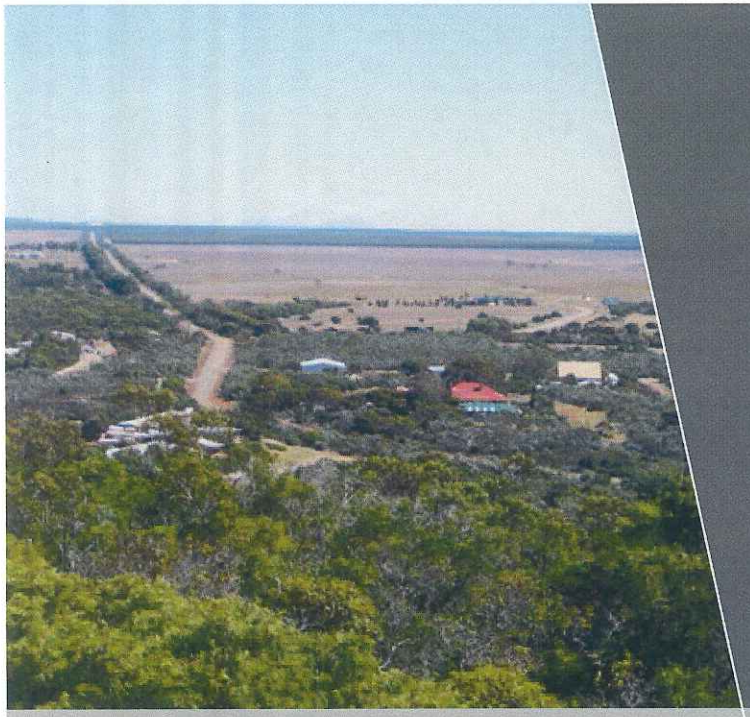
Cardno
Shaping the Future



Bremer Bay

Town Centre

structure plan report - P11002

Prepared for LandCorp
Shire of Jerramungup

February 2015

clients

LANDCORP

prepared in conjunction with

donaldson+warn

TACTICS4

Porter
Consulting Engineers

STRATEGEN

ENDORSEMENT

CERTIFIED THAT THIS STRUCTURE PLAN WAS ADOPTED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

4/5/15 ..... Date

Signed for and on behalf of the Western Australian Planning Commission

.....

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

..... Witness

Melinda Lyons

4/5/15 ..... Date

And by

RESOLUTION OF THE COUNCIL OF THE SHIRE OF JERRAMUNGUP ON

18th April 2012 ..... Date

And

PURSUANT TO THE COUNCIL'S RESOLUTION HEREUNTO AFFIXED IN THE PRESENCE OF:

.....

Mayor/President, Shire of Jerramungup

.....

Chief Executive Officer, Shire of Jerramungup

SHIRE OF JERRAMUNGUP COMMON SEAL

30 march 2015 ..... Date

This Structure Plan is prepared under the provisions of the Shire Jerramungup Local Planning Scheme No.2

DATE OF EXPIRY: 19 OCTOBER 2035

EXHIBIT COBA

CONTENTS

1.0 INTRODUCTION

1.1 OVERVIEW

This Structure Plan report has been prepared by Cardno in collaboration with Donaldson+Warn Architects , Taktics4, Strategen and Porter Consulting Engineers on behalf of LandCorp and the Shire of Jerramungup.

The Plan provides strategic direction for the future development of the new Bremer Bay Town Centre at Reserve 31611, Lot 135 John Street Bremer Bay, bounded by Borden-Bremer Bay Road, Garnett Road and John Street. The preparation of the Structure Plan has involved an integrated process of investigation, consultation and collaboration. The method used for preparing the Structure Plan involved comprehensive analysis and site investigations by the project team, comprising land use planners, landscape architects, architects, environmental consultants, engineering consultants and a retail consultant.

1.2 BACKGROUND

Bremer Bay is located on the south coast, approximately 180km east of Albany. Bremer Bay is a beautiful coastal town that offers numerous recreational pursuits for residents and visitors. The town has a primary school, general store, resource centre, health centre and a sports club/golf course, FESA facilities with several businesses also operating along Gnornbup Terrace. Visitors are accommodated in the two caravan parks and the Bremer Bay Resort. To the east of Bremer Bay is the Fitzgerald River National Park which contains 20% (1,800 species) of the state's described plant species and is one of the most diverse botanical regions in the world.

Although Bremer Bay is a relatively small town comprising approximately 210 permanent residents, the town experiences a significant influx of tourist during the holiday periods. Figures recorded by the Council indicate the total number of occupancies in the caravan parks and camping grounds exceed 20,000 per month.

There have been a number of scheme amendments over the last few years for new small scale rural residential areas near Point Henry, a new planned Industrial zone to the west of Bremer Bay and the recent subdivision and construction of residential land immediately west of the proposed Bremer Bay Town Centre.

The main industries for residents include agriculture, fishing and tourism. The potential development of the Southdown magnetite mineral deposit (near Wellstead), 90km to the west of Bremer Bay, has the potential to substantially increase the resident population of Bremer Bay and provide an alternate location for mine workers, by offering a different lifestyle and recreations opportunities to the regional centre of Albany.

In December 2008, the Elected Members and Executive Team of the Shire of Jerramungup prepared a strategic plan for the period of 2009-2014. Part of the strategic planning process identified the development of the Bremer Bay Town Centre as a key strategic project for the Shire.

The planning and development of a town centre for Bremer Bay has been discussed for several years and has been identified as a driver in terms of supporting and encouraging growth from a population and economic perspective, in particular providing appropriately zoned land to facilitate commercial development to enhance business and employment opportunities and providing existing and future residents with an improved level of amenity, choice and convenience.

To progress the future planning for the Town Centre, a Structure Plan was originally prepared in 2010. The plan was submitted to referral agencies for public comment and placed on public notification. Several submissions were received and it was noted that the plan needed refinement.

In 2011, a consultant team was appointed by LandCorp on behalf of the Shire of Jerramungup. The team comprised town planners, landscape architects, architects, an engineer, environmental consultants and a retail consultant which revisited the work completed in 2010 and re-examined the community and referral agency comments raised during earlier consultation regarding the issues, opportunities and constraints facing the development of the town centre. In particular, the following key aspects were identified:

- Providing facilities that complement and reinforce the service function of the town and ensuring the scale and types of activities are commensurate with the existing and future population;
- The land earmarked for the town centre contains a significant number of signature species found in the Fitzgerald River National Park. With careful design and planning the botanical story can be brought into the foreground or 'front yard' of the town centre development;
- Opportunity for the design of the town centre to capitalise on views and relate to the topography of the site and the greater landscape;
- Opportunity to strengthen road connections between new and existing development and create a sense of arrival to Bremer Bay; and
- Opportunity for the town centre to rationalise parking and improve accessibility (i.e. provide for cars with caravans).

1.3 PREVIOUS PLANS

In 2010, Gray and Lewis Consultants were commissioned by the Shire of Jerramungup to prepare a Structure Plan which formed the starting point for Council and community input into the future planning for the Bremer Bay Town Centre to enable discussion, debate and refinement of the uses for this area.

The 2010 Structure Plan was intended as a working document requiring input from the Council, community and key stakeholders. The Structure Plan and two development concepts prepared by Gray and Lewis were advertised and a total of 33 submissions were received from the local community, key stakeholders and referral agencies. The main areas addressed in the submissions were identified as follows:

- Several submissions considered the designs ignored the site contours, the presence of sensitive and important vegetation and the possibility of achieving a 'sense of arrival'.
- There was strong support for the retention of the remnant vegetation located on the eastern portion of the Reserve which many submitters felt was not adequately addressed in the designs prepared. Several submissions recommended appropriate areas of remnant vegetation be incorporated within the development as an integral part for environmental, aesthetic, quality and commercial reasons and as a reflection of Bremer Bay's part in the Fitzgerald Biosphere.
- Several submissions strongly encouraged sensitive and sustainable environmental design and integrated management systems.
- The design options proposed commercial floorspace that was considered not commensurate with the existing and future population.
- Bremer Bay townsite is located at a pinch point in the wider vegetation macro-corridors The subject site provides a key linkage between Reserve 511 and the Unallocated Crown Land to the north of the Primary School. Current environmental studies fail to consider the regional values of the vegetation on site. Recommendation that at least some of the remnant vegetation be retained with a maximum width to limit 'edge effects'.
- The development concepts should give consideration to the town centre plan extending to Gnornbup Terrace to the south as a way of integrating the existing land uses into the concept plan, providing greater connectivity between north and south of Borden- Bremer Bay Road, and as a mechanism to integrate and upgrade the existing Gnornbup Terrace verges and streetscape.
- Several submissions questioned the appropriateness of the proposed R30 lots with rear laneway access.

1.4 DESIGN PROCESS AND APPROACH

The design team as part of the analysis and background investigation phase of this project undertook extensive review of the 2010 Structure Plan, supporting background reports and submissions received during the consultation period. The consultant team also undertook several site visits to familiarise themselves with the subject site and test subsequent design options prepared for the new Town Centre. An informal community consultation forum was held in April 2011 to discuss the project with the community and garner ideas and feedback prior to developing and refining options for the site.

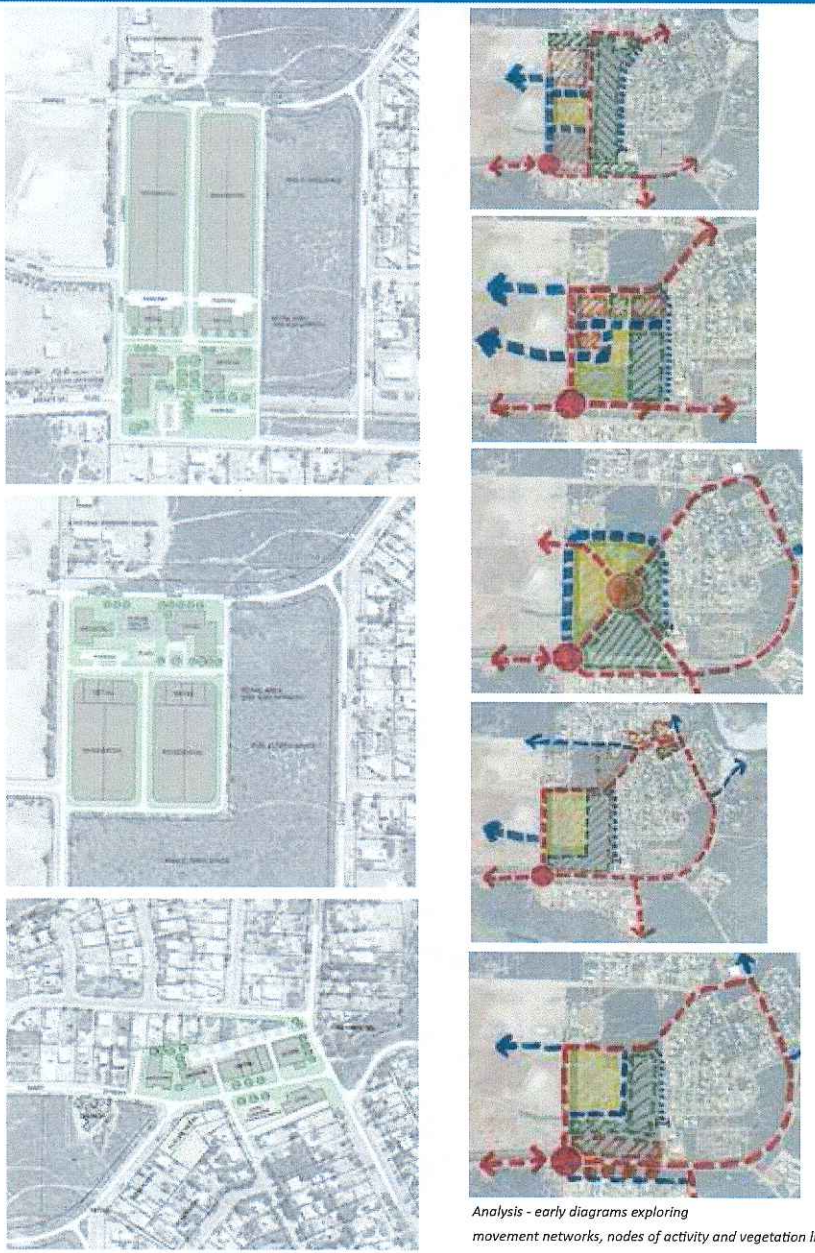
This Structure Plan was also informed by the preparation of a retail demand strategy prepared by Taktics4 which assessed the retail potential in Bremer Bay under a range of potential growth scenarios and commercial influences and economic implications of creating a town centre in Bremer Bay. The findings and recommendations of this analysis was used to underpin some of the recommendations made regarding the location of the retail core and size of the retail and commercial floorspace.

