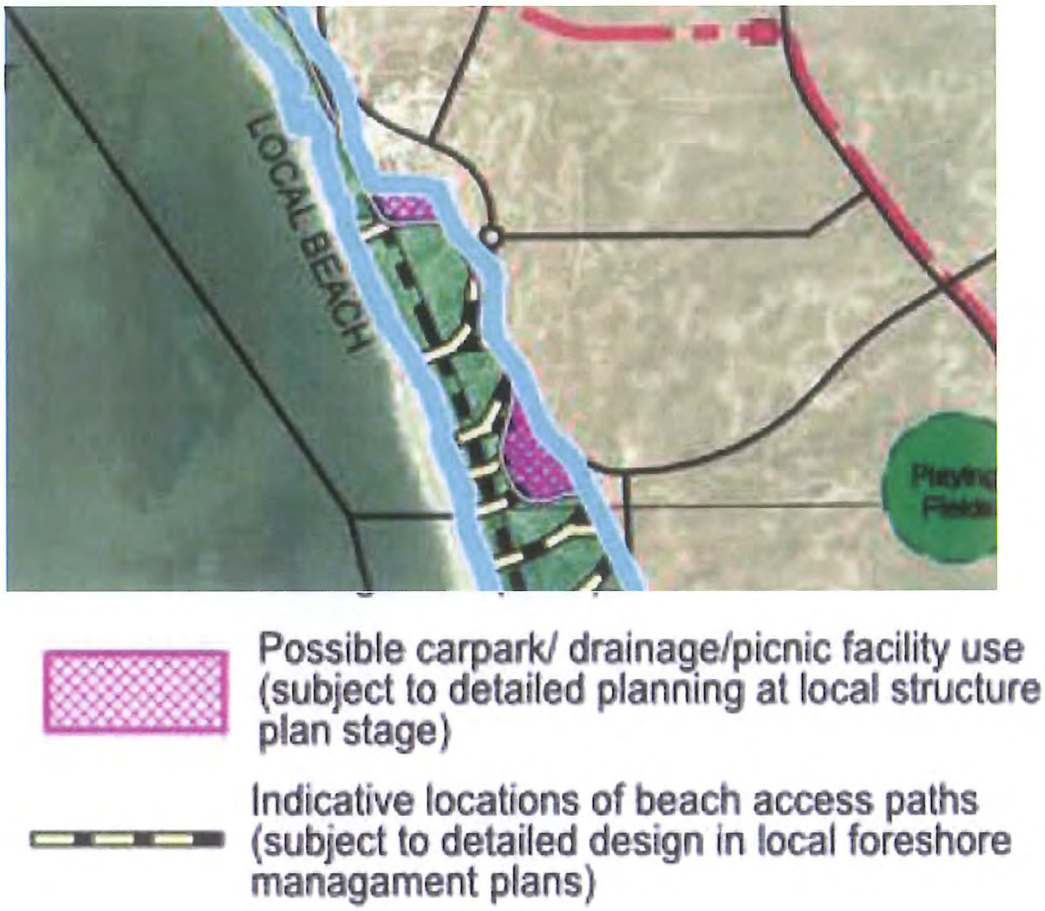


*Plate 1 Excerpt from Alkimos Eglinton District Structure Plan, (Figure 3 Coastal Management Zones).*

### 2.2.5 Eglinton LSP No. 82

In 2010, the Eglinton LSP No. 82 was prepared and submitted to the WAPC and City of Wanneroo (**Appendix A**). The LSP has been planned around the previously proposed conservation areas that provide an ecological link between the Bush Forever sites to the north and south.

As part of the LSP preparation process a coastal processes assessment was undertaken by M.P. Rogers and Associates in 2011 in accordance *State Planning Policy 2.6: State Coastal Planning* Policy (SCPP) and Schedule 1 of SCPP which provided guidelines on coastal setbacks based on current climate change information at that time (WAPC Position Statement). The assessment resulted in a recommended coastal processes setback that extended eastward from the currently zoned foreshore reserve (as defined by the MRS Parks and Recreation reserve). The LSP established a foreshore reserve to respond to the recommended coastal processes setback through the provision of Public Open Space (POS) on Urban zoned land in addition to the MRS reservation to make up the Amberton foreshore reserve.

The LSP states that within the Amberton foreshore reserve "*large areas of totally degraded dune and dunal vegetation are proposed to be utilised as a recreation development node. This will incorporate beachside facilities such as car parking, barbeques, shelter facilities, foot paths and a grassed drainage swale*".

This is reflected in the LSP plan which shows two possible foreshore recreation development nodes plus a possible beachside restaurant/café/corner store within the Amberton foreshore reserve (**Appendix A**). The LSP also shows a coastal road adjacent to the foreshore reserve, plus a regional foreshore shared path.

The LSP was adopted by the City of Wanneroo in December 2012 and endorsed by the WAPC in February 2013.

## 2.3 Statutory requirements

The Amberton FMP will facilitate the resolution of a number of statutory and policy requirements as outlined below in **Table 1**.

*Table 1 Statutory requirements satisfied by this FMP.*

| LEGISLATION/POLICY | REQUIREMENT | ACTION TO ADDRESS REQUIREMENT |
|---|---|---|
| *Environment Protection and Biodiversity Conservation Act 1999.* | A referral has been submitted by the developer including the foreshore reserve within the site. This referral was deemed by the Department of Environment to be "not a controlled action". | No action required. |
| State Coastal Planning Policy 2.6 (see **Section 2.1.1**) | Accommodate a coastal processes setback and reflect this in the allocated foreshore reserve.<br>Prepare a CHRMAP to assess and provide a framework to manage risks associated with any development within the foreshore reserve. | Foreshore reserve defined in adopted LSP No. 82.<br>Implementation of the FMP and CHRMAP to allow consideration of future coastal hazards. |
| Bush Forever and Bushland Policy for the Perth Metropolitan Region (see **Section 2.1.2.1**) | Proposals should support a general presumption against the clearing of regionally significant bushland.<br>The preparation and implementation of a bushland management plan to managed the Bush Forever reserve for conservation purposes. | Preparation of this FMP as a bushland management plan.<br>Implementation of the FMP to protect and manage the Bush Forever site. |
| Ministerial Statement No. 722 (see **Section 2.2.3**) | *2-1 Prior to approving subdivision or development applications (whichever is sooner) for infrastructure proposals, the Western Australian Planning Commission or local government, as the case requires, may require an Environmental Management Plan to be prepared and implemented to achieve the objective of managing the potential impacts of the proposed subdivision, development of infrastructure on the following:*<br>• *land which is reserved as Regional Open Space in the Scheme; and*<br>• *bushland of land that may be part of an ecological linkage.*<br>*The Environmental Management Plan shall include:*<br>• *a description of existing environmental values, and the identification of the environmental outcome to be achieved through the implementation of this plan;*<br>• *clear delineation of boundaries of significant areas to be protected;*<br>• *management of construction, access and rehabilitation;* | Preparation of this FMP as an environmental management plan.<br>Specifically this FMP includes:<br>• a description of existing environmental values, and identification of the environmental outcome to be achieved through the implementation of this plan (**Section 3**, **Section 6** and **Section 7**).<br>• clear delineation of boundaries of significant areas to be protected (**Figure 11**).<br>• management of construction, access and rehabilitation (**Section 7.1**).<br>• vegetation mitigation strategies (**Section 7.3**).<br>• allocation of responsibilities and identification of timing and duration of implementation (**Section 7.10** and **Section 9**). |

| LEGISLATION/POLICY | REQUIREMENT | ACTION TO ADDRESS REQUIREMENT |
|---|---|---|
| | • *vegetation mitigation strategies;*<br>• *allocation of responsibilities and identification of timing and duration of implementation;*<br>• *provision for routine monitoring and environmental values; and*<br>• *provision of details of contingency plans in the event that the monitoring surveys indicate that the development is having of has had an adverse impact upon the environmental values.*<br>*2-2 An Environmental Management Plan prepared pursuant to the condition 2-1 shall be prepared to the satisfaction of the WAPC or the local authority as required, having due regard to advice from relevant government agencies and shall be implemented in accordance with a program defined in the Environmental Management Plan.* | • provision for routine monitoring and environmental values (**Section 7.3**, **Section 9** and **Section 10.6**).<br>• provision of details of contingency plans in the event that the monitoring surveys indicate that the development is having of has had an adverse impact upon the environmental values (**Section 10** and **Section 9**).<br><br>Implementation of the FMP to manage the natural environment, including revegetation outlining responsibilities monitoring and ongoing management. |
| Alkimos Eglinton District Structure Plan (see **Section 2.2.4**) | The Alkimos Eglinton Coastal Strategy produced as part of the DSP provides indicative and potential uses within the foreshore.<br>The objectives for the foreshore include:<br>• Conserve the key ecological features of this area of the foreshore reserve in a natural state<br>• Control access through the provision of appropriate beach access paths and fencing<br>• Any car parking, drainage and public facilities should be located with due consideration of the key ecological values of this area of the foreshore reserve<br>• Active recreation such as grassed areas, BBQ and picnic facilities and other public facilities should be permitted in appropriate areas where the integrity of the reserve will not be adversely impacted upon.<br>The foreshore is identified as a local beach and two specific areas are identified for "possible car park/drainage/picnic facility use". | Foreshore objectives are addressed through this FMP.<br>FMP to outline implementation of relevant objectives of Alkimos Eglinton Coastal Strategy. |
| Eglinton Local Structure Plan (see **Section 2.2.5**) | The Local Structure Plan notes the following: *"large areas of totally degraded dune and dunal vegetation are proposed to be utilised as a recreation development node. This will incorporate beachside facilities such as car parking, barbeques, shelter facilities, foot paths and a grassed drainage swale".* | Foreshore design and management has considered LSP recommendations. |

## 2.4 Aboriginal heritage sites

The Department of Aboriginal Affairs (DAA) maintains an Aboriginal Inquiry System for both the heritage site register and the heritage survey database. The Aboriginal Heritage Site Register is maintained pursuant to Section 38 of the *Aboriginal Heritage Act 1972* (AHA) (DAA 2011) and contains information on over 22,000 listed Aboriginal sites throughout Western Australia. Based on an online search of the inquiry system, the site was not registered as containing Aboriginal Heritage sites (DAA 2011).

A *Report of the Ethnographic Consultation and Archaeological Inspection Eglinton Local Structure Plan Area* was produced for Woodsome Management in July 2010 (McDonald and Coldrick 2010). This plan did not identify any archaeological or ethnographic sites within the Amberton foreshore reserve.

# 3 Foreshore Reserve Existing Environmental Conditions

The Amberton foreshore reserve extends over 700 m in length (along the coast) ranging in width from 150 m to 200 m with a total area of approximately 11 ha. Currently the site is covered partly with intact remnant coastal vegetation primarily in the central portion, with various blowouts, informal paths and tracks used for beach access and by recreational vehicles. The northern and southern most sections have been significantly impacted through historic uncontrolled access and consequential wind erosion causing large blow out areas. These areas now retain limited natural values (biodiversity or natural landforms) and will require significant future investment and attention (as described in this FMP) to stablise these areas and restore natural values.

The below sections describe the environmental attributes and features of the foreshore reserve in accordance with the City of Wanneroo's *Environmental Management Plan Guidelines* (2013). Additional information on the existing environment is provided as **Appendix B**.

## 3.1 Climate, landforms and topography

The coastal frontage of the Amberton foreshore reserve is comprised of discontinuous dunes approximately 1 km wide. These dunes have elevations up to 30 m AHD as shown in **Figure 4**. The site is characterised by the Quindalup dunes system, with the visible presence of limestone outcrops due to surface soil removal from wind action.

The beach edge is defined by small emergent foredunes which have been degraded by wind and wave action and further eroded by uncontrolled 4WD beach access. The beach is relatively wide (40 – 50 m) and for most of its length is backed by a 10 – 20 m high primary dune, with transgressive dunes extending two to three kilometres inland. Swales between the dunes have been degraded by 4WD access. Secondary dunes reach to 30 m with views to the north and south and these dunes form the landward extent of the foreshore reserve. There are two predominate blowout areas within the foreshore reserve – one to the north and one to the south. Both of these occur behind the primary dune and have been extensively degraded by uncontrolled access.

The landforms and topography of the site have been considered in this FMP with regards to the location of public access, the provision of lookouts and passive surveillance. The stability of degraded landforms (i.e. dune blow outs) within the foreshore and techniques to improve stability have also been considered in this FMP.

The predominant winds are from the south-west and are a very important feature of coastal environments as they are a major determinant of landward sand migration, influencing landforms and landscape. During summer, winds blow from the east to south east in the morning (4am to midday) and from the south-west in the afternoon (1pm to 6pm, the local sea breeze). Winter is characterised by north-westerly storm winds that back around to the west and south-west, interspersed with calmer periods. These climatic conditions have been considered in this FMP when allocating areas of amenity and public recreation to provide shelter from coastal winds. In addition, this FMP has considered the orientation of access locations to reduce sand drift across this infrastructure.

Further information on the prevailing climatic conditions is available in **Appendix B**.

## 3.2 Geology and karstic features

The foreshore reserve is located within the Quindalup dunes geomorphic entity, within the parabolic dune complex. The Quindalup dunes are described as "coastal dunes with dominant calcareous deep sand, with shallow calcareous sand and yellow or brown sand".

The Perth Metropolitan Region 1: 50,000 Environmental Geology Series, Yanchep (Sheet 2034 IV) (Gozzard 1982) indicates that the subject site is largely comprised of calcareous sand (S2) with the presence of a finer calcareous sand (S1) located along the south of the Amberton foreshore reserve. The general description of the soil units are provided below in **Table 2.**

*Table 2 Soil Mapping Description*

| MAP UNIT | DESCRIPTION |
|---|---|
| S1 | Calcareous Sand - white fine to medium grained sub-rounded quartz and shell debris, of eolian origin. It is safety Bay sand (mobile dunes). Active blowouts and san sheets, unvegetated. |
| S2 | Calcareous Sand - same as S1. Safety Bay Sand. Moderate to steep slopes, and susceptible to remobilization where the sparse vegetation is removed. |

Karst features are known to generally occur within Tamala limestone, which is not mapped as occurring within the foreshore reserve. City of Wanneroo released Draft LPP4.13 *Caves and Karstic Features* (July 2012) (City of Wanneroo 2012b), which has been prepared under the provisions of Section 8.11 of the *City of Wanneroo District Planning Scheme No.2.* (City of Wanneroo 2012a). The purpose of the policy is to outline the information requirements required for investigation and management of caves and karstic features to assist in design, assessment and determination of structure plans, subdivision applications and development applications.

The karst assessment and risk map associated with this policy identifies the foreshore reserve as being an area of "low" karst risk.

A desktop geotechnical assessment was undertaken by Coffey Geosciences (2006) as part of the DSP preparation process and did not identify any karstic features within the foreshore reserve.

The geology of the foreshore reserve is shown in **Figure 5.** Further information on the geology of the foreshore reserve is available in **Appendix B**.

## 3.3 Soils and hydrology

The Alkimos - Eglinton area consists of Holocene Safety Bay sand and Tamala limestone. The yellowish brown fine to course grained aeolian calcarenite occurs as limestone overlain by the white, fine to medium grained Safety Bay Sands forming coastal dunes. The soils of the foreshore reserve are shown in **Figure 6**. The foreshore reserve within the Quindalup dunes contains Safety Bay sand and contains weakly cemented limestone cap rock.

Erosion and depositional processes occur along the Eglinton coastline. Wave and wind activity create mobile or stabilized dunes which are covered in vegetation. Removal of vegetation can create unstable dune systems which can lead to further erosion and the creation of blow outs. As outlined above, soils and topography require consideration in this FMP in order to stabilize degraded dune blowouts.

Depth to groundwater over the Amberton site is highly variable due to the variable topography associated with dune formations. The Perth Groundwater Atlas indicates depth to groundwater along the coast is approximately 0 m AHD, and rises with distance from the coast. The foreshore reserve ranges in elevation from 0 m to 30 m so therefore depth to groundwater will vary throughout the foreshore reserve. The sandy nature of the foreshore reserve and the visible landforms indicate direct infiltration of rainfall with very little to no surface water runoff. In accordance with this, there are no surface water features (waterways or wetlands) associated with the site.

Emerge Associates conducted site specific infiltration testing at two locations within the foreshore reserve in 2013, and then additional infiltration testing in 2015 within POS areas adjacent to the foreshore reserve. Initial testing in 2013 utilised two different infiltration measurement techniques, and infiltration was found to range from 19.3 m/day to 22.2 m/day in the southern portion of the Amberton foreshore reserve. Infiltration in the northern portion of foreshore reserve was higher ranging from 37.4 m/day to 37.5 m/day. During the 2015 infiltration testing, measured rates ranged between 38.27 m/day to 62.15 m/day). Further information on infiltration is available in **Appendix B.**

The Perth Groundwater Atlas indicates groundwater salinity within the foreshore reserve is very saline (approximately 7000 mg/l total dissolved salinity) that decreases with distance from the coast.

## 3.4 Flora and vegetation

### 3.4.1 Vegetation condition

The vegetation condition within the foreshore reserve has been determined in accordance with the Keighery (1994) scale (see **Table 3** and **Figure 7**). Examples of the vegetation condition across the foreshore reserve are shown in **Plate 2.** Further information on vegetation, including information on historic flora and vegetation surveys is contained in **Appendix B**. Vegetation condition will influence revegetation works and conservation areas within this FMP.

*Plate 2 Examples of vegetation condition over the Amberton foreshore reserve.*

*Table 3 Vegetation condition scale (Keighery 1994)*

| CONDITION | DESCRIPTION |
|---|---|
| Pristine | Pristine or nearly so, no obvious signs of disturbance. |
| Excellent | Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. |
| Very Good | Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing. |
| Good | Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing. |
| Degraded | Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing. |
| Completely Degraded | The structure of the vegetation is no longer intact and the areas are completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs. |

### 3.4.2 Vegetation communities

Based on a historic Flora and Vegetation Survey (published within ATA Environmental 2005), four vegetation units were mapped within the foreshore reserve. The vegetation communities were inspected by Emerge Associates in 2012 and the vegetation community mapping was updated. The updated vegetation communities are outlined in below **Table 4** and shown in **Figure 8**. Vegetation communities provide an indication of the flora species that should be included within revegetation works.

*Table 4 Amberton foreshore reserve vegetation communities*

| VEGETATION COMMUNITY | DESCRIPTION |
|---|---|
| OaASc | Shrubland of *Olearia axillaris, Acacia spp. Scaevlola crassifolia* and *Spyridium globulosum* over forbland of *Lomandra maritima*. |
| ArMs | Low open heath of *Acacia rostellifera* and *Melaleuca systena.* |
| OaSl | Open shrubland of *Olearia axillaris* over grassland of *Spinifex longifolius* and open sedgeland of *Lepiodsperma galdiatum.* |
| MsLm | Low open shrubland of *Melaleuca systena* over forbland to closed forbland of *Lomandra maritima.* |
| Ac | Shrubland *of Acacia cyclops.* |

### 3.4.3 Weed species

A number of weed species have also been historically recorded within the Amberton foreshore reserve. These are listed in **Table 5**. Identification of the key weed species will inform revegetation and restoration works.

*Table 5 Weed species within the Amberton foreshore reserve.*

| WEED SPECIES | COMMON NAME |
|---|---|
| *Avena barbata* | Bearded oat |
| *Cakile maritima* | Sea rocket |
| *Carpobrotus edulis* | Pig face |
| *Ehrharta calycina* | Perennial veldt grass |
| *Euphorbia terracina* | Geraldton carnation weed |
| *Euphorbia paralias* | Sea spurge |
| *Hypochaeris glabra* | Daisy |
| *Lagurus ovatus* | Hare's tail grass |
| *Pelargonium capitatum* | Rose pelargonium |
| *Sonchus oleraceus* | Sowthistle |
| *Tetragonia decumbens* | Sea spinach |
| *Trachyandra divaricata* | Dune onion weed |

None of these weed species are declared under the *Agriculture and Related Resources Protection Act 1976*.

## 3.5 Fauna

A vertebrate fauna survey was conducted for the Alkimos - Eglinton area by Alan Tingay & Associates in October 1996 and ATA Environmental in 2005. Based upon these surveys and DPaW's NatureMap Database and the Department of Environment (DoE) Protected Matters database a number of species of conservation significance may occur within or potentially use the site. These significant species are listed below in **Table 6**.

*Table 6 Conservation significant species which may potentially use the site (based on DoE Protected Matters search tool, DEC Naturemap database, Alan Tingay and Associates 1996 and Bamford and Davies 2005)*

| SPECIES | | CONSERVATION SIGNIFICANCE | | |
|---|---|---|---|---|
| **COMMON NAME** | **SCIENTIFIC NAME** | **DEC** | **WAWC** | **EPBC** |
| **MAMMALS** | | | | |
| Chuditch | *Dasyurus geoffroii* | | S1 | VU |
| Quenda | *Isoodon obesulus fusiventer* | P5 | | |
| Western Brush Wallaby | *Macropus irma* | P4 | | |
| **BIRDS** | | | | |
| Carnaby's black cockatoo | *Calyptorhynchus latirostris* | | S1 | EN |
| Gibson's Albatross | *Diomedea exulans gibsoni* | | S1 | VU |
| Malleefowl | *Leipoa ocellata* | | S1 | VU |
| Southern Giant-Petrel | *Macronectes giganteus* | P4 | | EN |
| Northern Giant-Petrel | *Macronectes halli* | | | VU |
| Australian Painted Snipe | *Rostratula australis* | | S1 | VU |
| Fairy Tern (Australian) | *Sternula nereis nereis* | | S1 | VU |
| Peregrine Falcon | *Falco peregrinus* | | S4 | |
| Rainbow Bee Eater | *Merops ornatus* | | S3 | MIG |
| Shy Albatross, Tasmanian Shy Albatross | *Thalassacrche cauta cauta* | | S1 | VU |
| **INVERTEBRATES** | | | | |
| Graceful Sun Moth | *Synemon gratiosa* | P4 | | EN |
| **REPTILES** | | | | |
| Carpet Python (south-western spp.) | *Moreila spilota imbricata* | | S4 | |
| Black striped-snake | *Neelaps calontus* | P3 | | |

Subsequent to this, a graceful sun moth survey was conducted by Coffey Environmental (2010) in order to determine the presence and density of the graceful sun moth within the Eglinton Estate. This survey did not reveal any graceful sun moth along any transects located within the Amberton foreshore reserve. This is likely due to the higher velocity winds experienced in the primary dunes. It is also relevant to note that the graceful sun moth is no longer a listed species under the *Environment Protection and Biodiversity Conservation Act 1999* or the *Wildlife Conservation Act 1952*.

Overall, the Amberton foreshore reserve would provide fauna habitat for small birds, mammals and reptiles, who could seek shelter within the remaining areas of native vegetation. Maintaining connectivity and improving fauna habitat values (through revegetation) is an important consideration for this FMP.