During the design phase of this project, several options were prepared for the subject site taking into consideration the site's opportunities and constraints (environmental, engineering, topography and views etc), project objectives as discussed in Section 2.0 of this Report and Council aspirations. The consultant team analysed previous opportunities and constraints mapping prepared by Harley Global (Figure 1), prepared several options over the subject land and also considered the redevelopment of the area surrounding the existing general store which is currently performing a pseudo 'town centre' role.

The main design parameters investigated are discussed below. These were presented at an Elected Members Briefing Session in June 2011 and at a Community Consultation Forum in October 2011.

1.0 INTRODUCTION

DESIGN OPTION	COMMENTARY
'Main Street' fronting Borden-Bremer Bay Road	This option explored the idea of integrating the 'main street' with the activities along Gnornbup Terrace and utilising portion of the Borden-Bremer Bay Road reserve for development. This option was chosen for further refinement and testing in discussion with Council and key stakeholders and forms the basis of the preferred option. It was determined during the testing stage that the costs to relocate the services under the Borden-Bremer Bay Road reserve would be too cost prohibitive. The design team was asked refine this option to investigate 'stretching the main street' and front ing retail development onto Borden Bremer Bay Road as well as a new 'Main Street'. Provide space for a health campus, police station, future civic uses and visitors centre, provide a link to Gnornbup Terrace to assist in consolidating the commercial spaces and highlight the existing ecological corridor and bring the natural environment into the development as an intrinsic element of the proposed Main Street.
'Main Street' adjacent Primary School	Although this design had some merit with the potential to create a symbiotic relationship with the existing civic uses i.e. school and church with the possibility of generating critical mass of uses and patronage, it was considered that this option did not satisfy the overall project objectives and vision.
Reconfiguration of Mary Street around General Store and surrounds.	The design team felt it warranted the review and investigation of reconfiguring the land surrounding the existing general store. It was determined during the course of discussion with Council and key stakeholders and the testing phase that this option was physically constrained and did not satisfy the overall project objectives and vision.



Analysis - early diagrams exploring movement networks, nodes of activity and vegetation links

OPPORTUNITY AND CONSTRAINTS PLAN

SHIRE OF JERRAMUNGUP
8 Vasey Street
Jerramungup WA 6337
Office Hours
Monday to Friday: 8am-4pm
Phone enquiries: 8am-4:30pm
Ph: 08 9835 1022

CONSTRAINTS

Drainage

Site is split into two catchments.
Clay soils making on-site disposal difficult
Drainage issues from the wider catchment affects northern part of site.

Environment

Cold south westerly winter winds & hot north easterly summer breezes
Steep land in the north eastern corner
Good quality vegetation on the site recognised by study
Pinch point in the wider marco-corridor
No declared rare flora but a Priority 2 species present
Clay soils

Urban Form

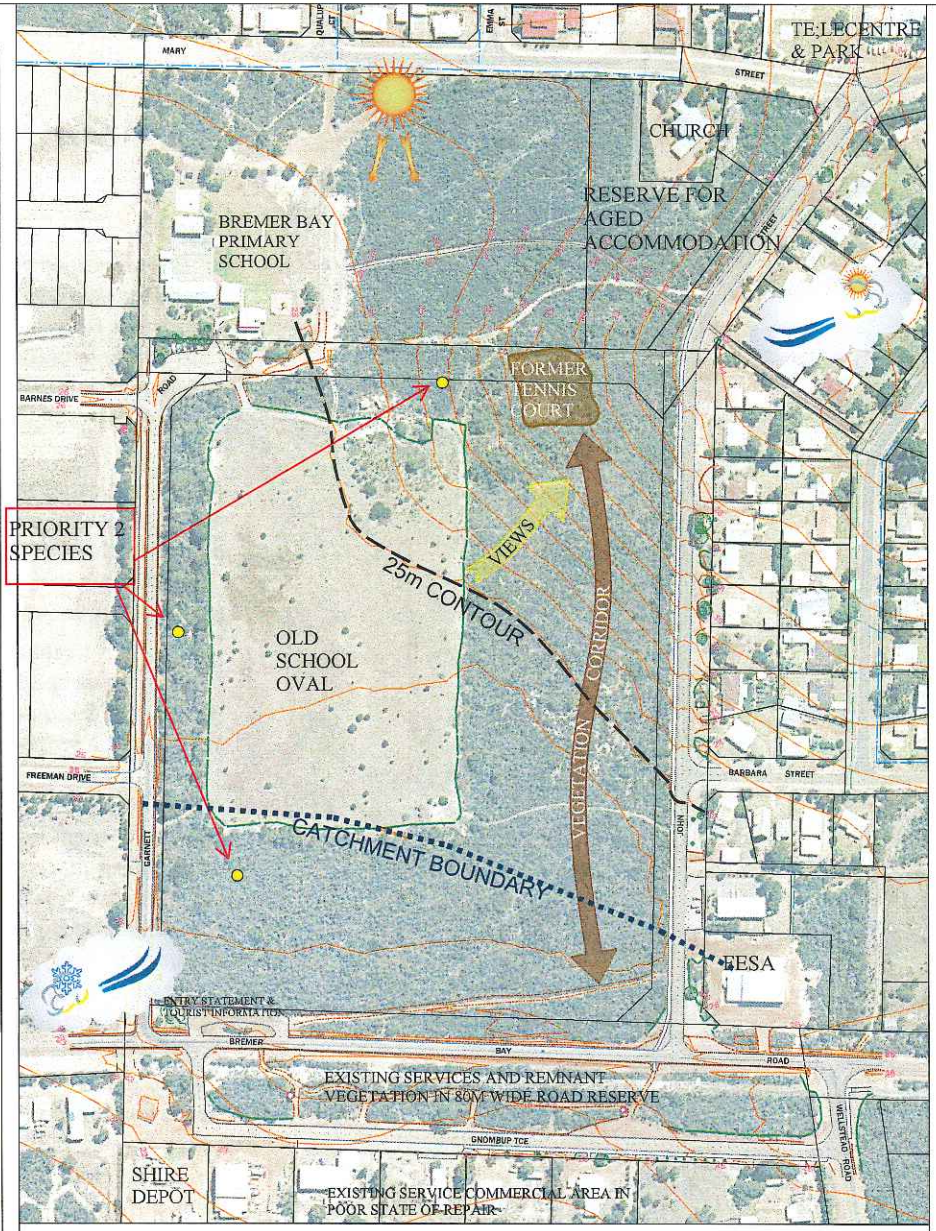
Existing urban form scattered. Service Station and service commercial area in Gnombup Terrace screened by vegetation
Shop, tavern and Gnombup Terrace that would normally be centrally located and form part of a 'Main Street' are spread out
Town Centre site is not located central to the remainder of the existing townsite.
No discernable town centre which means no place to orientate yourself as a visitor or place to go for information. No single community meeting place.
Poor quality development in Gnombup Terrace
Main services (water, power & sewer) run through Bremer Bay Road road reserve
Some communications infrastructure at the northern end of the subject site

Traffic

Bremer Bay Road takes traffic straight past subject site at speed.
Site is blocked from the rest of town by the Primary school reserve and other adjacent reserves.
John Street-Mary Street intersection is inadequate
Traffic is drawn down past the shop to the Bennett & Mary Street intersection that is not designed for high volumes of traffic.

Scheme

Site is zoned Special Site with a limited number of land uses. Ideally a rezoning is needed to facilitate the full development of the land.



SCALE AT A3 1:3000

0 25 50 75 100 125 150

ALL DISTANCES ARE IN METRES

notes:
This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Drw No 14673-08A.dgn Drawn ABS 01/10/10

harley global

www.harleyglobal.com.au

Surveying | Town Planning | Development Consultancy

OPPORTUNITIES

Views

Use topography to maximise views. No other main street in WA has access to views like Bremer Bay's.
Use the slope of land, particularly the 25m contour line as this is the line where significant development has occurred elsewhere in Bremer Bay. Such as the telegraph station, Tavern and school.
Use the slope to ensure the rest of town can see and therefore more strongly associate with the town centre.

Environment

Use the existing vegetation to highlight the natural environment in town for locals and visitors.
Establish an ecological corridor through the site for the movement of fauna and security of flora species
Utilise vegetation as wind breaks
Sandier soils in the north eastern portion of the site
The vegetation corridor has opportunities for footpath networks to link the Main Street to the rest of town.
Can extend formal reserve network through the site, securing native vegetation in perpetuity.

Urban Form

The existing development in Gnombup Terrace can contribute to the town centre.
Council has control of wide road reserves and nearby reserves that may be used for drainage purposes.
Lack of aged accommodation in town, there is an opportunity to provide sites to allow the community options to age in place.
Investigations with education Department have provided 'in principle' agreement to change the shape of the school reserve.
Greenfield site of a regular shape that offers potential for design to maximise access to winter sunlight to the north.
Place to provide a terminus for the Bremer Bay to Hopetoun walk trail, tourist centre, Westrail bus terminus, weekend markets, etc
Medium Density development will offer low maintenance options to aged persons, holiday accommodation, mine workers, etc and offer another option not available in town.
Medium density development to access views to make increase viability.

1.0 INTRODUCTION

1.5 ENVIRONMENTAL ASPECTS

Strategen has completed a preliminary Environmental Site Investigation Report (March 2012) with documents the following key findings:

Topography, geology and soils

- The development of the site is anticipated to be sewered. The site appears to be generally suitable for sewered development from a geotechnical perspective.
- The hydraulic conductivity of the local soils is poor. Infiltration on site is likely to be limited, which may be a constraint for the use of infiltration on site for stormwater management and on site disposal of wastewater. Drainage management on the site will need to consider the implications of low infiltration rates. Some forms of stormwater disposal, such as soakwells, may not be feasible or will require the installation of a sand layer to enhance infiltration. These issues will be addressed in the Local Water Management Strategy (LWMS).
- Acid sulphate soils are considered unlikely to occur on the site. No additional work is anticipated to be required to address this issue.
- It is recommended that the telecommunications facility be investigated for the presence of asbestos and potential sources of contamination prior to demolition. This should include discussions with Telstra regarding the history of the site and potential use or storage of contaminated materials on the site.

Surface water

No significant surface water features are located on the site. The majority of the site drains in a northeasterly direction, towards the corner of John Street and the unmade Garnett Road. The southern portion of the site drains in a southerly direction, towards Gnornbup Terrace. The Wellstead Estuary is located approximately 500 m north of the site.

Flora

- The current concept for the development has been designed to keep vegetation clearing to the minimum required to allow construction of the town site facilities. New disturbance will comprise approximately 3.56 ha, including clearing for roads, retail and civic areas. The proposed design retains the important connectivity between the vegetation to the south and to the north-east of the site.
- Taking into consideration the likely regional distribution of vegetation types occurring in the proposal area and the relatively small area of disturbance required (3.56 ha), the proposal is expected to have only a local impact to the vegetation types present.
- None of the habitat types identified are listed as Threatened Ecological Communities.
- No Declared Rare Flora were recorded on site. One Priority 2 species, Chordifex ornatus, was identified on the site. Note that the Priority status does not have statutory standing. The Priority fauna classifications are used by the DEC to manage and classify their database of species considered potentially to be at risk, but these categories have no legislative status for protection.
- There are no known Environmentally Sensitive Areas present on or adjacent to the site.

Fauna

Approximately 3.56 ha of relatively disturbed fauna habitat will be cleared as part of the current development concept. The majority of the vegetation types on the site do not appear to be restricted in distribution within the Bremer Bay locality, suggesting that the fauna habitats are likewise more widely distributed. However, clearing on the site should be managed to maintain the connectivity between vegetation to the south of Borden Bremer Bay Road and north of Mary Street.

Environment Protection and Biodiversity Conservation Act 1999

Based on a search of the EPBC Act Protected Matters Search Tool, there are several threatened species potentially present on site that may be impacted as a result of development. Of the identified species, 12 species may occur on site. A targeted survey was undertaken in October 2011 that targeted assessment of fauna habitat, including key plant species potentially occurring on the site area.

Heritage

- No sites of European heritage or Aboriginal heritage significance are located on the site.
- As no surveys for Aboriginal Heritage have been conducted, there is a risk that works on the site may uncover a previously unknown heritage site. It is therefore recommended that an Aboriginal heritage survey of the site is conducted prior to construction.