## 3.6 Coastal nearshore environment.

The Alkimos - Eglinton area is generally protected from the effects of long period oceanic swell and short period local wave activity by a series offshore reefs (RPS Bowman Bishaw Gorham 2006), including the well-known Alkimos reef south west of the site. These reefs help dissipate wave energy in the area.

The shoreline portion of the foreshore (beach) varies from 30 to 80 m and is predominately sandy, however there are small sections of partly exposed beach rock. Beaches are backed by a 10 to 20 m high primary dune with a number of blow outs. The presence of beach rock and offshore reefs will influence the usage and water based activities of the Amberton foreshore reserve and consequently the future access, useage and amenity provided in this FMP reflects these coastal nearshore conditions.

## 3.7 Past and present land uses

### 3.7.1 Historical and current landuse

Currently the Amberton foreshore reserve is undeveloped and is characterised by remnant bush land and evidence of extensive vehicle tracks and blowouts. The property was once used for light cattle grazing although there is no evidence or records of any intensive agriculture within the last 50 years.

The site is identified by the Department of Defence (DoD) mapping ("Where is UXO" map, available on the DoD website) as having "Other" Unexploded Ordnance (UXO) potential. The definition of "Other" potential is: "*Defence records do not confirm that the site was used for live firing. UXO or explosive ordnance fragments have not been recovered from that site. Defence opinion is that it would be inappropriate to assess as either slight or substantial*". "Other" UXO potential is recorded through the Butler-Jindalee and Alkimos-Eglinton area (DoD 2012).

The remains of the Alkimos Shipwreck (wrecked in 1963) saw increased visitation to the area, which resulted in the creation of numerous foreshore tracks since this time. The heavy usage of these tracks for beach access has increased the degradation of the foreshore vegetation and has contributed to significant dune blowouts.

Currently areas of the Amberton foreshore are accessed illegally by recreational vehicles for off-road use, including four wheel drives, quad bikes and trail bikes. This has created a number of tracks throughout the Amberton foreshore reserve (see **Plate 3**). In addition, accessible parts of the foreshore reserve have been subject to fishing, rubbish dumping and other undesirable activities (see **Plate 4**). Addressing these historic and ongoing land uses is an important consideration for this FMP.

### 3.7.2 Future adjacent land use

As outlined in **Section 2.2**, the site and wider Alkimos Eglinton area have been subject to an extensive historic planning process. The Alkimos Eglinton area will be subject to extensive urban development, incorporating a number of primary and high schools, a train station, town centre, commercial development and a marina precinct.

With regards to the foreshore, the site is immediately north of the Shorehaven development within Alkimos, also referred to as "North Alkimos". The FMP for this area was approved in 2012 and the foreshore will be developed as a recreational node, incorporating a foreshore park and beach club.

North of Amberton is a small local beach and the Eglinton marina. Both of these areas are currently owned by Eglinton Estates and are expected to be developed over the next 20 years. Connectivity between Amberton and areas to the north and south is an important consideration within this FMP and is discussed further in **Section 7.6.2**.

*Plate 3 Informal access tracks through the Amberton foreshore reserve.*

*Plate 4 Evidence of unauthorised access and undesirable activity within the Amberton foreshore reserve.*

## 3.8 Coastal processes setback requirements

In order to determine an appropriate coastal setback, the SCPP outlines the recommended criteria for determining the Physical Processes Setback (PPS). This setback provides protection from physical coastal processes over a 100 year planning horizon (SCPP). The 2003 SCPP was used to determine the coastal setback requirement for the Eglinton LSP in 2011, which now forms the Amberton foreshore reserve (and the subject of this FMP).

The coastal processes setback is based on criteria to calculate and determine the PPS. The three allowance criteria include acute storm erosion, historic shoreline movement and sea level change.

Acute Storm Erosion (S1) incorporates increased erosion of the shoreline with changing wind speeds and increased water levels that come with storm surges and storm events. S1 was calculated using the SBEACH model developed by the Coastal Engineering Research Centre to simulate beach profile evolution in regards to storm events. The S1 is calculated using the SBEACH profile change model to simulate three repeats of a severe storm experienced in the south west of WA in July 1996.

Historical Shoreline Movement (S2) captures the longer term processes that are likely to affect the shoreline in the future. Aerial photography and vegetation mapping is used to observe changes in the shoreline through history, and therefore determine shoreline movement rates and allowances required for the next 100 years.

Impact of Climate Change (S3) includes an allowance for possible climate change condition and sea level rise to occur over the coming century. Due to uncertainties, predictions have to be made in regards to the changes that will take place in the future. A suggestion to use 0.9m allowance for sea level rise to 2110 was decided by the WAPC in 2010. This allowance was based on the Intergovernmental Panel on Climate Change (IPCC) AR4 model scenario.

The results of the 2011 Eglinton Coastal Setback Assessment are outlined in the **Table 7**.

*Table 7 Total Recommended PPS (M.P Rogers & Associates, 2011)*

| FACTOR | ALLOWANCE (M) | |
|---|---|---|
| | CHAINAGE 0-600M | CHAINAGE 600-800M |
| S1- Acute Storm Erosion | 25 | 25 |
| S2- Historical Shoreline Movement | 30 | 25-30 |
| S3- Climate Change | 90 | 90 |
| Total Recommended PPS | 145 | 145-135 |

The table indicates that a minimum foreshore reserve width of 135 -145m would be required contain the planning timeframe PPS. This PPS is shown below in **Plate 5** and has been reflected in the foreshore reserve, incorporating areas of existing Parks and Recreation Reservation and additional areas of "Urban" zoning (see **Figure 2**), which are allocated for public open space within the endorsed Eglinton LSP (**Appendix A**).

The development of the Eglinton marina to the north of the Amberton foreshore reserve would be exempt from the SCPP. The development of the marina will be guided by the potential structures to be

put in place, and their impact on wave action overtopping parts of the marina. These factors will be taken into account during design and construction of the marina works.

The Eglinton coastline formation is influenced by a series of offshore Tamala limestone ridges located between 1300 m - 5000 m from the coast. These reefs run parallel to the coast protecting it from offshore wave action and influencing sediment transport patterns. These factors influence the Amberton foreshore reserve which was modified to incorporate all these natural setbacks.

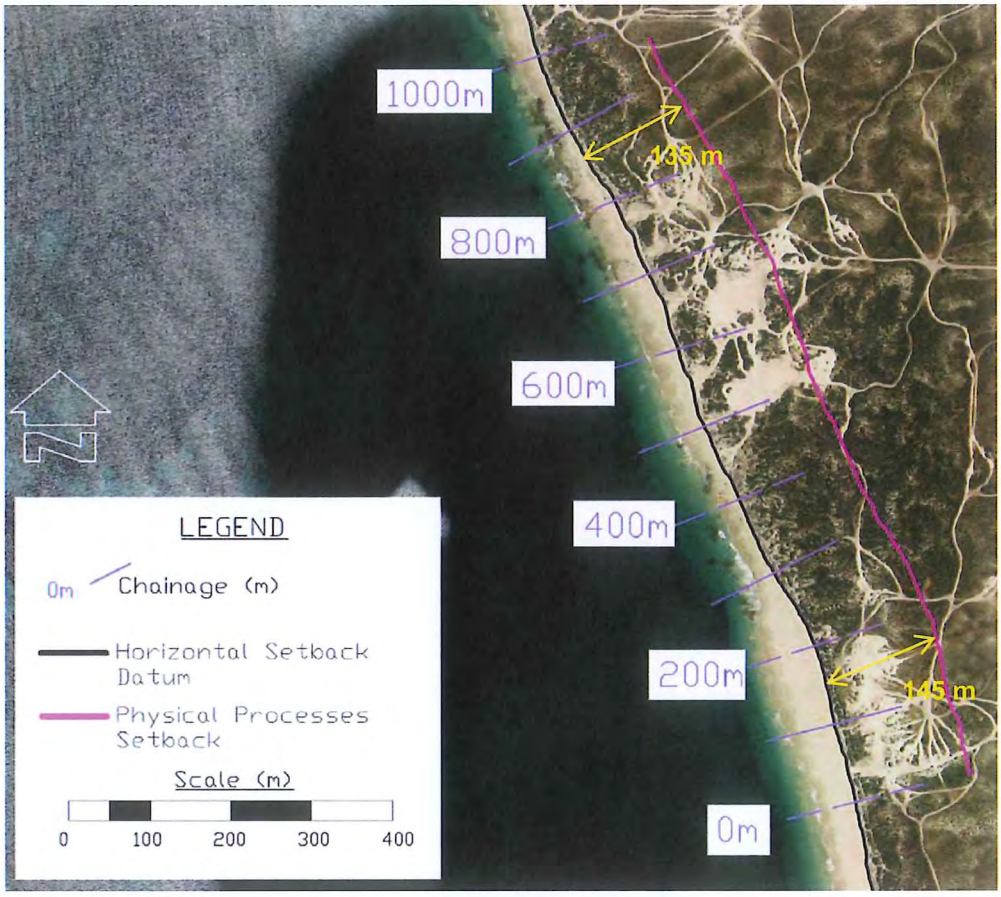


*Plate 5 Recommended Physical Processes Setback. Note Amberton Foreshore reserve extends to 700m chainage. (M.P. Rogers and Associates 2011).*

The coastal processes setback is shown in **Figure 2.**

# 4 Stakeholder Consultation

As outlined in **Section 3**, the Amberton foreshore reserve has been considered historically as part of various environmental and planning approval processes and these processes have involved consultation with various stakeholders. While this has not focused on the foreshore in particular, the approvals have defined a number of parameters for the Amberton foreshore reserve including:

- The extent and boundaries of the "Parks and Recreation" reservation within the Amberton foreshore reserve (see **Figure 2**).
- The required coastal setback for the Amberton foreshore reserve, as defined by M.P. Rogers and Associates in 2011 and confirmed through the endorsement of the Eglinton LSP in 2013. For the Amberton foreshore reserve this includes areas beyond the "Parks and Recreation" Reserve, addressed through the provision of additional areas of POS.
- Two coastal management zones within the Amberton foreshore reserve incorporating "possible car park/drainage/picnic facility use" defined through the Alkimos-Eglinton DSP.
- The requirement for an Environmental Management Plan for "Parks and Recreation" zoned areas associated with Ministerial Statement No. 722.

Further to these parameters, a specific consultation session and workshop was undertaken with staff from the City of Wanneroo and the DoP Coastal Planning Branch at the site (5th February 2013). This workshop involved a review of the information to date and a presentation of the preliminary foreshore concepts for the site. Following this, the workshop attendees conducted a site visit over the entire foreshore to view the site on the ground.

The key stakeholders who attend this workshop included:

- Melinda Goode (Environmental Planner, City of Wanneroo)
- Helen Gray (Landscape Architect, City of Wanneroo)
- Tristan Bruyn (Environmental Planner, City of Wanneroo)
- Jeremy Thompson (Planner, City of Wanneroo)
- Sujit Shrestha (Engineer, City of Wanneroo)
- Ben Bassett (Senior Planning Officer, Coastal Planning, Department of Planning)
- Jas Lapinski (Planner, Department of Planning).

This FMP has considered the comments made at these consultation sessions (and subsequent meetings) and has been amended through the process.

Further to this, an additional stakeholder meeting was held at the City of Wanneroo in May 2014 to present a revised FMP and discuss comments raised by the City of Wanneroo on the previous workshop. The external stakeholders who attended this meeting included:

- Jeremy Thompson (Planner, City of Wanneroo)
- Ben Bassett (Senior Planning Officer, Coastal Planning, Department of Planning)
- Alex Gavranich (Environmental Planner, City of Wanneroo)
- Peter Erskine (Engineer, City of Wanneroo)
- Michelle Meuwese (Landscape Officer, City of Wanneroo)
- Edward O'Connell (Planner, City of Wanneroo).

A copy of the Amberton FMP was provided to the City of Wanneroo and DoP in July 2014. Comments on the Amberton FMP were provided by both stakeholders in September 2014. Subsequent to this, additional meetings were held with the City of Wanneroo and the DoP to clarify these comments including:

- Meeting with Ben Bassett (Senior Planning Officer, Coastal Planning, Department of Planning) on 30th October 2015 to discuss the foreshore reserve interface.
- Meeting with Mark Dickson (Director – City Growth, City of Wanneroo) and Alex Gavranich (Environmental Planner, City of Wanneroo) on 3rd November 2014 to discuss the City of Wanneroo's comments.
- Workshop with Mark Dickson (Director – City Growth, City of Wanneroo) and Alex Gavranich (Environmental Planner, City of Wanneroo) on the 9th April 2015 to specifically discuss coastal assets within the foreshore.

A revised version (Revision C) was provided to both the City of Wanneroo and the DoP in May 2015. At this point DoP indicated that in principle they were happy with the document, and a number of additional meetings and discussions were held with the City of Wanneroo following additional comments provided by the City of Wanneroo on 22 June 2015. These comments were accommodated (Revision D) and submitted back to the City of Wanneroo. As part of preparing the Council Agenda papers, additional amendments were requested by the City of Wanneroo, and these were accommodated into this current document (Revision E) to be presented to Council in August 2015.

Consultation has also been conducted with Surf Life Saving Western Australia (SLSWA) on the most appropriate location for a swimming beach and the requirements for any surf lifesaving infrastructure. SLSWA have prepared a Coastal Aquatic Risk Assessment (CARA, **Appendix C**) to outline costal risks and management and this has been a key input into this FMP. The results of the CARA and its influence on the FMP is discussed further in **Section 7.7.**

In addition, the existing Amberton community has been kept informed with the general content of the Amberton FMP and importantly the approval process required prior to any foreshore works commencing. Stockland are committed to continuing consultation and open engagement with all stakeholders, including approval authorities and residents through the approval and implementation of the FMP.

# 5 Foreshore Constraints, Issues and Opportunities

Based on historic surveys, technical assessments and detailed site inspections undertaken by Emerge and the broader Amberton project team, the following constraints, issues and opportunities were identified as being relevant for the Amberton FMP.

In this section, constraints are defined as those factors where there is government policy or guidance for a particular environmental feature which dictates a specific management response or approach. Issues reflect environmental features which may influence development including the management, siting and design of particular infrastructure and facilities. In contrast, opportunities represent areas where environmental features are particularly advantageous for future use and management within the foreshore reserve.

## 5.1 Constraints

A key constraint for the future use and management of the Amberton foreshore reserve is the coastal processes setback which was discussed in **Section 3.8.** An assessment undertaken by M.P Rogers recommended a coastal processes setback of between 135 -145 metres. As shown in **Figure 2** the coastal processes setback generally extends beyond the foreshore Parks and Recreation reserve under the MRS which was previously considered by the Department of Planning and the EPA through MRS Amendment 1029/33.

On this basis, the Eglinton LSP allocated additional POS adjacent to the MRS Parks and Recreation reserve to account for this setback and to create the Amberton foreshore reserve.

With regards to public foreshore access and the potential location of facilities, another constraint is the "Excellent" condition native vegetation which exists in the centre of the foreshore reserve (see **Plate 6** and **Figure 7**). In accordance with the Alkimos – Eglinton Coastal Strategy, there is a need to conserve the key ecological features of the foreshore reserve in a natural state, so it is important that this area is treated appropriately to retain vegetation, while still providing some amenity and passive recreation/visual amenity opportunities. Native vegetation can also provide an opportunity through the stabilisation of dunes and providing biodiversity values.

## 5.2 Issues

The key issues associated with the design and development of the FMP generally relate to the current and historic land uses of the site, which have shaped the condition of the foreshore reserve. Specifically, addressing ongoing erosion within the foreshore (see **Plate 7**) will require significant investment and innovative rehabilitation techniques. Likewise addressing and controlling uncontrolled access as the foreshore is developed over time is a significant issue which will require consideration through the implementation of the FMP.

Balanced with these issues, is the requirement to provide safe and controlled access for beach users to the beach for swimming and recreation.

While large areas of the Amberton foreshore reserve are degraded, there are also large areas of native vegetation and the damage and degradation of the existing foreshore vegetation, including the spread of weed species is another issue which requires consideration in the FMP.

*Plate 6 Example of vegetation within foreshore in "Excellent" condition.*

## 5.3 Opportunities

While there are issues and constraints associated with the Amberton foreshore reserve, the existing environment and physical conditions within the foreshore reserve also provides a range of opportunities.

Historic land uses over the site have caused the formation of several degraded foreshore areas. The FMP provides an opportunity to stabilise and restore these areas of the foreshore, and to also locate public infrastructure and amenity in the foreshore reserve without the need for clearing native vegetation (see **Plate 7**). These areas provide opportunity for flood storage areas, small landscaped and turfed areas and nodal points.

Similarly, existing informal off-road vehicle tracks created associated with uncontrolled access to the site provide an opportunity to create pathways through the foreshore reserve, providing to the beach (see **Plate 8**). This will minimise the impact of access on existing native vegetation and will allow a high degree of public access and use.

The undulating topography also provides an opportunity to use the foreshore management plan to maximise views and panoramas, to celebrate the coastal environment and to maximize the connection to the coast (see **Plate 9**).

As outlined in **Section 5.1**, the Amberton foreshore reserve includes areas of vegetation in "Excellent" condition. While these can also be viewed as constraints as outlined above, these (and other) areas of native vegetation provide an opportunity to retain and protect biodiversity values within the foreshore reserve, including fauna habitat. Importantly, areas of native vegetation also provide a significant

opportunity to address dune stabilisation and provide protection from minor coastal erosion and storm events.

Overall, the opportunities allow a high degree of public access and use within the foreshore reserve without impacting on environmental values, such as native vegetation. The implementation of the FMP will provide a significant investment into coastal facilities and management, including revegetation works. The implementation of the FMP provides the opportunity to reduce the undesirable activities which are currently undertaken in the foreshore reserve and are continuing to degrade the foreshore.

*Plate 7 Existing blowout creating an opportunity for public infrastructure*

*Plate 8 Existing tracks to beach creating opportunities for future public access.*

*Plate 9 High points within the Amberton foreshore reserve for vantage viewing opportunities.*

# 6 The Amberton Foreshore Management Plan

The proposed Amberton FMP has been articulated in a concept foreshore master plan shown **Figure 10.** The concept foreshore master plan incorporates a number of components of the foreshore management approach, including:

- Node incorporating café
- Boardwalks and pathways
- Amenities and structures including beach showers, shelters and lookouts
- Carparking
- Passive recreation areas
- Stormwater management.

Stockland and the City of Wanneroo acknowledges that this FMP is conceptual and that the detailed design of all prescribed assets and infrastructure will occur during the development application stage. Stockland recognises that should the City of Wanneroo determine that they do not have the capacity to maintain and manage a proposed asset then the City reserves the right to require the application to show this accordingly.

The proposed playground and all other public amenities including but not limited to applications for play equipment, exercise equipment, outdoor furniture, shelters, structures, BBQ's, drinking fountains and public art will satisfy the following criteria:

- Maintenance thereof is to be within the City's operating budget;
- Replacement thereof is to be within the City's capital works budget;
- Compliance thereof with the Australian Standards and City's safety standards;
- The scale of the playground is to be appropriate to the size of park it is proposed in; and
- The playground provides opportunity for physical and creative play and accommodates for different age groups.

This FMP is based on extensive discussions over almost two years between Stockland and the City and any decision to deviate from the FMP framework should not be made lightly and without reasonable justification by either party.

## 6.1 Key themes and principles

The Amberton FMP establishes the vision for the Amberton foreshore, and addresses the foreshore reserve inclusive of the MRS Parks and Recreation reserve and areas of POS. The FMP has been developed through a collaborative design process incorporating comments from the Amberton project team and various key stakeholders. Like the Eglinton LSP, the FMP and foreshore master plan have been guided by the key themes and principles as outlined in **Section 1.3.**

## 6.2 Design process

As part of the design process, a detailed site analysis was undertaken to identify and understand the environmental, amenity and access factors pertaining to the foreshore reserve. The constraints, issues and opportunities presented by these factors (as outlined in **Section 5**) were then overlain on a base plan and the foreshore master plan developed based on this detailed understanding of the setting.

The Amberton foreshore is proposed to accommodate a local beach and therefore the structures and facilities located within the foreshore reserve are consistent with this level of usage. Nevertheless, access would be provided to the beach at numerous points along the foreshore, in order to provide a coastal connection along the length of the foreshore reserve and in accordance with the Alkimos - Eglinton DSP. Beach access pathways have been largely located on existing tracks with consideration also given to the existing topography, slope and stability.

Future public access, usage and amenity has been concentrated around the southern node (café node), with a number of proposed lookouts at local highpoints. Large event stormwater flood storage areas and passive recreation areas have been strategically located within cleared areas, generally consistent with the Alkimos – Eglinton District Structure Plan (see **Plate 1**).

## 6.3 Foreshore management zones

Foreshore management zones have been created to define revegetation and stabilisation requirements based upon existing site conditions. Within the Amberton foreshore reserve, foreshore management zones have been defined based upon the vegetation condition and vegetation communities of the foreshore reserve, in addition to the results of numerous detailed site inspections. Five management zones were defined for the Amberton foreshore being:

- **Management Zone 1:** "Very Good" condition vegetation. This area requires little revegetation and/or weed control works.
- **Management Zone 2:** Primary dune (OaSI community) in "Degraded" vegetation condition. This primary dune community requires revegetation, minor weed control and some minor stabilisation of the fore dune.
- **Management Zone 3:** "Good" to "Degraded" vegetation condition. These areas require revegetation and weed control.
- **Management Zone 4:** Current access tracks which do not require stabilisation due to the existing topography. These areas require revegetation only.
- **Management Zone 5:** "Completely Degraded" bare areas requiring stabilisation. These areas require revegetation and stabilisation and are generally associated with the steep slopes of dune blow outs.

These management zones are shown in **Figure 9**. The rehabilitation approach for these foreshore management zones is discussed further in **Section 7.3**.

While the Amberton foreshore master plan (as shown in **Figure 10**) sets the general form and layout of the foreshore management approach, a detailed design and documentation process will be undertaken as part of development applications and landscape approval prior to any works being undertaken within the foreshore reserve. Generally, the management of the foreshore is focused on rehabilitation and retention of native vegetation within the foreshore, however accessibility and passive recreation for local residents and visitors is also a key focus of the Amberton FMP and foreshore master plan.

# 7 Foreshore Management and Proposed Facilities

## 7.1 Construction management

The Amberton FMP will be implemented in stages, tied in with adjacent residential development within the Amberton Estate and will occur over a number of years. Staging is discussed specifically in **Section 7.9.**

The Amberton FMP has considered and intends to reduce impacts to native vegetation within the foreshore reserve. To ensure that construction activities do not disturb the existing intact vegetation within the foreshore reserve, limits to construction works will be clearly marked out prior to and during any adjacent civil works being undertaken. Temporary fencing will be used during construction to clearly delineate areas of vegetation to be retained and to prevent earthworks machinery and personnel access into intact native vegetation.