- The former vesting of the site for recreation with the Shire of Jerramungup would in all likelihood have extinguished native title. This could be confirmed with the Department of Regional Development and Lands if required.

Conclusions and Recommendations

Environmental conditions on the site are considered to be generally suitable for development. There are no fatal flaws or major constraints to development. Issues that need to be addressed prior to development are:

- Drainage and urban water management has been addressed through the development of a LWMS found at Attachment 4, and a requirement to prepare an Urban Water Management Plan (UWMP) (or detailed drainage designs prepared) at the subdivision stage.
- Possible contaminated sites investigations prior to decommissioning of the telecommunications compound.
- Possible Aboriginal heritage survey to confirm that heritage sites are not present in the area.

2.0 PROJECT VISION + OBJECTIVES

PROJECT VISION + OBJECTIVES

The Town Centre Structure Plan will assist to identify key components of the long term direction for orderly and proper growth of Bremer Bay. The main objectives of the Structure Plan include:

- Ensuring the Town Centre is the focus for future retail, commercial, community, civic and cultural uses;
- Improve the legibility of the road network and ensure the heart of the town is easily accessed.
- Ensuring the scale and activities within the Town Centre are commensurate with the intended population for Bremer Bay, commercial viability and the town's coastal and rural setting;
- Providing for a range of services and amenities that will attract people to the area and sustain a constant level of community activity, inclusive of active after hours use, spaces for weekend markets and special events;
- Enhancing and develop a distinct Town Centre "main street" character and identity that complements the coastal and natural resources of Bremer Bay;
- Preserving significant areas of natural vegetation whilst balancing the practical requirements to clear land for safety, access and for future built form;
- Preserve remnant vegetation along eastern boundary of site to retain north-south ecological corridor.
- Providing for greater housing choice through medium density residential development to maximise the number of people living within walking distance of the Town Centre or also provide suitable accommodation for residents to 'age in place';
- Maximising the range and mix of employment opportunities that can be provided within the Town Centre; and
- Creating a safe, convenient, prosperous Town Centre that services the existing and future needs of residents, visitors and tourists.

Basically, the town centre structure plan is intended to:

- Create a 'main street' for Bremer Bay and tie the town together around a focal point for locals residents and visitors.
- Provide a retail, office, entertainment and civic focal point for the Bremer Bay community.
- Create a sense of arrival in Bremer Bay and serve to orientate visitors to sites and activities of the region.

3.0 PLANNING FRAMEWORK

3.1 SITE PARTICULARS

Reserve 31611 (Lot 135) has an approximate area of 10.6 hectares and is generally bound by Bremer Bay Road, Garnett Road and John Street. Garnett Road runs along the western boundary of the site and is constructed to the Bremer Bay Primary School. A significant portion of the site contains remnant vegetation, and a portion of the north - west section of the site is cleared of vegetation and is a disused oval.

3.2 STATUTORY FRAMEWORK

3.2.1 Shire of Jerramungup Local Planning Scheme No. 2

Reserve 31611 is zoned SU8 '*Special Use*' under the Shire of Jerramungup Local Planning Scheme No 2 (the Scheme). Specific provisions apply under Schedule 4 of the Scheme. These Special Use zone provisions were updated under Scheme Amendment 5 in 2014 and the 'Special Use' zone is designated as:

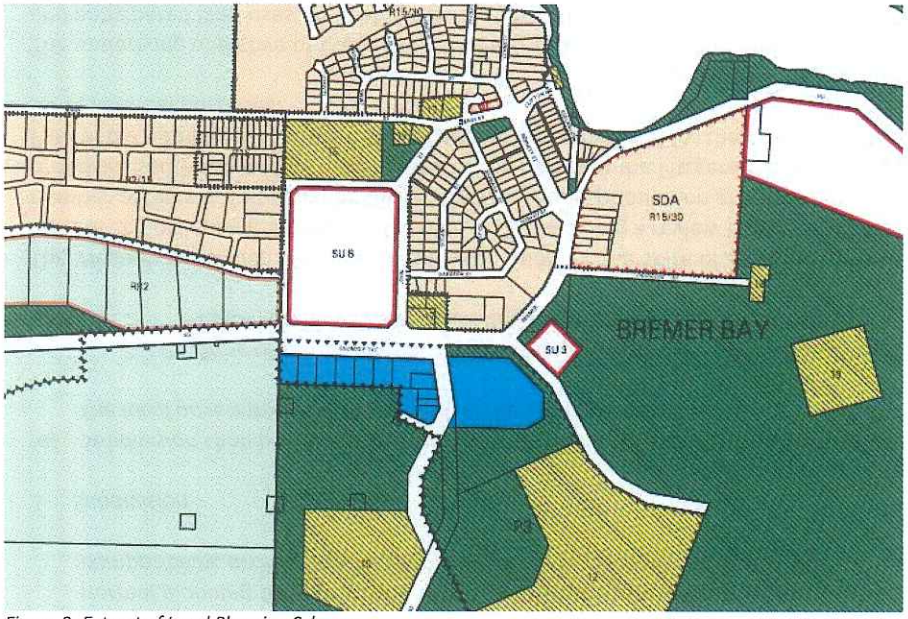


Figure 2: Extract of Local Planning Scheme
Source: Western Australian Planning Commission

"The following landuses will be actively encouraged within Bremer Bay Town Centre;

- *Civic uses*
- *Offices*
- *Community purposes*
- *Shops*
- *Cafe / Restaurants*
- *Grouped Dwellings to comply with density codes as nominated on the Structure Plan*
- *Short stay and tourist accomodation*
- *Aged Accomodation*
- *Tourist related developments."*

The Scheme lists conditions for the 'Special Use' zone stating that:

"1. Structure Plan

(a) A Structure Plan is to be prepared by the proponent and approved by the local government and endorsed by the Commission before any subdivision or development.

(b) The Structure Plan shall address the following matters:
- *An assessment of vegetation and identification of areas of vegetation to be retained in the design to enhance local character of the centre;*
- *Road and Servicing networks;*
- *Identify opportunities for water conservation;*
- *Provide an appropriate interface with surrounding areas;*
- *Landuse Permissibility and provisions for development control.*

2. Development

(a) Development shall be generally in accordance with a Structure Plan approved by the local government and endorsed by the Commission.
(b) Land Use permissibility shall be in accordance with those specifically nominated on the Structure Plan.
(c) All development shall be generally in accordance with any guidelines, site requirements and/ or design criteria adopted by the local government as a Local Planning Policy.
(d) In determining any applications, the local government shall have regard for

normal planning considerations such as streetscape, amenity, landuse compatibility, architectural design, traffic, car parking and landscaping.

3. *Subdivision*

(a) *Subdivision shall be generally in accordance with a Structure Plan approved by the local government and endorsed by the Commission."*

3.2.2 *Shire of Jerramungup Local Planning Strategy June 2006 and Draft Local Planning Strategy Limited Review 2011*

The Western Australian Planning Commission adopted the Shire of Jerramungup's current Local Planning Strategy in October 2012 following a review that identified a number of factors that could be the catalyst for future population growth such as the proposed Southdown Mine near Wellstead, upgrades to the Fitzgerald River National Park and a number of scheme amendments seeking approval for the rezoning of land for residential purposes.

The underlying objective of the Local Planning Strategy (LPS) is to provide for existing and anticipated land uses, to enable new land requirements to be appropriately accommodated as they arise, and to ensure that natural resources are protected and managed for the present and future needs of the community.

The Structure Plan for the Bremer Bay Town Centre is consistent with the following objectives of the LPS:

- *To protect current planning options for the long-term urban development of the region.* The proposed Southdown mine near Wellstead is anticipated to bring population growth to Bremer Bay during the construction and operation phases. Estimates for the mine include up to 2000 workers during the construction phase and a permanent workforce of 650. It is anticipated 20% of the permanent workforce may chose to live in Bremer Bay. The Structure Plan for the Town Centre augments the Strategy objectives to capitalise on the opportunities that this additional population will bring and plan for additional services required to sustain an increase in population.

- *To preserve and protect the existing rural character of the area, and protect areas of high landscape interest.*
- *To provide for more intensive use of land in environmentally and socially suitable areas for uses such as intensive agriculture, rural/residential retreats, and urban expansion.*
The plan highlights the existing remnant vegetation corridor and brings the natural environment into the development as an intrinsic element of the proposed Main Street.

- *To ensure that land use and development are related to the physical capability and suitability of the land to accommodate such development without environmental degradation, and are undertaken in a manner that protects the overall amenity of the subject area.*
The plan has been designed to be responsive to the opportunities and constraints of the subject site.

- *To maintain and enhance the livelihood and lifestyle of residents as far as possible.*
There are a number of small businesses that operate in Bremer Bay, many operate from their place of residence. The Structure Plan offers an opportunity for these businesses to grow and take advantage of better exposure to potential clients and customers.
- *To provide for a variety of lifestyles and residential needs through the provision of a range of lot sizes.*
The private market sufficiently provides for single detached dwellings on larger lots but limited opportunities currently exist for residents to 'age in place'. The Structure Plan allocates an area for future residential opportunities in the form of smaller lots or a retirement village concept. This site could also provide additional opportunities for short-stay accommodation to cater for an increase in tourism activity within the locality.

- *To ensure as far as possible that all residents have access to a wide range of community services and facilities.*
The Structure Plan facilitates the possible expansion of additional retail and commercial and recreational opportunities and improved essential services delivery such as health care.

4.0 THE STRUCTURE PLAN

4.1 PRECINCTS

The Town Centre has been divided into four precincts (Figure 4), reflective of design considerations and future development intent. These precincts are:
(a) Mixed Use
(b) Retail and Commercial Core
(c) Civic
(d) Residential

Development of the town centre is expected to radiate from initial development of the retail and commercial core and the new north-south main street. Initial development will also include the construction of the car park area for the retail and-commercial core and on-street parking for cars, cars towing caravans and tourist buses.

Streets, parks and car parks throughout the town centre should accomodate a range of unique activities that will attract visitors, for example, markets, fairs, festivals, outdoor concerts and alfresco dining.

As required by the Special Use zone conditions the Shire of Jerramungup will prepare design guidelines which will establish key design principles, development requirements including landscaping and parking and control the built form interface at ground level in order to maintain appropriate pedestrian scale, vibrancy, and attractiveness within the town centre. This document will complement the Structure Plan and Landscape Masterplan which has been prepared and indicate at a more detailed level the desired built form outcomes for the site.

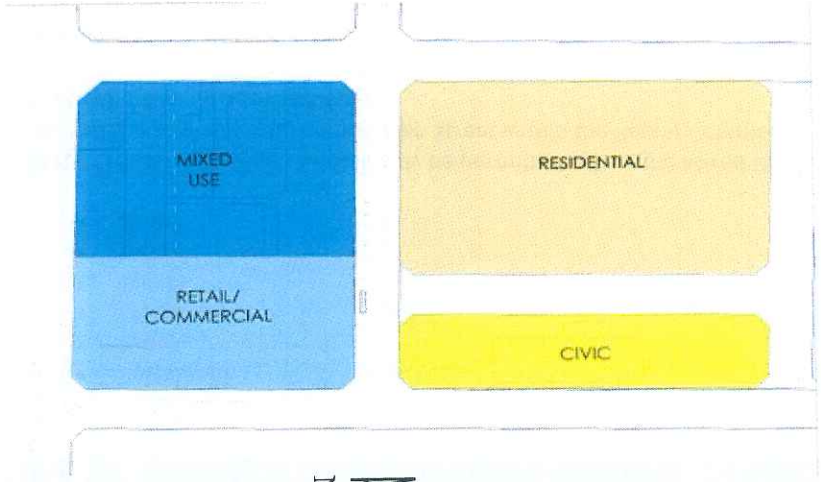


Figure 4: Updated Precinct Plan

4.1.1 MIXED USE

- This precinct accomodates an area for a possible future police station and health campus facility.
- Other possible uses include an eductaional establishment (i.e., reserach facility associated with the Fitzgerald River National Park), as well as community open space.
- A hotel/ tavern or motel could also be located within the Precinct.
- This precinct could also accomodate "overflow" retail and office uses in the future once the Retail/ Commerical Precinct has been developed to capacity, and the town's population growth necessitates additional floorspace.

Objectives:

- To provide for the establishment of a range of compatible commercial, civic, cultural and other government uses.
- To provide a compatible interface/ transition between town centre and residential areas.
- To provide for grouped and multiple dwellings only when combined with a non-residential use
- To provide an area for extension of retail and private office development may be established once the Retail/ Commercial Precinct has been developed to capacity and the population growth of Bremer Bay necessitates additional floor space.