Within the foreshore reserve, UXO searches are proposed to be undertaken only in areas where coastal assets and infrastructure are proposed to be located and these UXO searches will be undertaken prior to construction. UXO searches require the clearing of vegetation and therefore these will be limited to avoid disturbance to native vegetation. Fencing (**Section 7.6.7**) will be used to restrict public access to vegetated areas of the foreshore and to reduce exposure of potential UXO.

Erosion control wind break fencing will be installed along the foreshore interface adjacent to the development site during construction to reduce smothering of vegetation within the foreshore reserve via sand drift from strong easterly winds. This wind break fencing will be consistent with the City of Wanneroo standards (Drawing TS01-11-0).

In addition to temporary construction fencing, environmental management requirements and measures to protect vegetation within the Amberton foreshore reserve will form part of inductions for all construction contractors. A dust and noise management plan will be a requirement of the civil construction contract for any works within or adjacent to the foreshore reserve.

## 7.2 Interface management

Across the foreshore reserve there are several interfaces that need to be managed including the interface between the development and the foreshore reserve as well as interfaces within the foreshore reserve between areas of restoration and/or intact remnant vegetation and passive and active recreation areas that will be formally landscaped.

The Amberton foreshore reserve is delineated by either public open space areas or a local coastal road along the majority of its length. To the southern foreshore reserve, the coastal road is diverted around an elongated public open space which connects the coastal environment into the development. It is important to note that while the Eglinton LSP shows the foreshore road diverting into the foreshore reserve in its northern extent, the actual road alignment has been revised to remain outside the foreshore reserve and also divert around a conservation area adjacent to and contiguous with the foreshore reserve in the northern extent of the foreshore reserve. The final location of the boundary foreshore road in the northern extent of the site is yet to be formally finalised and this will be done separate to this FMP. An indicative road alignment has been shown as part of this FMP.

Changes in levels and grades are anticipated within the foreshore reserve and between the foreshore reserve and the development to varying degrees. Changes in level and grades are required due to the location of the western boundary road and road reserve width as specified within the endorsed Eglinton LSP (**Appendix A**). This is primarily driven by the undulating dunal nature of the landforms in this area.

Some areas within the foreshore reserve will require treatments in order to provide an interface between the road and the undulating foreshore landforms. Given the dynamic nature of the coastal dune landforms and the need to maintain regular and constant grades along the foreshore road, it is not possible to design the foreshore road to entirely tie in with the adjacent foreshore reserve levels/landform and therefore interface treatments are required.

A number of treatments and approaches have been explored in this regard, particularly involving grading (i.e. from the edge of the road reserve level to the adjacent foreshore level) and the use of retaining walls. Neither provide an absolute solution to the foreshore interface, particularly since:

- Grading if used as the sole approach has the potential to impact intact foreshore reserve vegetation and natural landforms.
- Retaining walls if used as the sole approach can create passive surveillance concerns, abrupt boundaries, safety issues, and have higher ongoing maintenance requirements.

It is acknowledged that regrading of the foreshore reserve to address the interface should be avoided in areas with intact foreshore vegetation and landforms.

Generally the final design of the interface treatment proposed will be based upon:

- The extent and quality of native vegetation and the requirement to avoid clearing in areas of "Very Good" condition vegetation.
- The placement of additional areas of POS at various locations along the interface of the foreshore reserve (as opposed to a public road) as the POS can be used to accommodate the change in levels on the development side of the interface.
- The extent of earthworks and dune re-contouring required to stabilise areas of the foreshore reserve in any case without interface works being considered.

The design principles to guide the final detailed design for the foreshore interface (which is likely to be progressed in stages) are:

- Regrading into the foreshore reserve should be considered acceptable where the adjacent foreshore is already significantly disturbed (i.e. in the northern and southern most sections) and there is already a need for significant investment in re-contouring, stabilisation and revegetation of the foreshore reserve area, even without the interface regrading occurring.
- Regrading should not be considered acceptable when this would impact on intact foreshore vegetation in "Very Good" or "Excellent" condition.
- No retaining walls are to be higher than 3 m.
- It will be acceptable to allow for a working area of up to 5 m at the base of retaining walls in order to allow for construction and ensure that the toe of the retaining wall is appropriately integrated into the surrounding landform.
- Any areas disturbed through foreshore reserve interface works (involving either regrading or retaining walls) will be subject to the highest specification for stabilisation (jute matting and intensive revegetation).

Discussions with the City of Wanneroo during the course of finalising this FMP indicate that the City will consider battering into the foreshore in areas of 'Degraded' or 'Completely Degraded' vegetation on the basis that the completed batters and surrounding areas are subject to re-contouring, stabilisation, and revegetation by Stockland. Any imported fill is to be certified fill that is disease and weed-free. Prior to any works commencing, a vegetation survey is to be undertaken by Stockland to determine the degraded areas, to be agreed by the City and the proposed extent of grading and contouring into the degraded area is to be justified by Stockland to the City's approval and satisfaction. In areas where 'Very Good' vegetation occurs at the foreshore interface, the City will not permit any battering into the foreshore. These considerations do not apply to open space areas within the foreshore surrounding the southern node that will be re-contoured to establish landscaped open space and other facilities.

The City has also advised that retaining walls located alongside road reserves, pedestrian access ways and public open spaces shall be minimised wherever possible. If retaining is absolutely necessary, the height shall be limited to 1.5 metres. As per the City of Wanneroo's Local Planning Policy 4.5, the City will consider limited retaining walls up to 3m high subject to variation criteria and subject to Stockland justifying there is no alterative possible. Structural vehicle-impact safety rails or balustrades may be required for safety reasons at the discretion of the City of Wanneroo.

The specific interface treatment for the foreshore reserve, will be finalised through a detailed design process undertaken as part of development and landscape approvals. This process will be staged over the course of the Amberton Estate development project.

*Plate 10 Example of 1:4 grade native vegetated slope at Amberton public open space 1.*

Minor localised regrading to the edge of dual use paths or pedestrian pathways may be required to achieve universal access grades along the paths. These batters will be installed to City of Wanneroo standards and will be managed and rehabilitated with jute matting (where required), mulching, brushing and re-vegetation (see **Plate 10**).

Where necessary, grading will occur in accordance with accepted City of Wanneroo standards for maintenance of slopes (typically 1:6 for grass and 1:4 for shrub planting), disability and access standards and safety standards (including wall fall heights).

Generally, interfaces will be addressed with mortared rock pitching and/or low walling with native rehabilitation planting where possible. However, there may also be opportunities to use grassed interfaces in strategic locations to provide useable play areas and passive recreation areas. This will also assist with safety and passive surveillance.

Separation of the different uses within the foreshore with an appropriate interface or edge treatment will be important to delineate the different uses and functions within the foreshore reserve. Edge treatments will be compatible with the physical conditions and uses of each management zone.

Generally edge treatments will be "hard" and provide a distinct management edge for maintenance and to reduce the spread of turf and weeds into intact vegetation and revegetation areas. Within the Amberton foreshore reserve these interfaces will be formed by pedestrian pathways and in the absence of a pathway, kerbing or other formalised landscape barriers/edges.

## 7.3 Rehabilitation/ecological restoration of historic disturbance

### 7.3.1 Long-term conservation areas

The majority of the foreshore vegetation will be retained, rehabilitated and managed in the long term for conservation purposes. Proposed infrastructure, facilities and passive recreation usage has been deliberately located in historically degraded areas, such as dune blow outs and existing access tracks in order to maximize the retention of existing intact remnant vegetation.

Areas of revegetation and retention are shown in the master plan (**Figure 10**), which will represent conservation areas within the Amberton foreshore reserve. **Figure 11** shows areas of native vegetation which will be retained without any disturbance (and not require significant restoration works) through implementation of the FMP.

### 7.3.2 Invasive environmental weed control

A number of invasive weed species occur within the Amberton foreshore reserve. Weeds often establish in disturbed and degraded areas and invade the adjacent native vegetation and subsequently can impact on the local biodiversity and visual amenity, as well as leading to increased fire risk, erosion, and future management costs.

Weed treatment is not proposed across the entire Amberton foreshore reserve as there are a number of areas with minimal weed invasion where vegetation is in "Very Good" condition. In particular, weed control will be focused on areas targeted for revegetation in order to ensure the highest likelihood of revegetation success or where Declared Weed species are observed. Weeds will largely be controlled chemically with either a selective herbicide (such as glyphosate) or a generic broad spectrum herbicide for significant infestations.

The *Coastal Planning and Management Manual* (WAPC 2003) provides specific management and control methods for common coastal weed species. Given the extensive area of foreshore, weed species are expected to be best controlled using chemical methods.

As outlined in the *Coastal Planning and Management Manual* (WAPC 2003) a three-pronged attack to control and eradicate weeds from the will be necessary to:

- Kill/remove the adults
- Kill newly emerged seedlings
- Block the opportunities for further introduction.

Weed control will take place over a number of years, associated with revegetation works and therefore weeds are expected to be largely controlled before conservation areas are handed over to the City of Wanneroo for management, reducing ongoing maintenance costs. With regards to the foreshore management zones, weed control will be targeted within foreshore management zones 2 and 3. Weeds will be sprayed twice a year (in spring and autumn), with any further localised weed eradication to be carried out as required. The most degraded/disturbed areas of the Amberton foreshore reserve are bare and therefore do not require any weed control.

### 7.3.3 Stabilisation

A large component of the revegetation works will also involve the stabilisation of existing blow outs and dunes. A number of stabilisation techniques will be implemented dependent on the extent of

stabilisation required and the future foreshore land use of the area (i.e. either a conservation or recreation orientation).

Where extensive stabilisation is required, this will be undertaken over a number of stages. Stabilisation will mostly involve soft engineering techniques, such as the use of mulch, brushing, sand trap fencing and jute matting. Brushing sourced from vegetation cleared from within the adjacent development areas will be used, considering the slopes and exposure to winds. However, in some areas, regrading and the contouring of blow out areas will be required in order to create a stable dune form and allow for the establishment of vegetation. An example of stabilisation techniques is shown in **Plate 11**.

*Plate 11 Examples of coastal stabilisation techniques, including brushing, sand trap fencing and jute matting.*

Where grades of slopes are proposed to be greater than 1:4, the City will need to approve the type of stabilisation required and this will be achieved through standard landscape approvals as discussed in **Section 9.1.**

### 7.3.4 Revegetation

Revegetation will be undertaken in disturbed areas that are degraded or bare and will aim to re-establish the native vegetation communities present within the foreshore reserve as outlined in **Table 8**. Revegetation will assist in stabilising exposed dune areas as well as improving biodiversity and native fauna habitat.

Revegetation will use endemic native plants and will incorporate species that have been observed over the foreshore reserve or are known to occur in similar nearby areas. In addition to the species listed in **Table 8**, a number of common native coastal species will be used including *Eremophila glabra, Hemiandra pungens, Jacksonia furcellata, Melaleuca huegelii, Melaleuca cardiophylla, Pithocarpa cordara* and *Templetonia retusa.* Native seed collection has commenced from the Amberton foreshore reserve and will be utilised in areas requiring rehabilitation.

*Table 8 Native species list for revegetation by plant community.*

| SPECIES | PLANT COMMUNITY | | | | |
|---|---|---|---|---|---|
| | OASL | OAASC | ARMS | AC | MSLM |
| *Acacia cochlearis* | | | | | X |
| *Acacia cyclops* | | | | X | |
| *Acacia lasiocarpa* | | | | | X |
| *Acacia rostellifera* | | X | X | | |
| *Acacia truncata* | | X | | | |
| *Acanthocarpus preissii* | | X | X | | |
| *Atriplex cinerea* | | X | X | | |
| *Atriplex isatidea* | | X | | | X |
| *Carpobrotus virescens* | | X | | | |
| *Cassytha racemosa* | X | X | | | |
| *Conostylis candicans* | | X | | | X |
| *Conostylis pauciflora subsp. pauciflora* | | X | X | | X |
| *Desmocladus asper* | | | | | X |
| *Exocarpus sparteus* | | X | X | X | |
| *Hardenbergia comptoniana* | | | X | | X |
| *Kennedia prostrata* | | | | | X |
| *Leucophyta brownii* | | X | | | |
| *Lepidosperma gladiatum* | X | X | | | |
| *Lepidosperma pubisquameum* | | | | | X |
| *Lomandra maritima* | | X | X | | X |
| *Melaleuca systena* | | | X | | X |
| *Myoporum insulare* | | X | X | | |
| *Olearia axillaris* | X | X | X | | X |
| *Phyllanthus calycinus* | | X | X | | |
| *Rhagodia baccata* | | X | X | | X |
| *Santalum acuminatum* | | X | | | X |
| *Scaevola crassifolia* | | X | | | X |
| *Scaevola nitida* | | X | | | X |
| *Spinifex hirsutis* | X | | | | |
| *Spinifex longifolius* | X | X | | | |

| SPECIES | PLANT COMMUNITY | | | | |
|---|---|---|---|---|---|
| | OASL | OAASC | ARMS | AC | MSLM |
| *Spyridium globulosum* | | X | X | | |
| *Threlkeldia diffusa* | | | X | | |

### 7.3.5 Revegetation of earth worked areas

Re-vegetation of earth worked areas will be carried out to ensure that any batters are fully stabilised through both mulching and planting works. For these areas, it is generally recommended that re-vegetation shall be undertaken at a minimum of 4 plants per square metre to provide rapid stabilisation, in addition to either mulching or brushing, seeding works and possible further supplementary planting.

Where slopes cannot be maintained at or below 1:4 grades, jute matting or geotextile may need to be installed to minimize further erosion of slopes. This will ultimately depend on the slope in question and its level of exposure to prevailing winds or uncontrolled access.

### 7.3.6 Summary of revegetation and restoration works

Foreshore management zones (**Figure 9**) have been used to establish the revegetation and restoration requirements based upon the site specific conditions of these areas, including existing vegetation and vegetation condition. A summary of the revegetation and restoration works for the foreshore management zones is shown in **Table 9**.

*Table 9 Summary of revegetation and restoration works*

| FORESHORE MANAGEMENT ZONE | | AREA | STABILISATION | WEED CONTROL | VEGETATION COMMUNITIES | REVEGETATION |
|---|---|---|---|---|---|---|
| 1 | "Very Good" condition vegetation. | 3.4 Ha | Not required | Not required | MsLm | Infill planting as required approximately 2,000 plants/ha |
| 2 | Primary dune (OaSl community) in "Degraded" vegetation condition. | 0.5 Ha | Brushing recommended over approximately 50% of area | Over entire area | OaSl | 10,000 plants/ha |
| 3 | "Good" to "Degraded" vegetation condition. | 3.0 Ha | Not required | Over entire area | Ac<br>OaASc<br>MsLm<br>ArMs | 2,500 plants/ha |
| 4 | Current uncontrolled access tracks which do not require stabilisation due to existing topography. | 0.1 Ha | Not required | Bare area – not required | OaASc<br>MsLm | 10,000 plants/ha |
| 5 | "Completely Degraded" bare areas requiring stabilisation | 3.0 Ha | Entire area requires stabilisation. Mulch recommended over approximately 50% of area. Brushing recommended over approximately 50% of area. Localised regrading to restore landform may be required. | Bare area – not required | OaASc<br>MsLm<br>Ac | 10,000 plants/ha |

Revegetation, like other foreshore works will be subject to a period of maintenance by the developer for five years. Maintenance of the revegetation works will include:

- Ongoing weed control
- Infill planting to replace dead plants.
- Maintenance of revegetation and conservation fencing.

It is acknowledged that this FMP is not a detailed and specific bushland management plan. Prior to each stage of revegetation and restoration progressing, Stockland will submit a specific foreshore restoration works plan to the City of Wanneroo, which will outline/provide:

- The specific area of the foreshore being targeted.
- The key issues currently experienced in the area (i.e. weeds, dune erosion, absence of native vegetation, evidence of pests etc.).
- Detailed foreshore condition mapping.
- Key objectives and specific completion criteria for works (acknowledging that these will differ for different landforms and vegetation communities across the foreshore reserve).
- A species list and planting plan.
- A monitoring and reporting framework.

## 7.4 Fauna management

The Amberton foreshore reserve provides an important north-south fauna linkage through the local area. The retention of intact coastal vegetation plus the revegetation of areas will enable this linkage to be retained and strengthened in the long term. The Amberton FMP includes small areas of landscaping and hard stand, which will be navigable by the majority of fauna species expected to use the foreshore reserve.

Fencing types (as discussed further in **Section 7.6.7**) will generally allow fauna movement through areas of native vegetation and importantly discourage access into areas of native vegetation by dogs. There are a number of native bird, reptile and small mammal species which use the foreshore reserve and restricting access to these areas through fencing, will allow the fauna habitat values to be retained. The use of native species within soft landscaping will also provide fauna habitat value and allow some native species to move between areas of remnant vegetation and through landscaped areas.

Limited lighting is proposed for the Amberton foreshore reserve (only proposed in activity nodes) which will ensure minimal disturbance and allow the natural movement of fauna at night.

## 7.5 Water management and Water Sensitive Urban Design (WSUD)

### 7.5.1 Stormwater management

Stormwater shall be managed in accordance with the following principles:

- Frequent storm events (the 1:1 year Average Recurrence Interval (ARI)) and including 1:10 year ARI) will be directed to vegetated bio-retention swales located entirely outside of the Amberton foreshore reserve.
- In-frequent storm events (for the 1:100 year ARI) will be directed to larger flood storage areas located within POS adjacent to the Amberton foreshore reserve, with some flood storage to be provided within the foreshore reserve.
- Soak wells or open bottom pits will be used to infiltrate stormwater generated from car parking within the foreshore reserve.

Residential areas adjacent to the Amberton foreshore reserve are divided into three separate catchments, and stormwater generated from these areas will firstly be directed to POS areas outside of the foreshore reserve.

Bio-retention swales will be created outside of the Amberton foreshore reserve to treat the 1:1 year ARI, and detention will be provided for up to the 1:10 year ARI event. The bio-retention swales will be vegetated with native sedges to assist with nutrient stripping of stormwater.

1:100 year ARI event flood storage areas are located in "useable" open space adjacent to and also within the Amberton foreshore reserve where a variety of surface treatments such as open turf, low groundcovers and paving will provide amenity. The 1:100 flood storage areas have been located in existing low points, which are historically degraded and have minimal native vegetation.

In accordance with the *State Coastal Planning Policy Guidelines* (WAPC 2013) stormwater retention and/or infiltration areas for major events and overland flow paths onto the beach are permitted, subject to there being minimal adverse impact on the environment, including landform modifications within dune systems. This principle has been accommodated in the Amberton FMP although the majority of

stormwater infiltration areas (and all stormwater treatment areas) are located outside of the foreshore. Where stormwater is proposed to be directed to within the foreshore reserve, this is only for stormwater associated accommodating the 1: 100 year ARI event, which will serve as flood storage areas for water that has already been treated through bio-retention areas outside of the Amberton foreshore reserve.

### 7.5.2 Irrigation management

Irrigation will be required for any newly planted trees, shrub planting and turf in landscaped areas to ensure sufficient establishment at installation and provide a secure ongoing water source for long term maintenance. Rehabilitation planting will not require any form of irrigation if it is planted at the appropriate time of year and irrigation should not be considered for these areas.

It is proposed that the soft landscaped areas within the Amberton foreshore reserve will have a maximum of 33% of the area irrigated permanently, to provide the minimum open space amenity while providing water efficient outcomes. Irrigation application rates and volumes will be calculated and applied in accordance with the Department of Water's *Method to develop the North West Growth Corridor licensing schedule* and local authority standards. The use of irrigation will be minimised and native species will be used within landscaping. An irrigation allocation has been put aside for the foreshore reserve, which will enable the irrigation of turf in the long term to provide passive recreation areas.

Irrigation bores will not be installed within the Amberton foreshore reserve and will be located in adjacent POS areas.

## 7.6 Access

### 7.6.1 Public road interface (foreshore reserve road)

A public road is provided along the majority of the boundary of the Amberton foreshore reserve and the adjacent residential area. This road will provide a clear delineation between the foreshore reserve and land to be privately owned in the future. Additionally this foreshore road will have parking opportunities along its length for adequate parking provision for future foreshore and beach users and visitors. The foreshore road will also provide emergency vehicle access to the southern foreshore node and the beach via a car park and turn around area.

### 7.6.2 Paths and networks

A linear Dual-Use Path (DUP) will be provided along the length of the Amberton foreshore reserve, as shown on the foreshore master plan (**Figure 10**). This DUP will be constructed of red asphalt/poured concrete or a similar product as shown in **Plate 12**. The DUP will also be constructed with an appropriate sub-base to allow for occasional light maintenance vehicle use. The DUP will be 3 m wide, and an additional 0.5 m crushed limestone shoulder will be provided either side to assist with surface drainage and to allow maintenance vehicle access and rest point opportunities for pedestrians. Where the DUP interfaces with the adjacent public road there will be controlled access points with removable bollards inhibiting uncontrolled vehicular access onto the DUP.

The current specified City of Wanneroo requirements for a DUP are as follows:

*All concrete footpaths to be 32MPa concrete with expansion joints every 5m and contraction joints every 1.25m. Concrete dual-use paths are to have expansion joints every 5 m and contraction joints*

*every 2.5m Refer to the City of Wanneroo's Development Design Specification: Cycleway and Pathway Design* (City of Wanneroo 1998).

The DUP will connect with a proposed DUP within Shorehaven immediately south of the Amberton foreshore and will extend through the Amberton foreshore reserve to the Eglinton Estates land immediately north. This will facilitate a continuous DUP being provided through the foreshore reserve through the Alkimos – Eglinton area.

Additional to the DUP, smaller pedestrian pathways will be provided through the Amberton foreshore reserve, providing beach access. The Amberton FMP proposes four access points to the beach, including one emergency access as discussed in **Section 7.6.5** and indicated in the Amberton foreshore master plan (**Figure 10**).

The proposed access network has been located and designed in the first instance with regard for the existing environment/physical setting and regional planning needs. The pathway system will include:

- Elevated boardwalks made from composite timber/plastic decking and substructure.
- 2 m wide sealed pedestrian footpaths with crushed limestone shoulders.
- Composite timber decking or boardwalks at beach landings and viewing points.
- 3 m sealed DUP – to accommodate light maintenance vehicles.
- Pathways may be line marked to assist with pedestrian and cyclist circulation.

Pathway and DUP construction will be consistent with Australian Standard *AS2156.2 Walking Tracks – Infrastructure Design* (Standards Australia 2001a) and Australian Standard *AS1428 Design for Access and Mobility (*Standards Australia 2001b*).*

An elevated boardwalk structure is proposed within areas of high quality native vegetation (vegetation in "Very Good" condition) as shown in **Figure 7**. Compared with pedestrian paths, boardwalks have a reduced clearing footprint, reduce disturbance to native vegetation and reduce impacts from uncontrolled access due to their elevated nature and controlled edge. It is therefore proposed to use these in areas of intact vegetation. Boardwalk structures will also be used in certain circumstances to accommodate changes in elevation, such as steps up to lookouts (see **Plate 13**).