Land uses:

Refer to the Use Class Table at 6.0 for permitted uses.

Preferred uses include:

- Civic Use
- Exhibition Centre
- Educational Establishment
- Hospital
- Medical Centre
- Medical Consulting Room

- Police Station
- Restaurant
- Hotel
- Motel
- Tavern
- Office*
- Shop*

NOTE *: Shop and office uses will only be permitted within the Mixed Use Precinct after all the available land on the Main Street within the Retail/ Commercial Precinct has been taken up and developed.

Development Principles:
These will be stipulated in adopted Design Guidelines and will include:

- Buildings shall have a nil setback to the front boundary, with landscaped areas between buildings.
- Public spaces should be well-designed and purposeful, multi-functional and serve local and visitor needs. Buildings and landscaping should provide an attractive gateway into the town centre.
- Building design, scale, materials and colours should reflect elements of the local environment, the ocean-side setting and "coastal village" character of the town.
- It is expected that the design of any civic building(s) to be constructed within this precinct will exhibit a more formal character and "solid" form, appropriate for a civic/ government-occupied building.
- Buildings will be a maximum of two storeys.
- Parking will generally be provided in perimeter roads and in the centrally located off street parking behind the retail/ commerical precinct. A cash contribution toward parking maybe required from commerical development.
- A residential density coding of R60 will apply to residential development.
- All commercial street frontages shall incorporate a verandah or roof overhang to provide pedestrian shelter over the adjacent footpath.

4.1.2 RETAIL AND COMMERCIAL CORE

Several key commercial drivers were analysed during the design and preparation of the Structure Plan for the town centre. A Retail Demand Analysis Report was prepared by Taktics4 (Attachment 2). Some of these commercial considerations for the retail and commercial areas were balanced against the urban design, environmental and civil considerations which influence the site.

Objectives:
The objectives for the Retail and Commercial Core are:

- To provide for retail shopping, office and commercial development, and social, recreational and community activities servicing the town as a whole in a continuous main street environment.
- To provide for ancillary residential development, either located above or to the rear of commerical development as part of any mixed use developments.

Land uses:
Refer to the Use Class Table at 6.0 for permitted uses.

Preferred uses include:

- Shop
- Restaurant
- Cafe
- Hotel
- Gallery
- Office
- Residential (first floor level and rear of property only)

Development Principles:
These will be stipulated in adopted Design Guidelines and will include:

Arrival and Accessibility

- The retail and commercial core focuses on a main street which delivers customers into the town centre from all directions – not just past the town centre.
- The main street is the logical route to the centre of town with as few turns as possible to access the street.
- The town centre has a logical and clearly designated point of arrival and all infrastructure and design decisions will reaffirm this point i.e. construction of a roundabout and changes to the road pavement materials.

Exposure

- All retail and office and civic activity trades to a single street.

4.0 THE STRUCTURE PLAN

- The non retail activity is just as critical in a small town centre as all pedestrian movement is critical to creating a vibrant environment. The retail and commercial core is within close walking distance to other uses proposed for the town centre creating a critical mass.
- All retail and commercial activity should have a zero setback from the frontage and sides to create a continuous and contiguous streetscape.
- A straight street will ensure that all businesses have the same level of exposure

Configuration

The Structure Plan proposes the core retail and commercial development fronts onto the new north-south main street.

Although a main street is ideally 'double sided' to encourage street life and critical mass of retail and associated activity into a single area, there were three main overriding factors discussed during the design process that led to the retail and commercial area being delineated as single-sided on the plan. These factors include:

- The desire to stretch the retail area from a Borden - Bremer Bay Road frontage to the 26m contour and capitalise on the potential views to the east;
- Bremer Bay is a destination rather than a through town. There is no overriding need to concentrate retail development in a way that encourages people to stay and spend their money in one location. They will attend the town centre regardless as it will end up being the major retail area in the town.
- The ability to locate retail and commercial on both sides of the proposed main street is constrained by the retention of the remnant vegetation for the ecological corridor. From a design perspective the proposed location and configuration of the retail and commercial core is considered the most plausible on the basis that it does not turn its back on the natural landscape and will integrate with the other proposed precincts.

The Structure Plan allocates almost 3000sqm of retail and/or commercial floorspace along the main street. Based on retail analysis prepared during the design and preparation of the Structure Plan, this floorspace will sustainably support a population in the vicinity of 2,000 and up to 2,500. This population figure is consistent with the projections in the Shire's Local Planning Strategy Review.

The Structure Plan also allocates two additional future development sites which could accommodate additional retail and commercial floorspace should population growth and demand necessitate.

Built Form

- Buildings shall have a nil setback to create a continuous and contiguous streetscape.
- The Shire will encourage two storey development along the main street, with either commercial or residential uses at the first floor level.
- Retail/ commercial buildings should have pedestrian access from both the front (to main street) and the rear where a public off-street car park will be provided.
- Residential is not supported on the ground floor at street level, but can be accomodated at the rear of the lot.
- Shop-top housing is supported as a means of assisting people in establishing businesses within the town centre. The costs of establishing a business and also having to also buy accomodation can be prohibitive in a location such as Bremer Bay.
- Residential development shall be developed with a maximum residential density of R60, the requirements of Part 6 of the Residential Design Codes of WA (R-Codes apply). If there is any discrepancy between the R-Codes and a different provision of this Structure Plan or adopted Design Guidelines, the structure Plan and Design Guidelines prevail.
- All commercial street frontages shall incorporate a verandah or roof overhang to provide pedestrian shelter over the adjacent footpath.

Parking & Access

- Significant quantities of on-street kerbside parking have been provided on Main Street. A large parcel of land has also been set aside at the rear of the retail/ commerical premises for future parking. This area will be paved, drained and landscaped by the Shire at an appropriate time in the future when sufficient surrounding development has occured to warrant its construction.
- No vehicle access will be permitted on/off Main Street under any circumstances.
- A cash contribution toward the construction of the rear parking area maybe required from commercial development.

4.1.3 CIVIC PRECINCT

The Civic Precinct is proposed in the central area of the Structure Plan area as it has the closest links to adjacent established residential areas and local school. The benefit of locating the civic uses in this location enables future built form to utilise the 26 m contour to capitalise on the views to and from the site which was expressed as a key design consideration during the preparation of the plan.

The Civic Precinct provides an opportunity for the co-location of community uses such as a new Shire Office, community centre or recreation centre, library/telecentre, and childcare and playgroup facilities. The plan also proposes the civic area incorporates a space that people can enjoy cultural events, social gatherings, celebrations and a place to socialise, exercise and participate in recreation activities.

Objectives:

The objective for the Civic Precinct is:

- To create a community "heart" for the town where people go to take part in the government of their town, to enjoy cultural activities, to socialise, to recreate and be entertained.

Land uses:

Refer to the Use Class Table at 6.0 for permitted uses:

Preferred uses include:

- Civic Uses
- Child Care Premises
- Tourist Information Centre
- Passive recreation and entertainment activities associated with the "Town Square"

Development Principles:

These will be stipulated in adopted Design Guidelines and will include:

- All civic activity will be orientated towards the main street in a similar manner to the nearby retail and commercial uses.
- Any proposed civic buildings will be constructed in a landscaped setting, which also provides a clear interface with surrounding streets.
- Building design, scale, materials and colours should reflect the local environment and the ocean-side setting of the town.
- Buildings may be one or two storeys (max.) in height, have a horizontal emphasis, and take advantages of the views offered by the elevated location.

4.1.4 RESIDENTIAL

According to the 2006 Census approximately 35% of Bremer Bay's resident population are over 50 years old and almost 90% of the total population reside in single detached dwellings.

The current residential lot activity in Bremer Bay sufficiently caters for any additional single detached dwellings for additional families with a number of new residential developments currently underway, however, the market does not provide for the ageing population or provide the necessary services to allow members of the Bremer Bay community to 'age in place'. The town centre offers an opportunity for additional aged accommodation to be provided centrally within Bremer Bay to allow residents of Bremer Bay and the surrounding region to 'age in place' and continue to live within their community rather than relocate to nearby regional centres such as Albany due to lack of suitable accommodation options.

A parcel of land is incorporated into the Structure Plan providing an opportunity for a different residential built form that is presently not being provided by the private market. This could be medium density housing in the form of single or two storey dwellings of 1 or 2 bedrooms on smaller lots (i.e. 300sqm) or a retirement village concept. It is not intended that this land be developed for the standard lot subdivision product. A portion of this land could also be developed for short-stay or tourist accommodation.

Objectives:

- To broaden the range of housing types available within Bremer Bay by providing for medium density grouped and multiple dwellings.
- To provide the opportunity for the development of additional aged accomodation within Bremer Bay.
- To provide the opportunity for the development of short-stay tourist accomodation.

4.0 THE STRUCTURE PLAN

Land Uses:
Refer to the Use Class Table at 6.0 for permitted uses:
Preferred uses include:

- Aged or Dependent Persons' Dwelling
- Multiple Dwelling
- Grouped Dwelling
- Short-term Tourist Accommodation

Development Principles:
These will be stipulated in adopted Design Guidelines and will include:

- Residential density shall be a minimum of R30, and a maximum of R60.
- Development layout, design and form must be consistent with the Residential Design Codes (R-Codes) and the principal aims of Liveable Neighbourhoods.
- In particular, development must be provided in a manner which ensures active street/ land use interfaces, with dwellings fronting all streets to improve personal safety through increased surveillance and activity.
- Fencing on street boundaries is to be kept to an absolute minimum, and consistent in form with the R-Codes. Where not required for privacy purposes, fencing should be "open" in appearance and constructed of appropriate materials.
- A two storey height limit shall apply.

4.2 GENERAL PROVISIONS

4.2.1 Vegetated Ecological Corridor

The long term economic future of Bremer Bay is intrinsically linked to its role as a gateway to the Fitzgerald River National Park and as a base for those attracted to its natural assets. The site contains significant areas of natural bush land which has contributed for a long time to the local landscape character and identity of Bremer Bay. Reserve 31611 is an ecological linkage between two areas of regional conservation significance (Coastal and Fitzgerald River corridors) and the plan proposes the retention of a 120 metre wide strip of native vegetation between the Borden-Bremer Bay Road

Example of Medium Density Housing suitable for population to 'age in place' (Illustrative Purposes Only)

through to the northern section of the subject site be protected and enhanced. The plan highlights the existing ecological corridor and brings the natural environment into the development as an intrinsic element of the proposed Main Street.

It is important for native vegetation to be retained in strategic locations, particularly around the perimeter of the reserve as this will maintain the integrity of existing streetscapes along Garnett Road and John Street as well as provide a buffer to the prevailing winds.

Through careful design of the patterns and forms of development, significant areas to represent the nature of existing local vegetation can be protected and maintained as part of the Town Centre development. Scattered trees or 'clusters' of vegetation can be incorporated into public spaces where feasible whilst being mindful of bushfire safety.

The Department of Environment and Conservation noted in their submission on the previous Structure Plan options prepared in 2010 for the site that Reserve 31611 is a core linkage between the Coastal Corridor that extends from near Albany in the west and the Fitzgerald River Corridor in the east. Although the remnant native vegetation on Reserve 31611 is only 120 m wide, it is the widest remaining linkage west of the Wellstead Estuary.

4.2.2 *Main Street*

A new north-south road is proposed in the Structure Plan to provide connectivity between Borden-Bremer Bay Road and the existing residential development to the north of the Town Centre. The new main street will provide on-street parking for both cars and vehicles towing caravans and trailers. It is also possible for a bus bay to be provided along the new Main Street.

The Main Street is to be boulevard style street with on street parking, water sensitive urban design treatments and wide footpath areas to encourage alfresco uses.

A land swap will be required with the Department of Education to facilitate this new north-south road. The proposed structure plan and design allows the school site to retain an area of 4 hectares and provides for an another road frontage for the school which will provide additional area for parents to drop-off and collect their children.

4.2.3 *Engineering and Movement Networks*

The Structure Plan proposes a large roundabout as an entry statement into the Town Centre to assist in directing traffic onto the Main Street and provides a link and connection to the businesses situated along Gnornbup Terrace.

The roundabout not only serves as an entry statement but will assist in slowing traffic (in addition to changing the road paving materials and colours) to signal to drivers they have entered the Bremer Bay Town Centre.

Footpaths and cycle paths will be provided to make pedestrian movements safe and increase pedestrian permeability. Link paths through the ecological corridor to reduce the walking distance between the Main Street and existing residential areas are also proposed. It is recommended that existing paths through the remnant vegetation be reviewed and rationalised to ensure the ecological value and integrity of the vegetation is retained.