*Plate 12 Example of coastal dual-use path.*

The materials used to construct boardwalk structures will be selected to limit the visual impact of these structures and be constructed from sustainably sourced materials and shall be in accordance with City of Wanneroo's requirements. Boardwalks will ideally be constructed from Wood Plastic Composite (WPC) material. This will aid durability of the boardwalk in this coastal environment. The WPC material shall have the following qualities.

- Contain an anti-slip or textured surface treatment (to be a minimum of R11 anti slip rating).
- Be Ultra Violet (UV) weather stable in preventing/slowing pigment fading or changes.
- Be resistant to food and drink stains (and can be high pressure hosed for cleaning).
- Will not rot, splinter or warp.
- Be of low maintenance/not have continuing upkeep requirements.
- Decking boards and substructure components to have a fibre reinforced resin core for added strength.

An example of a coastal boardwalk is shown in **Plate 13**. An indicative sketch of the boardwalk through the Amberton foreshore reserve is shown in **Plate 14.**

*Plate 13 Example of boardwalk steps for one of the proposed beach access points.*

### 7.6.3 Limiting uncontrolled access

At present, uncontrolled access through the Amberton foreshore reserve is exacerbating dune erosion through the damage and ultimate removal of native vegetation. The management of uncontrolled access will be critical to the successful implementation of the FMP, particularly to any proposed rehabilitation and stabilisation works.

The implementation of the Amberton FMP will facilitate a number of the existing access tracks being closed and rehabilitated. A key component of this rehabilitation will be the initial restriction of access via use of fencing, bollards or limestone boulders. Brushing can also be used as an informal treatment to areas that require restricted access.

Stockland will continue to work with the City of Wanneroo and the local police to reduce uncontrolled access within the foreshore reserve and it is anticipated that with the creation of a larger local community and improved pedestrian access to the Amberton foreshore reserve will inherently assist in reducing the incidences of uncontrolled vehicle access. Signage can also be used to inform users about uncontrolled access.

*Plate 14 Indicative concept sketch of the boardwalk through high quality native vegetation.*

### 7.6.4 Security and lighting

Crime Prevention Through Environmental Design (CPTED) principles have been considered in the foreshore master plan (**Figure 10**) and will be further applied at the detailed design stage to promote community safety. There are three CPTED basic strategies adopted for the foreshore reserve:

- Ensure natural access control to direct access and provide safety measures in activity spaces.
- Ensure passive surveillance created by default as part of the design allowing for improved surveillance opportunities across the scheme.
- Provide territorial reinforcement to create ownership over different spaces.

The use of suitable and site appropriate localised lighting, clear and open sightlines in high use areas, selective planting and thoughtful design will encourage both daytime and evening uses. In addition, suitably graded, selected and designed materials, surfaces and elements will be used throughout public areas to promote personal safety and security.

Currently no lighting is proposed within the Amberton foreshore reserve except for the area immediately around the proposed café node and car park. Designated smaller rest points or areas of boardwalks/decking may be provided with lighting if deemed to be required through detailed design. Galvanised pole top lighting (4.5 m in height) will be provided along segments of DUP directly to the north and south of the café node where the DUP links back to the public road. Standard street lighting will also be present along the public road abutting the Amberton foreshore reserve. The exclusion of lighting to the majority of the Amberton foreshore reserve will discourage access and unsociable behaviour, plus minimise impacts on fauna from light over spill.

The activation of the foreshore reserve through the southern café node, incorporating a small café (as outlined in **Section 7.7.4**) will also provide passive surveillance opportunities, an increased community presence and increased public ownership over areas of the foreshore reserve. The design of this café node will accommodate CPTED principles to reduce crime and antisocial behaviour.

### 7.6.5 Emergency vehicle beach access

Emergency vehicle beach access will be provided at the southern end of the Amberton foreshore reserve (see **Plate 15**). This will involve a wide trafficable pathway down to the beach, with a turn-around area at the beach end for emergency vehicles such as ambulances and/or light fire-fighting appliances. This is the most accessible part of the foreshore for emergency vehicle access based on the current topography of the foreshore as the natural elevations of the fore dunes are lower in this location. Furthermore there is an existing informal four wheel drive beach access in this location and thus will not require major earth working and excessive disturbance to existing foreshore vegetation to facilitate the necessary access design requirements. The emergency vehicle beach access will include revegetation along the edge of the access to stabilise these areas and control windblown sand.

*Plate 15 Concept sketch illustrating the emergency vehicle beach access point.*

### 7.6.6 Universal access

The provision of universal access standards across the Amberton foreshore reserve and into the neighboring communities will encourage and foster an inclusive community ethos. Creation of the pathway network promoting universal access will be factored into the detailed design and implementation of the Amberton FMP. This network will provide clear linkages between the foreshore pathway system, adjoining POS areas and the wider residential development.

The vision of the Walk WA: *A Walking Strategy for Western Australia (2007-2020)* (Government of WA 2007) is that by 2020 Western Australia will be *"a vibrant, safe, accessible place with a supportive walking environment".* In realising this objective the strategy has four main walkability targets and goals that will be facilitated wherever possible as part of the detailed design across the Amberton foreshore, these targets are as follows:

- Access – easy to reach walks and attractive open spaces for people of all physical activity levels and abilities.

- Aesthetics – an environment offering pleasant, clean surroundings in which to walk. The location has a natural or developed attractiveness that encourages people to use it.
- Safety and Security – walkers feeling that they and their belongings are safe. People need to feel that they are well maintained.
- Comfort – walkers can be confident of shelter, conveniences and rest stops. Amenities such as drinking water, seating, shade or shelter must be available.

The proposed emergency beach access will serve a dual purpose in providing an opportunity for wheelchair, disabled and stroller access to the foreshore and beach areas. The provision of a café node in this location (incorporating a small kiosk/café) will enable all users to access these facilities. An example of a universal pathway system is shown in **Plate 16.**

*Plate 16 Example of a universal pathway system with shallow gradients over existing landform*

### 7.6.7 Fencing

Fencing will be used within the Amberton foreshore reserve to restrict access to intended areas. All pathways will be fenced to restrict access in order to reduce impacts on native vegetation and revegetation. In addition, fencing will restrict access by dogs, which can be a significant threat in the urban environment to ground-dwelling birds and mammals.

All fencing will be generally in accordance with the City of Wanneroo's fencing requirements (Drawing, TS01-4-01 and TS01-7-1), or other City of Wanneroo standards. Base design criteria for fencing shall be as follows:

- Total fence height to be 1225 mm, with 900 mm being ring locked fence and 335 mm being galvanized PVC coated plain wires.
- Upright supports shall consist of timber posts and no pickets.
- Maintenance access gate provision shall be provided at the required intervals to the various maintenance zones within the Amberton foreshore reserve. These shall be incorporated into the fencing design to the City of Wanneroo standards and be wide enough to allow maintenance vehicle access as required.

- Timber bollards or removable bollards in certain locations will be centrally located to pathways to restrict vehicle access.

Alternative fencing types may be required in areas in beach access areas, high traffic areas or adjacent to a public road or car park. The specific fencing type will be discussed with the City of Wanneroo as part of the detailed approval process and will be consistent with the fencing that the City of Wanneroo has installed in other coastal areas.

### 7.6.8 Connectivity to adjoining areas

The Amberton foreshore reserve node and connecting pathways will form part of the greater Alkimos Eglinton foreshore access and amenity. The DUP will connect to a similar DUP within the Shorehaven development to the south and the proposed Eglinton development and marina to the north. The DUP will provide an important north – south connection through the foreshore reserve. This connection is shown on the Amberton foreshore master plan (**Figure 10**).

DUPs will also connect to the greater east west greenlink through the northern portion of the Amberton development, where areas of conservation public open space occur.

## 7.7 Beaches access and use

Amberton is 8 km from Yanchep Surf Life Saving Club (SLSC) to the north and 7.5 km from Quinns Mindarie SLSC to the south, which are the closest existing SLSC facilities.

Stockland engaged Surf Life Saving Western Australia (SLSWA) to undertake a Coastal Aquatic Risk Assessment (CARA) (**Appendix C**) with the primary aim of determining if swimming/wading activities were suitable at beaches within the Amberton foreshore reserve and secondly the most suitable location designated as a recreational and leisure beach. The CARA also provides an assessment of the coastal risks present at Amberton Beach and provides a risk management plan and recommends treatments including beach accessibility, access signage, lifesaving services and awareness and education.

The CARA report notes the following features of the beach:

- Beaches are backed by 10 m to 20 m high primary dunes along its length with a number of blowouts in degraded areas.
- Beach widths along the length range from 30 m to 80 m although some sections are narrower than this.
- The beach is relatively sandy with some exposed beach rock/platforms along the northern section toward and beyond Pipidinny beach.
- Some rock is present in the intertidal or on the shore, particularly in the central section.
- Sea grass meadows and outer reefs sit adjacent to the intertidal areas.
- The outer reefs reduce the onshore influence of swell but create a moderately steep beach face and under certain low tide conditions the onshore beach areas are prone to rips.

The CARA assessed the Amberton beach as a “moderately hazardous” beach, with an average hazard rating of four out of a maximum of 10. Moderately hazardous beaches are where “the level of hazard depends on the wave and weather conditions, with the possibility of strong rips and currents proposing a moderate risk”.

The CARA provided a number of recommendations for the Amberton foreshore and beach (and wider area) including:

- Providing beach access and public amenity. SLSWA recommended that the southern area of the Amberton foreshore is the most "friendly" to a range of beach users based upon user competency and user experience.
- Provision of safety signage. SLSWA recommend that suitable signage needs to be put in place including information on beach and aquatic safety signage and general locational and information signage.
- Education and awareness program. SLSWA suggest that an education and awareness program is developed with Stockland and the City of Wanneroo in order to mitigate risks at aquatic coastal locations.
- As beach visitation rates increase, a lifesaving and surveillance outpost could be accommodated at Amberton beach co-located with the proposed café and connected to the proposed Shorehaven Surf Lifesaving Club.

### 7.7.1 Proposed Amberton swimming beach

As outlined in the CARA (see **Appendix C**) SLSWA noted that the southernmost boundary of the Amberton foreshore reserve is likely to present the best area in which to guide beach users for entry to the beach and participation in aquatic activity. This section of beach has more of a gradual gradient from the swash zone into the surf line. These features provide a more favourable depth for a greater distance before dropping away into deeper water.

Furthermore, the CARA noted that the best location for a beach emergency access track was located to the south near the allocated swimming area, where reduced dune heights permit construction of a vehicle access track. This is reflected in the Amberton foreshore reserve master plan (**Figure 10**) and has been a key consideration in the design and siting of facilities (including the café node) within the Amberton foreshore reserve master plan.

### 7.7.2 Dog beach

A dog beach was proposed in the Alkimos – Eglinton District Structure Plan for the southern portion of the foreshore reserve. Within the City of Wanneroo's *Draft Coastal Management Plan* (2012), a dog beach is proposed for 100 m south of the Amberton foreshore reserve, within the Shorehaven development. We understand that planning for this dog beach has recently commenced with the City of Wanneroo and Peet (the developer of Shorehaven). It is expected that specific facilities associated with the dog beach will be provided within Shorehaven, consistent with the City of Wanneroo's *Draft Coastal Management Plan* (2012).

Amberton is not expected to provide the primary access to the dog beach, which will be accessed through Shorehaven. However, dog beach users may access the dog beach from Amberton and as such appropriate signage will be provided to direct dog beach users to the Shorehaven dog beach. Dog specific infrastructure (dog bin bags located with bins) may also be provided at the direction of the City of Wanneroo.