A Connectivity Plan has been provided at attachment 1 demonstrating how the town centre is connected to the surrounding townsite by current and planned walking and cycling networks.

Paths will also be used as visual corridors to draw the eye from the remainder of the townsite to the town/civic spaces.

The development of the site is anticipated to be sewered. The preliminary engineering investigations indicate the site is suitable for sewered development from a geotechnical perspective.

A preliminary engineering investigation has been undertaken by Porter Consulting Engineers with findings indicating that the site is able to connect to existing services located in adjoining streets.

The hydraulic conductivity of the local soils is poor. Infiltration on site is likely to be limited, which may be a constraint for the use of infiltration on site for stormwater management and on site disposal of wastewater. Drainage management on the site will need to consider the implications of low infiltration rates. Some forms of stormwater disposal, such as soakwells, may not be feasible or will require the installation of a sand layer to enhance infiltration. These issues will be addressed in the Local Water Management Strategy (LWMS).

4.2.4 *Fire Management*

The development of the site including the proposed POS reserve should reflect the level of risk from bush fire identified for the area and address the compliance of the proposal with the relevant performance criteria and acceptable solutions, as specified in the Planning for Bush Fire Protection Guidelines. This should also be consistent with the local fire prevention and response plans for the townsite. If required, buildings shall be constructed in accordance with the assigned Bushfire Attack Level under AS3959.

A balance needs to be struck between the retention of native vegetation, particularly in the nature reserve located along John Street, and its relationship with development in the Retail/Commercial precinct. A draft fire management plan has been prepared and approved in accordance with the WAPC's Planning for Bushfire Risk Management Policy Framework to the specifications of the Shire of Jerramungup and the Department of Fire and Emergency Services. This Plan will require further consultation and agreement with the Department of Parks and Wildlife prior to subdivision approval.

4.0 THE STRUCTURE PLAN

4.3 CORE REQUIREMENTS

Overall the Structure Plan provides a broad land use and development framework for the Town Centre and retains a certain level of flexibility so that the Shire of Jerramungup can respond to the needs of the community. However, the following core elements and design principles shown on page 21 will need to be demonstrated as part of any future development proposals:

- The connections between streets, pedestrian and cycle pathways, public and publicly accessible spaces and facilities must be seamless, allowing for universal access and providing a legible built form.
- Retail and Commercial Activity is to be concentrated within the retail and commercial core and promote activation along the new main street
- Public spaces must be attractive and useable to encourage social interaction.

It is noted the lot layouts and building footprint as denoted on the structure plan are indicative only and the final layout will respond to the commercial needs of individual developers and the approvals process of the Shire of Jerramungup.

LEGEND

1 REMNANT VEGETATION
2 CIVIC
3 MEDICAL CENTRE
4 POLICE STATION
5 PARKS AND NATURE RESERVE
6 OFF-STREET PARKING
7 STREET PARKING
7B DOUBLE LENGTH STREET BAYS
8 RETAIL
9 FUTURE DEVELOPMENT OPPORTUNITY SITE
9B FUTURE COMMUNITY AREA
10 FUTURE DEVELOPMENT OPPORTUNITY (POSSIBLE RESIDENTIAL)
11 EXISTING PRIMARY SCHOOL

PARKING

ON-STREET
14 SINGLE LENGTH BAYS
18 DOUBLE LENGTH BAYS
32 TOTAL

OFF-STREET
108 OFF STREET PARKING

(EXCLUDING PARKING FOR VISITOR CENTER, POLICE STATION AND CIVIC)

RETAIL

TOTAL AREA: 2919 SQM

EXPLANATORY NOTES

1. Lands swap required with school to facilitate new Nort-South main street. Alternate connection to north via diagonal road through parks and nature reserve subject to DEC endorsement.
2. Future development oportunity sites allow for expansion should population growth support. Opportunity for 9B to be a community plaza/park space. Opportunity for activities such as weekend markets.
3. Retail Floor plates to be adaptable to allow for flexibility, design should facilitate activation of both frontages and address each corner. Opportunity for shop top housing.
4. New entrance roundabout - possibility of entrance statement feature.
5. Retention of vegetation along eastern boundary of new town centre is an integral component of the masterplan. Creates ecological corridor/green link through Bremer Bay. Opportunity for passive recreation.

NORTH

Note: Building locations and types of land uses are indicative only. Actual locations may change subject to further detailed design and market conditions.

donaldson+warn Cardno

Title: BREMER BAY
SD02 - SITEPLAN
1 : 2000 @ A3
23.03.2012

Job No: 1032

Client Name
BREMER BAY
MASTERPLAN

donaldson+warn
38 Roe Street
Perth WA 6000

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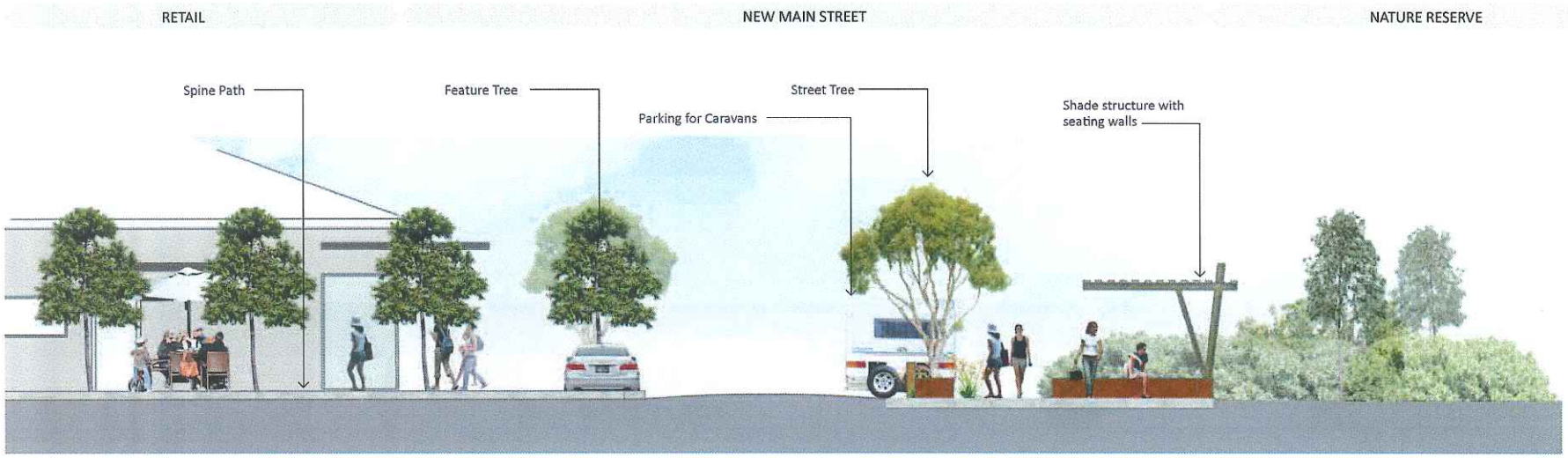

SECTION A NEW MAIN STREET

SECTION B NEW MAIN STREET

LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | TYPICAL SECTIONS

scale: 1:100 @ A3 | date: 11 October 2011 | drawing no: SP113901-03 | issue: A

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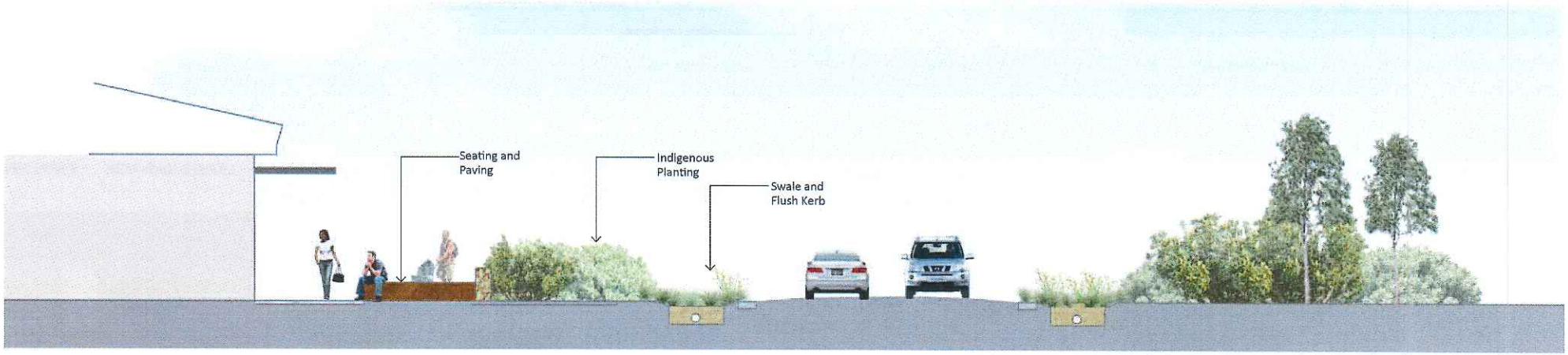
RETAIL / COMMERCIAL

BORDEN - BREMER BAY ROAD

NATURE RESERVE



SECTION C BORDEN - BREMER BAY ROAD

LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | TYPICAL SECTIONS

scale: 1:100 @ A3 | date: 11 October 2011 | drawing no: SP113901-04 | issue: A

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5.0 LANDSCAPE MASTERPLAN

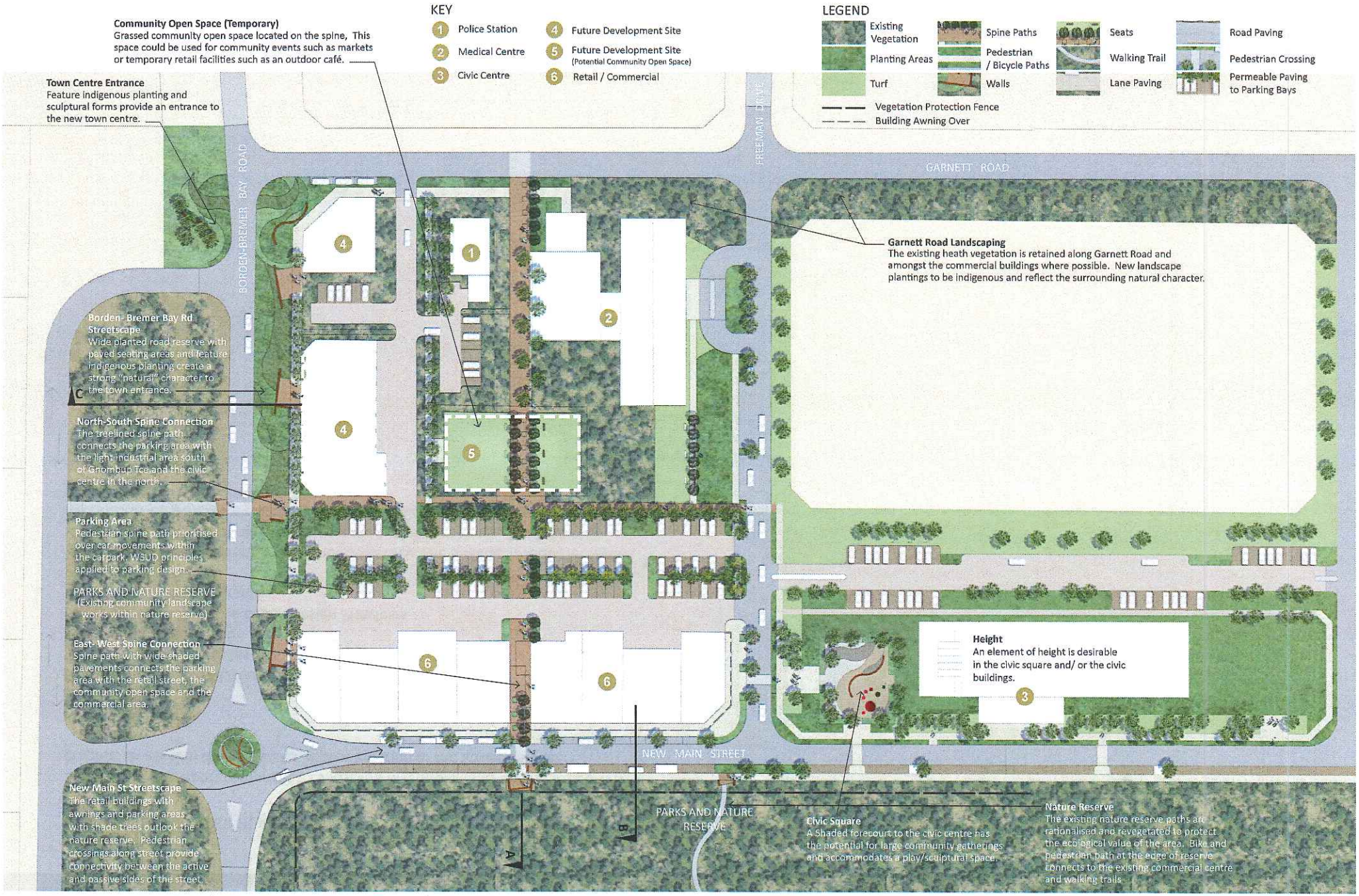
LANDSCAPE MASTER PLAN

Section 5 of the report comprises a Landscape Masterplan and several supporting graphics to assist in the successful implementation of the Structure Plan.