### 7.7.3 Foreshore reserve amenities and structures

To provide adequate foreshore facilities for the community, selected areas of the foreshore have been allocated for public amenity and passive recreation. Generally speaking, these structures have been

included within existing degraded areas of the foreshore reserve. Such amenity and facilities are provided to ensure the minimum standards for the following are provided:

- Universal access to the Amberton foreshore reserve, beach front and adjacent open space.
- Resting points and areas of respite.
- General shelter with low level solar lighting.
- Visual surveillance.

These areas will incorporate a combination of hard and soft landscape treatments such as:

- Hard landscape treatments:
  - Hard pavements such as concrete, asphalt or unit paving to provide safe pathways
  - Asphalt car parking and road infrastructure (for public access and emergency access)
  - Retaining walls, dividing walls or concrete edging to define designated public access
  - Fencing to prevent undesired access to dunes and direct pedestrian movement
  - Boardwalks, decking or light weight structures to viewing areas that will have a minimal impact on the landform and vegetation
  - Shade structures, play equipment and general foreshore facilities to encourage community use and gatherings.
- Soft landscape treatments:
  - Native and water wise tree and shrub planting to provide shade and wind protection
  - Low native groundcovers to assist with passive surveillance of key areas
  - Rehabilitation native planting to degraded areas
  - Roll on turf (kikuyu) to designated active recreation areas (for people and pets).

Specific structures proposed such as shade shelters, boardwalks and seating are generally considered to be "coastally dependent and easily relocatable development" in accordance with the definition of the 2013 SCPP. In this sense, it is appropriate and reasonable for these structures to be located within the foreshore reserve. The acceptability of locating assets and infrastructure within the Amberton foreshore reserve (and the coastal processes setback) is discussed as part of the Coastal Hazard Risk Management Adaptation Plan in **Section 10.**

Information on specific facilities and structure is detailed in the sections below.

### 7.7.4 Café node

#### *7.7.4.1 Café node intent*

Consistent with the Alkimos Eglinton DSP and the LSP, a central community node (café node) is planned within the Amberton foreshore reserve (see **Figure 10**) and shall provide the primary focus for community activities and access within the wider foreshore reserve. The café node will provide an important public benefit within coastal areas, as these are frequently associated in proximity to the ocean, generally with ocean views.

A small relocatable café facility is proposed for the café node. It is the intention that this café takes advantage of ocean views from its nestled position in the dunes towards the north and west.

Adjacent to the café shall be an informal open recreational landscaped area as well as access to a boardwalk beach access route.

#### *7.7.4.2 Café node location*

The Café node has been strategically placed:

- To be adjacent the swimming beach identified by SLSWA.
- To occur in a heavily disturbed area of foreshore with little intact vegetation, which would require a high degree of modification and stabilisation if the café was not proposed.
- To allow an area of passive recreation to be created with a microclimate that is protected from prevailing summer winds during periods of peak patronage.
- In close proximity to the existing uncontrolled beach vehicle access point which will form the proposed emergency vehicle beach access.
- At the confluence of a large park and a broader east-west green link leading into the adjacent residential precinct. It is therefore a natural meeting point of several pathway networks in particular the north - south DUP axis and the east - west pathways from the development to the beach.
- To enable the café building to take advantage of existing cleared and level natural high points within the dune system with sweeping beach views for surveillance.

Examples of coastal nodes are shown in **Plate 17** and **Plate 18**.

The exact location of the proposed café facility will be subject to a detailed site survey and will depend on the footprint and design of the final structure. The café facility will be subject to a specific Development Approval and will be discussed further in detail leading up to that time with the City of Wanneroo.

The café location and design is conceptual and subject to further detailed design and planning to the satisfaction of the City of Wanneroo. The following conditions of any future approval are to be established in conjunction with the City of Wanneroo:

- Approval is time limited.
- All temporary assets must be removed upon expiry of the approval unless agreed with the City otherwise.
- Any associated infrastructure directly associated with the café, such as lighting and pathways are also temporary in nature.
- Stockland will ensure that the community is aware of the asset's temporary nature.

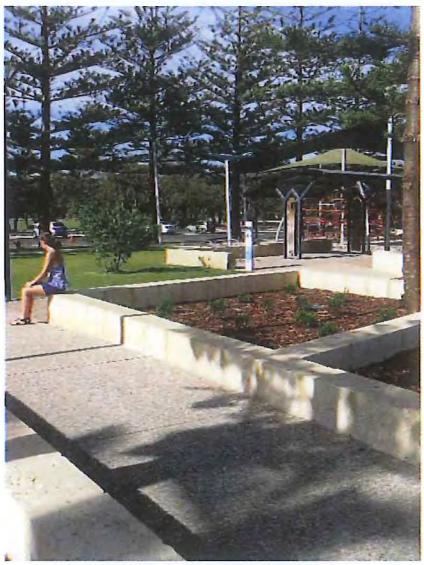

*Plate 17 Busselton Foreshore (left) and Jindalee Foreshore (right), both nodes with passive recreation and supporting small business opportunities.*

*Plate 18 Burns Beach node with passive recreation space, lookouts and shelters.*

### *7.7.4.3 Café node patronage*

Intended future users of the Café node will be the general public. Community groups and residents alike will be able to use the informal landscape areas and the café building for their passive recreational needs and take advantage of the afforded sea views. DUP users from the neighboring communities shall be encouraged to use the facilities provided within the Café node in promoting inclusive community awareness and initiatives. Local residents and other foreshore users will also be able to access the swimming beach directly via a boardwalk and proposed emergency vehicle beach access from the café node.

#### *7.7.4.4 Café node design*

The café building location has been selected specifically because of its elevation to capture views over the dunes to the ocean and in an area that minimises modification to the landscape/landform which has been subject to historic modification and degradation.

The café building design will incorporate passive solar principles to reduce the energy requirements of the café. This is expected to include:

- Open plan internal layout and glazing to ensure maximum passive lighting and ventilation.
- Bi-fold doors to maximise external amenity of location.
- A lightweight structure to be insulated to mitigate internal heating in summer.
- Glazing to be appropriately rated for insulation.
- Contemporary flat (skillion) roof to maximise internal roof space for ventilation and opportunities for glazing facing the ocean, and to minimise visual impact/blocking of views from adjacent areas.

The café building design may also incorporate rainwater tanks for toilet flushing and solar panels (or wind generators) for energy generation.

It is anticipated that the café building will be on the DUP route and have ancillary public toilet facilities which will also service the public.

The café node may also include the following facilities:

- Car park.
- Playground.
- BBQs.
- Directional, safety and interpretative signage.
- Exposed aggregate, asphalt or poured concrete paving.
- Shelters/shade structures.
- Beach shower and foot tap, with drink fountain, or dog tap.
- WPC decking or boardwalks with viewing areas.
- Bicycle racks.
- Litter bins/dog bins/refuse collectors.
- Standard fencing to restrict access, with possible feature balustrade at viewing areas.
- Feature picket style fencing or artwork.
- Masonry retaining or freestanding walls.
- Rest point/seating opportunities.

The specific facilities located within the café node would be subject to detailed design and approval by the City of Wanneroo. The proposed playground and all other public amenities including but not limited to play equipment, exercise equipment, outdoor furniture, shelters, structures, BBQ's, drinking fountains and public art will satisfy the following criteria:

- Maintenance is to be within the City's operating budget.
- Replacement is to be within the City's capital works budget.
- Compliance with the Australian Standards and City of Wanneroo's safety standards.
- The scale of the playground is to be appropriate to the size of park it is proposed in.
- The playground provides opportunity for physical and creative play and accommodates for different age groups.

#### *7.7.4.5 Café building*

The construction of the café building will use a modular and prefabricated approach in order to minimise the extent of earthworks and also the construction footprint. The café building and associated public toilet facilities will be constructed from robust outdoor materials suitable for coastal conditions. This may include galvanised steel structural elements, rust free aluminium or timber framing, HDPE plastic battens, hot dipped galvanized fixings and stirrups, double glazed glass and aluminium framed windows and galvanized reinforced concrete stump footings rather than slab construction. The colour scheme will be consistent with the natural colours of the coastal landscape. All materials and design will be subject to further consultation with the City of Wanneroo at the detailed design stage.

Installation works will be controlled by future construction drawings and specification clauses as part of future detailed design with the intention of limiting clearing, limiting and control working access, outlining possible penalties and ensuring stabilisation to locally disturbed areas post installation.

Due to the light framed construction method, a probable lifespan for the building would be between 30 and 40 years. Some aspects of building maintenance are expected to rest with the café operator and it would not be unusual for the building owner to meet some of the insurance obligations. Examples of similar light framed construction buildings are shown in **Plate 19**.

#### *7.7.4.6 Café facility tenure/lease arrangement*

Based on discussions with the City of Wanneroo there are two tenure arrangements that could be pursued to facilitate the café within the foreshore reserve, which are:

- A crown reserve that is leased for the creation and operation of a cafe.
- A residual portion of freehold land that is only retained by Stockland for the period of time the cafe is operational under the relevant approval.

The first option involves creating a small separate reserve within the Amberton foreshore reserve to allow for the servicing, construction and contract leasing arrangement for the café building. This lot will need to be vested to the Crown and as for the current Jindalee café the reserve would be Crown land managed by the City for Recreation and Cafe purposes with the power to lease and license as a minimum requirement. A strategy for the café site to be relocated due to shoreline recession (inclusive of sea level rise) is discussed in **Section 10.**

The lease would be held by a private third party and initially this is expected to be Stockland. Stockland would construct and establish the café but then may seek an operator to manage the facility in the longer term. The lease duration would reflect the relocatable nature of the café (i.e. initially a 10 year lease with 10 year extension options), and specifically be in place at least until the nearby Eglinton marina is constructed.

The lease would carry a condition to fully decommission the site at the termination. A bond would be put in the place to enable the structure to be relocated or decommissioned if these works were unable to be undertaken by the leaseholder.

The second option would involve leaving the relevant portion of land as freehold land in Stockland ownership, along with the cafe facility and associated infrastructure, and is also the head lessor for the lease to a third party. The City of Wanneroo has indicated it may be interested in entering into a deed of agreement to take on the land at the end of the cafe term to utilise the land for recreation.

The preferable servicing strategy would be to have the café serviced through the creation of this lot (either as a reserve or residual freehold land) and services (communications, water and power) to be metered separately for each structure. Gas could be provided through replaceable bottles where necessary and wastewater could be managed via a standalone self-contained pump out waste management facility or onsite effluent disposal system (such as an Aerobic Treatment Unit).

Café car parking can be accommodated by the proposed public car park, however there would be a strong emphasis for residents to walk or cycle to the café.

As outlined in **Section 7.7.4.2,** the café will be subject to a Development Approval and the design, location, lease and tenure arrangements are expected to be discussed and agreed with the City of Wanneroo prior to this time.

#### *7.7.4.7 Café node operators expectations*

There may be a commercial arrangement between the existing landowner (Stockland), Council and the first operator of the café. Any leasing agreement will need to contain lease terms and timing to provide regular review and assessment should there be major adverse coastal shoreline recession. It would require that responses and management must be in place for the following:

- Major storm events.
- Major adverse changes to the coastline, seas level rise etc.
- Major erosion of existing dune systems.
- Business viability due to future competition.

The lease arrangement will include a clause to remove the café structure and restore the site following termination of the lease. As outlined above, a bond is expected to be provided as a condition of the lease arrangement which can be accessed by the City of Wanneroo to facilitate café removal/relocation as a last resort.

As discussed above, a strategy to address changes to the foreshore over time and potential impacts on the coastal node is discussed in **Section 10**.