Key Figures include:

Figure 6 - Landscape Masterplan
Figure 7 - Design Principles
Figure 8 - Circulation Plan
Figure 9 - Water Sensitive Urban Design Principles
Figure 10 - Planting Character

NOTE: The Landscape Masterplan is indicative only. The building layouts, lot layout, lot orientation and landscape treatments are subject to change. The following figures provide general overarching design principles to assist in the successful implementation of the Structure Plan.



LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | MASTERPLAN

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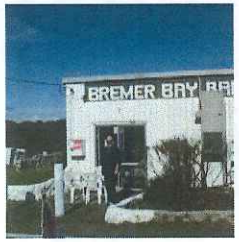
DESIGN PRINCIPLES

RESPECT LOCAL CHARACTER, CLIMATE AND UNIQUENESS

- Preserve low heathland landscape with appropriate new landscape character
- Maintain district views.
- Consider residents comfort through appropriate solar orientation and shelter from rain and the prevailing NW wind.
- Provide opportunities for place making
- Use local materials and building character in the new urban fabric of the town centre



INTEGRATE WITH NATURE

- Retain vegetation (where possible) through careful placement of buildings and paths
- Protect and improve the quality of natural areas through such measures as fencing, reduction in pollutants and revegetation of disturbed pockets
- Highlight the unique ecological values of the natural landscape through interpretive signage
- Use indigenous plantings within streetscape
- Provide large areas of mass planting within the urban environment to create a connection to the adjoining natural landscape
- Integrate the new built form into the natural landscape

DESIGN FOR CONNECTED, SAFE AND ACCESSIBLE PLACES

- Provide compatible interfaces between public and private spaces
- Develop linkages between the existing "commercial" centres and the new town centre
- Integrate and respect the existing permanent communities
- Provide a "total" town way finding strategy through the use of entry markers, directional signage and pavement and landscape types
- Connect to existing pedestrian and bike networks
- Consider walkability distances in design – 400M is the accepted distance a person will walk
- Provide a bicycle and pedestrian network with suitable facilities such as signage, bike racks, seating and drinking fountains
- Consider CPTED principles in design

DESIGN FOR OPEN SPACE DIVERSITY

- Promote community interaction and inclusion in the design of public spaces
- Provide outdoor spaces with multiple functions eg. wide centred pedestrian walkway that could be a Sunday market space or play areas that acts as a sculptural forecourt to the civic building
- Provide outdoor spaces that can cater for a varying population ie large spaces for summer visitors and smaller intimate spaces for local residents in the winter
- Consider future population expansion in open space design

DESIGN FOR SUSTAINABILITY

- Design with appropriate use of building material to maximise energy efficiency
- Promote waste and water minimisation from project conception
- Encourage the use of non motorised transport to reduce reliability on fuel
- Provide recycle bins within streetscape

DESIGN FOR WATER

- Utilise Water Sensitive Urban Design principles in design
- Consider rain water collection and reuse for irrigation and toilet flushing ie water collections from public buildings such as bus shelters and public toilets
- Encourage roof water collection from all buildings
- Provide rain gardens/ large planting areas within the streetscape area
- Recharging aquifers with permeable paving for areas such as carparks, walking trails and cycle paths
- Minimise non permeable areas by minimal road and path pavement widths
- Collect stormwater with a swale flush kerb at the edge of roads at the natural areas
- Investigate one way cross fall roads to avoid traditional collection of STW with pits and pipes
- Investigate the use of bio basins or bio swales for water quality treatment

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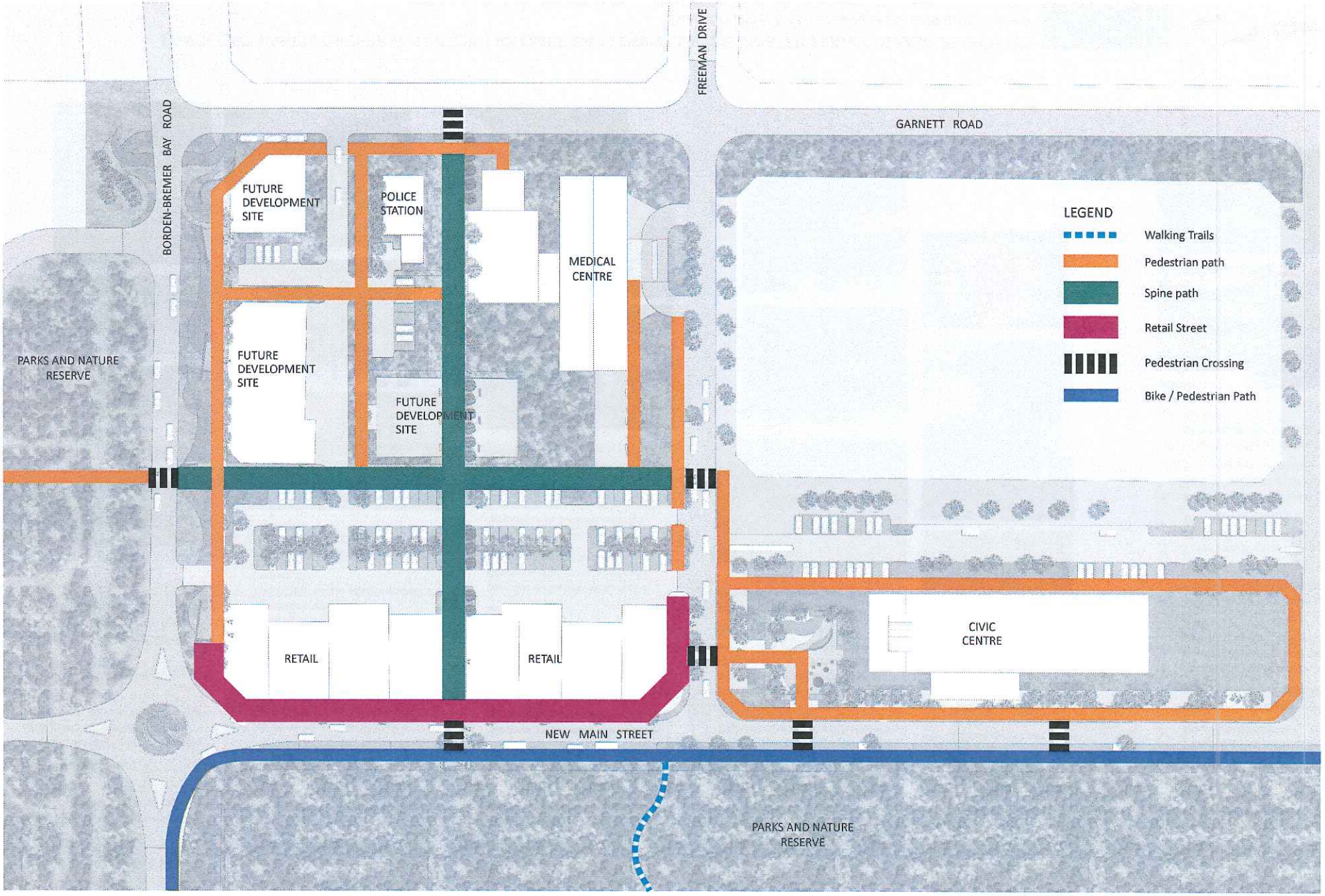

LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | CIRCULATION PLAN

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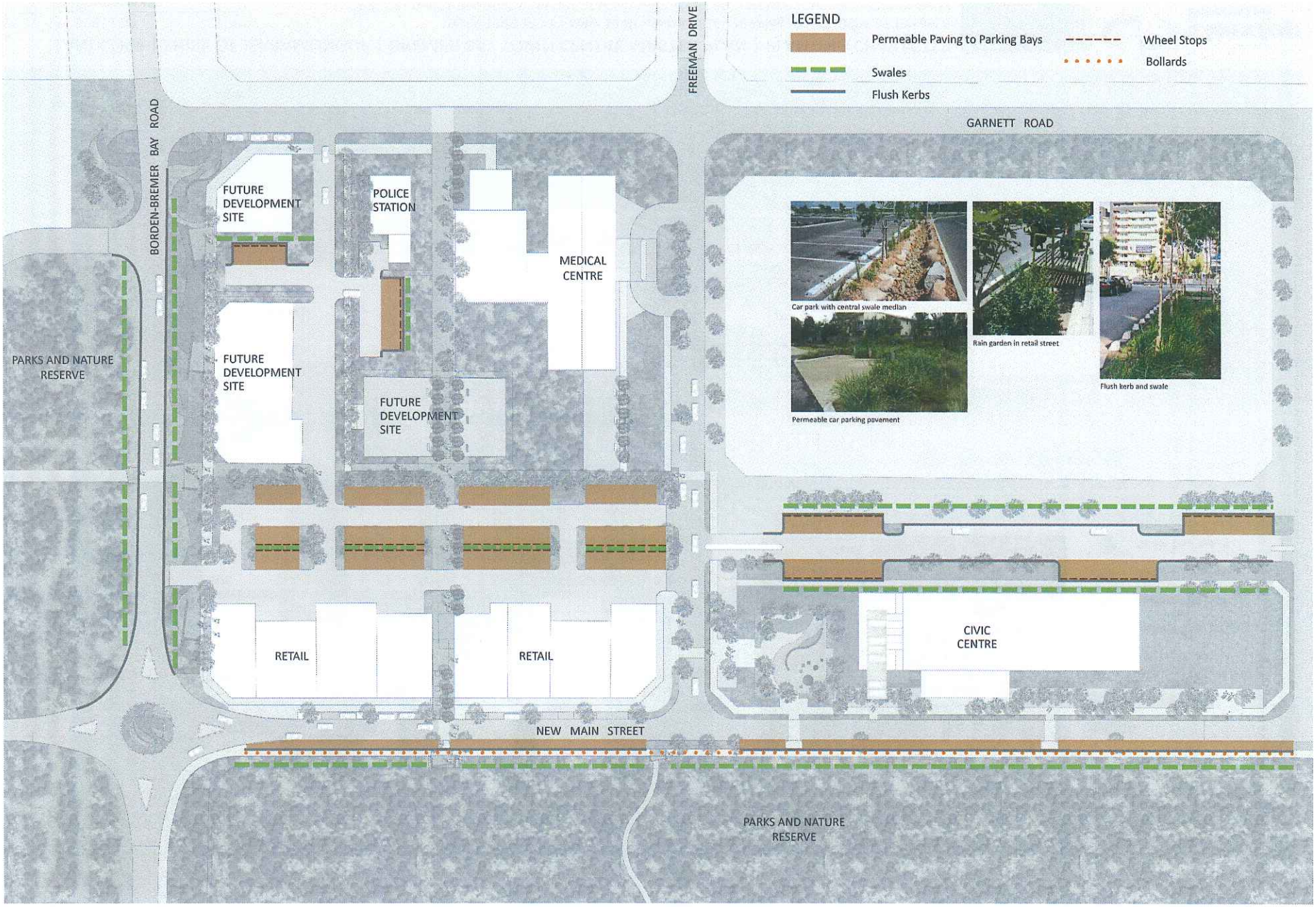

LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | W.S.U.D. PLAN

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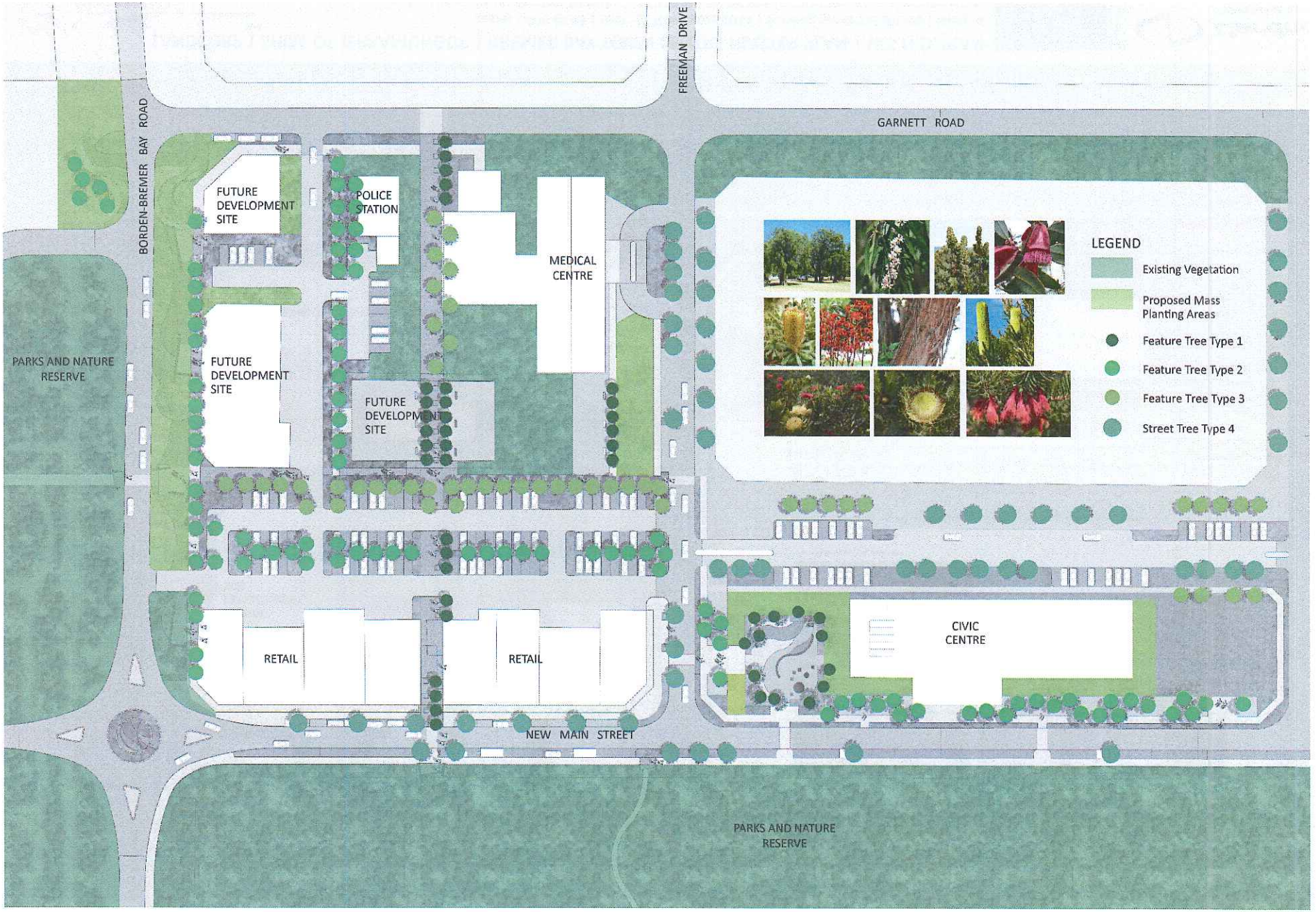

LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | PLANTING CHARACTER

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Scale 1:1000 @ A3

scale: 1:000 @ A3 | date: 13 November 2014 | drawing no: SP113901-07 | issue: B

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6.0 USE CLASS TABLE

BREMER BAY TOWN CENTRE USE CLASS TABLE

The Use Class Table indicates , subject to the provisions of the Scheme, the permissibility of uses within the Town Centre including the appropriate or preferred precinct locations. NOTE: An appropriate use does not guarantee development approval. Prior to any development on the site, a Development Application and appropriate Building License approval must be obtained.

"P" means that the use is permitted providing the use complies with the relevant development standards and the requirements of the Scheme (or Design Guidelines as applicable)
"D" means that the use is not permitted unless the local government has exercised its discretion by granting planning approval and it can be demonstrated by the applicant that the development proposal meets the intent of the Structure Plan and Design Guidelines.
"A" means that the use is not permitted unless the local government has exercised its discretion by granting planning approval after giving special notice in accordance with the applicable advertising provisions with the Local Planning Scheme and it can be demonstrated by the applicant that the development proposal meets the intent of the Structure Plan and Design Guidelines.

If a proponent proposes to carry out a land use that is not specifically mentioned (or assigned to an applicable precinct) within the table below and can not reasonably be determined as falling within the type class or genus of the uses listed in the table below, then the use is not permitted within the Town Centre unless, the Shire determines to exercise discretion in accordance with the provisions of the Local Planning Scheme which deal which deal with approval of prohibited or 'X' use classes.

Use Class	Permissibility	Applicable precinct	Definition
Aged or dependant persons dwelling	D	Residential	Dwelling of a person who is aged 55 years or over or is a person with a recognised form of disability requiring special accommodation provisions for independent living or special care.
Civic Use	P	Civic and Mixed Use	"civic use" means premises used by a government department, an instrumentality of the Crown , or the local government, for administrative, recreational or other purposes
Club Premises	D	Civic	" club premises " means premises used by a legally constituted club or association or other body of persons united by a common interest
Child Care Premises	P	Civic	"child care premises" has the same meaning as in the Community Services (Child Care) Regulations 1988
Consulting Rooms	P	Mixed Use	"consulting rooms" means premises used by no more than 2 health consultants for the investigation or treatment of human injuries or ailments and for general outpatient care
Educational Establishment	D	Mixed Use	"educational establishment" means premises used for the purposes of education and includes a school, tertiary institution, business college , academy or other educational centre
Exhibition Centre	D	Mixed Use, Retail and Commercial Core	"exhibition centre" means premises used for the display, or display and sale, of materials of an artistic, cultural or historical nature , and includes a museum or art gallery
Grouped Dwelling	D	Residential	A dwelling that is one of a group of two or more dwellings on the same lot such that no dwelling is placed wholly or partly vertically above one another, except where special conditions of landscape or topography dictate otherwise, and includes a dwelling on a survey strata with common property.
Home Business	D	Residential	"home business" means a business , service or profession carried out in a dwelling or on land around a dwelling by an occupier of the dwelling which - (a) does not employ more than 2 people not members of the occupier's household; (b) will not cause injury to or adversely affect the amenity of the neighbourhood; (c) does not occupy an area greater than 50 square metres; (d) does not involve the retail sale, display, or hire of goods of any nature; (e) in relation to vehicles and parking, does not result in traffic difficulties as a result of the inadequacy of parking or an increase in traffic volumes in the neighbourhood, and does not involve the presence, use or calling of a vehicle more than 3.5 tonnes tare weight; and (f) does not involve the use of an essential service of greater capacity than normally required in the zone

Use Class	Permissibility	Applicable precinct	Definition
Home Occupation	D	Residential	"home occupation" means an occupation carried out in a dwelling or on land around a dwelling by an occupier of the dwelling which - (a) does not employ any person not a member of the occupier's household; (b) will not cause injury to or adversely affect the amenity of the neighbourhood; (c) does not occupy an area greater than 20 square metres; (d) does not display a sign exceeding 0.2 square metres; (e) does not involve the retail sale, display or hire of goods of any nature; (f) in relation to vehicles and parking , does not result in the requirement for a greater number of parking facilities than normally required for a single dwelling or an increase in traffic volume in the neighbourhood, does not involve the presence, use or calling of a vehicle more than 2 tonnes tare weight, and does not include provision for the fuelling , repair or maintenance of motor vehicles; and (g) does not involve the use of an essential service of greater capacity than normally required in the zone
Hotel	A	Residential, Mixed Use and Retail and Commercial Core	" hotel" means premises providing accommodation the subject of a hotel licence under the Liquor Licensing Act 1988, and may include a betting agency on those premises, but does not include a tavern or motel
Hospital	P	Mixed Use	" hospital" means premises in which persons are admitted and lodged for medical treatment or care and includes a maternity hospital
Medical Centre	P	Mixed Use	"medical centre" means premises , other than a hospital , used by one or more health consultants for the investigation or treatment of human injuries or ailments and for general outpatient care (including preventative care, diagnosis, medical and surgical treatment, and counselling)
Motel	A	Residential and Mixed Use	"motel" means premises used to accommodate patrons in a manner similar to a hotel but in which specific provision is made for the accommodation of patrons with motor vehicles and may comprise premises licensed under the Liquor Licensing Act 1988
Multiple Dwelling	D	Residential and Retail and Commercial Core	has the same meaning as in the Residential Design Codes
Office	P	Mixed Use and Retail and Commercial Core	" office" means premises used for administration, clerical, technical, professional or other like business activities
Place of Worship	D	Civic	" place of worship" means premises used for religious activities such as a church, chapel, mosque, synagogue or temple
Recreation - Private	D	Civic	"recreation - private" means premises used for indoor or outdoor leisure , recreation or sport which are not usually open to the public without charge
Restaurant	P	Mixed Use and Retail and Commercial Core	"restaurant" means premises where the predominant use is the sale and consumption of food and drinks on the premises and where seating is provided for patrons, and includes a restaurant licensed under the Liquor Licensing Act 1988
Service Station	A	Mixed Use	"service station" means premises used for- (a) the retail sale of petroleum products, motor vehicle accessories and goods of an incidental/convenience retail nature; and (b) the carrying out of greasing, tyre repairs and minor mechanical repairs to motor vehicles, but does not include premises used for a transport depot, panel beating, spray-painting, major repairs or wrecking

6.0 USE CLASS TABLE

Use Class	Permissibility	Applicable precinct	Definition
Shop	P	Retail and Development Core	"shop" means premises used to sell goods by retail, hire goods, or provide services of a personal nature (including a hairdresser or beauty therapist) but does not include a showroom or fast food outlet
Shop	D	Mixed Use	"shop" means premises used to sell goods by retail, hire goods, or provide services of a personal nature (including a hairdresser or beauty therapist) but does not include a showroom or fast food outlet
Short Term Tourist Accomodation	A	Residential	means accommodation specifically designed for tourists in the form of villas, townhouses or apartments but does not include caravan park, bed and breakfast, chalets but does include hotel or motel.
Shop Top Housing	P	Retail and Development Core	means a unit or apartment located above retail or commercial premises.
Tavern	D	Mixed Use	" tavern " means premises licensed as a tavern under the Liquor Licensing Act 1988 and used to sell liquor for consumption on the premises
Tourist Information Centre	P	Mixed Use, Civic, and Retail and Commercial Core	means a premise that provides tourism information to the visitors on the area's attractions, lodgings, mas and other items relevant to tourism


HIDDEN TREASURE
HEALTH CENTRE & NURSING POST
TELECENTRE INTERNET ACCESS
PUBLIC TOILETS
ST. JOHNS AMBULANCE
BREMER BAY FIRE BRIGADE
LOCAL STATE EMERGENCY SERVICE
GENERAL & LIQUOR STORE

7.0 STAGING AND IMPLEMENTATION

7.1 STAGING

Reserve 31611 is a significant size and it is not anticipated that the entire area will be required for short to medium term development. Figure 11 provides an indicative staging plan for the Bremer Bay Town Centre. The development and staging particularly of the retail and commercial core of Town Centre will be largely driven by market demand and the final lot layout will respond to the commercial needs of individual developers and the approvals process of the Shire of Jerramungup.

Stage 1

It is the Shire of Jerramungup's intention to commence the detailed design and construction of the following items:

- Streetscape upgrades to Borden-Bremer Bay Road;
- Construction of the roundabout along Borden-Bremer Bay Road to facilitate connectivity between the proposed retail along the new main street and the businesses located along Gnornbup Terrace;
- Upgrade and connect services to the first lot in Stage 1 development area. Exact location and size is yet to be determined;
- Construct and landscape the new north-south main street up to the area identified for civic uses. Main street works could also include the construction of the on-street parking for cars, caravans and tourist bus/es;
- With the assistance of LandCorp subdivide the town centre initially into two land parcels and offer one lot for sale as a commercial site. Dimensions and area are yet to be determined.

Stage 2 onwards

The implementation and development of Stage 2 and onwards will be driven by the market demand and the Shire securing additional funding.

7.2 SUBDIVISION

At the time of subdivision the following are required:

- An Urban Water Management Plan or detailed drainage designs prepared and approved, in consultation with the Department of Water, consistent with any approved Local Water Management Strategy.
- The area identified on the structure plans as 'Parks and Nature Reserve' being vested in the Crown and ceded free of cost.
- An easement in gross over the rear of commercial lots for car parking and access.
- Prior to subdivision, conceptual subdivision plans for all precincts to be prepared. Plans are to include; parking design including modification of access to Bremer Bay Road as a single entry point; staging within the residential area; density (R30 and R60) and lot sizes; internal road layout within precincts.
- A Construction Management plan, prepared in consultation with DPAW, will be required as a condition of subdivision and this will address; areas to be identified and protected from disturbance during the civil works, translocation of any Priority Flora occurrences and handling of disturbed fauna, mitigation of dieback disease during construction and implementation of such plan.
- Preparation and implementation of a fire management plan prepared in consultation with Department of Parks and Wildlife.

7.3 DEVELOPMENT

Design Guidelines are to be prepared for each precinct prior to development approval within the site. The guidelines are to include, but not limited to shop top housing design, height restrictions, plot ratio, setbacks, car parking, landscaping and screening of storage areas

7.4 IMPLEMENTATION

The success of the town centre will be reliant on thoughtful design, integrating the built form and public domain. Design guidelines will be prepared by the Shire to ensure the future built form is responsive to the public domain and is flexible to adapt and respond to increases in population growth and the seasonal tourist activity.

The final location and form of buildings may differ from those indicated on the Structure Plan. The Design Guidelines will be developed to guide future built form. The Structure Plan does not attempt to predetermine detailed design decisions but provides some general principles. Some key design considerations include:

- Buildings should be of high quality contemporary design, appropriate for the intended use and materials should reflect the uniqueness and character of Bremer Bay. The design must make a positive visual contribution to its environment i.e. limit blank facades.
- The design of the buildings in the retail and commercial core should allow for the possibility of some adaptation and flexibility since the needs of future users can

never be fully anticipated. Building design should ensure that the internal layout, position of entrances, stairs and methods of construction allows some flexibility in its use to extend its durability and long term value. Flexible floor plates will allow tenancies to expand or decrease floorspace according to market forces and facilitate temporary or interim tenancies or 'pop-up' stores (e.g. art shows or exhibitions) which could occupy a space for a period of time and reduce vacant tenancies.

- Buildings should be designed to provide pedestrian protection from the weather and create a comfortable external environment for pedestrians.

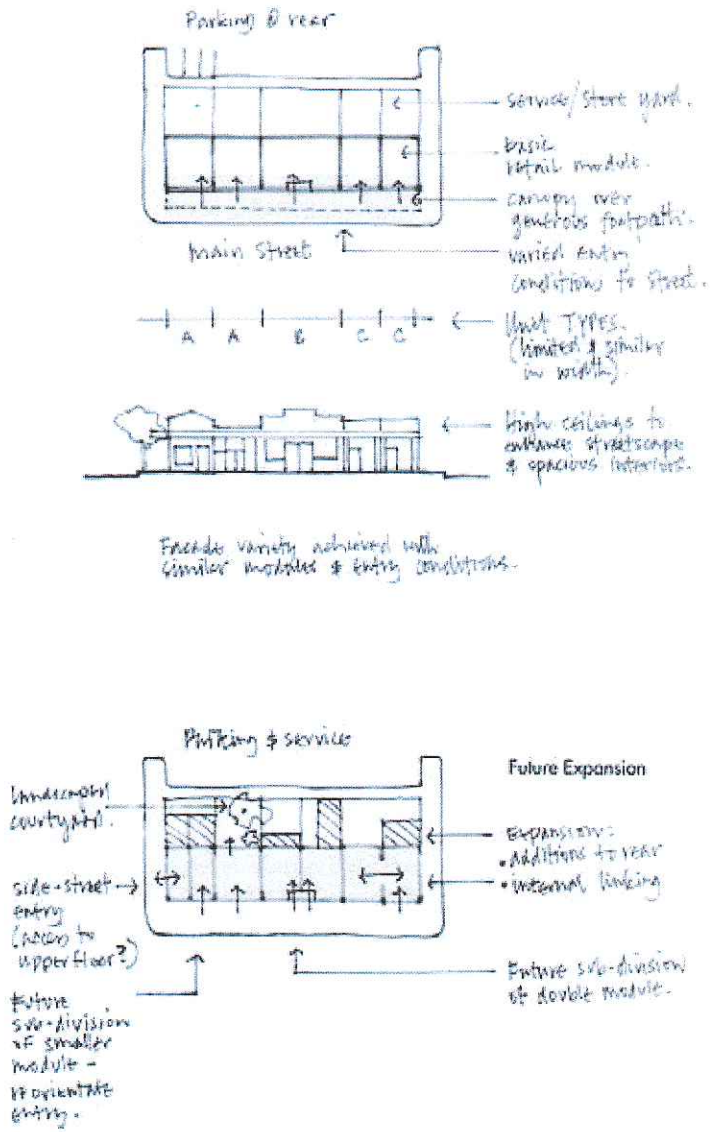
7.5 FURTHER STUDIES

There are a number of further studies required to support the coordinated development of the Town Centre and assist in ensuring its success over time. These include:

a) A commercial strategy is to be prepared to assist with consolidation of the existing commercial businesses with new town centre. The strategy is to include incentives which are aimed to encourage the relocation of existing businesses.

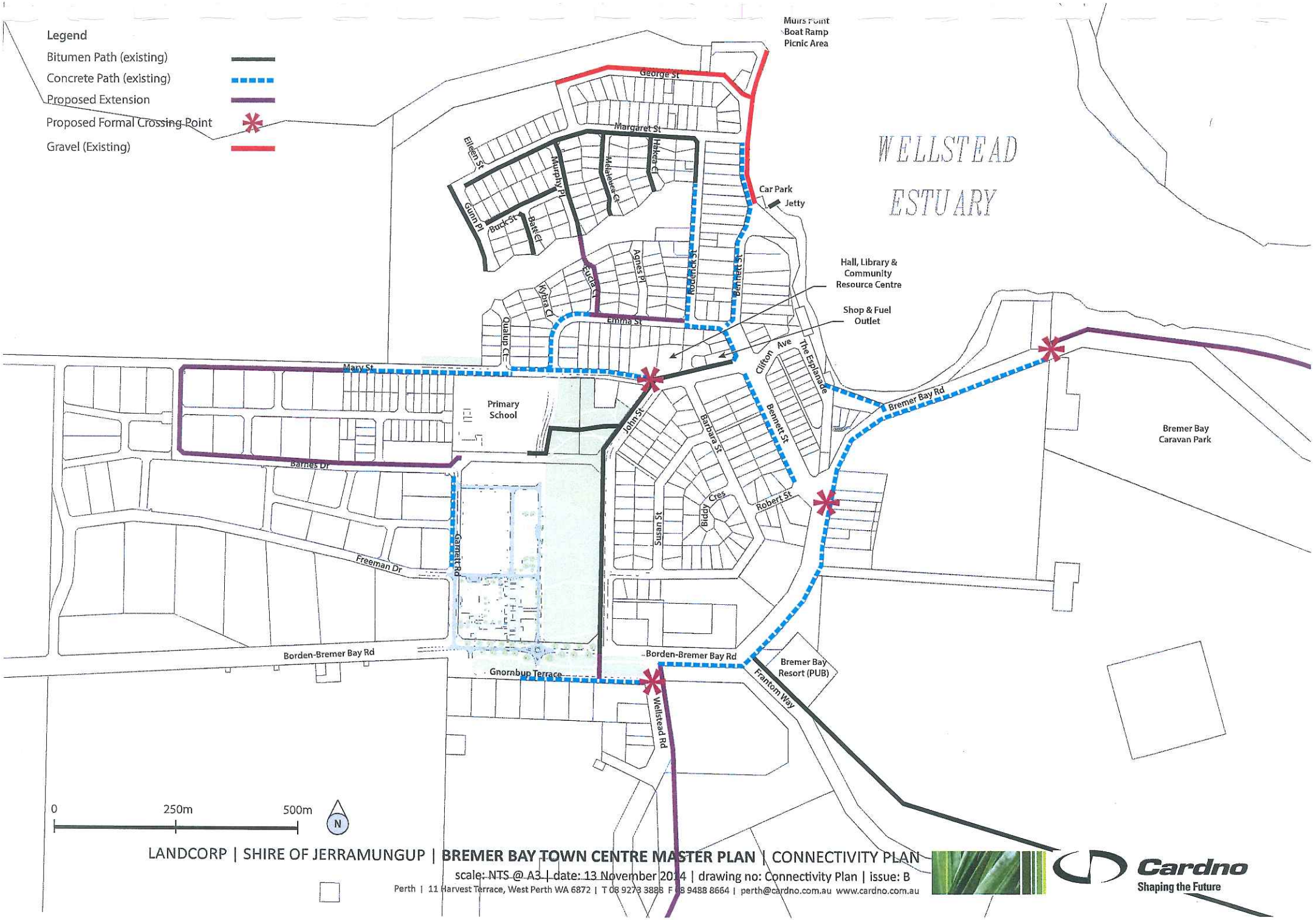
b) An environmental protection/reserve management plan for flora, fauna and vegetation is to be prepared. The plan is to address use, management and preservation of the ecological corridor, including interpretive information, areas for public use and paths network consolidation. Plan will be prepared in consultation with the Department of Parks and Wildlife.

Figure 11: Retail and Commercial Design Principles



Perspective Sketch (Illustrative Only - actual building styles to be determined during preparation of Design Guidelines) : Looking north towards new main street from Borden-Bremer Bay Road.

ATTACHMENT 1 - CONNECTIVITY PLAN



LANDCORP | SHIRE OF JERRAMUNGUP | **BREMER BAY TOWN CENTRE MASTER PLAN** | CONNECTIVITY PLAN

scale: NTS @ A3 | date: 13 November 2014 | drawing no: Connectivity Plan | issue: B

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Shaping the Future

ATTACHMENT 2

RETAIL DEMAND ANALYSIS

Taktics4
Bremer Bay

Retail Demand Strategy

Land Corp
Shire of Jerramungup
Cardno
May 2011

Contact

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Version Control

Document Name	Date	Description	Prepared
Bremer Bay - Retail Demand Strategy - 02	May 2011	First draft	GD

Distribution Control

Document Name	Date	Distribution	Format	Delivery
Bremer Bay - Retail Demand Strategy - 02	May 2011	EdJ - Cardno	PDF	email

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CONTENTS

1 INTRODUCTION

Key decisions that reflect the desired positioning and vision for planned commercial activity should be predicated on a thorough understanding of the market drivers that will influence the likely performance of its tenants. Analysis of consumer markets and economic drivers will ensure that development and initiatives involving the commercial activity will be able to operate in a sustainable manner.

1.1 Purpose

- Assess the retail potential in Bremer Bay under a range of potential growth scenarios
- Assess the commercial influences and economic implications of creating a town centre in Bremer Bay

1.2 Approach/Scope

- analyse the resident market demand based on consumer shopping behaviour
- analyse the visitor market demand based on consumer shopping behaviour
- analyse the tenant demand based on major tenant store networks
- analyse the site characteristics against a range of commercial considerations

1.3 Principles/hypothesis

- The ability to create a prosperous town centre in a regional township requires more than simply designating areas on a map.
- Attracting businesses to a region and then to a designated town centre location and configuration will be determined by the ability for that business to satisfy a target market in a productive manner.
- The location of the town centre and its configuration will shape the future of Bremer Bay forever. It is critical to create an environment that allows for the immediate economic potential of the township as well as its future potential
- A population growth scenario has been utilised beyond that currently expected or planned for in order to ensure that the needs of the town and its community may be accommodated well into the future
- Retailing is the initial driver of consumer behaviour. If we can achieve a vibrant retail base the community, civic and commercial office space will gravitate intuitively to the retail activity
- The attraction of an anchor tenant such as a supermarket chain – encourages the attraction of smaller tenants – safe in the knowledge that more local dollars will be retained in the town.

1.4 Approach/ Methods

The findings in this report are based on analysis of the following datasets:

- Population and Household census (ABS 2006)
- Dwelling approvals by LGA (ABS 2006-2011)
- Household Expenditure Surveys (ABS 2003-04)
- CPI indexes (ABS 2003-11)

- Population forecasts (WA Tomorrow 2009) & (Shire of Jerramungup 2011)
- Traffic Counts (Dept MR 2010-11)
- Major Store Locator web sites (2011)
- Industry productivity surveys (2010)
- Tourism WA regional surveys (2009)

2 MARKET DEMAND

The demand for retail activity will depend on the amount of space that may be sustained by consumer spending.

2.1 Resident Catchment

- The resident catchment is determined by the extent of travel residents are prepared to travel to access retail goods and services
- The behaviour will vary according to retail category – shorter distances for food and grocery goods and further distances for goods such as fashion and household appliances
- The proximity of major retailers generally determine consumer behaviour because they have the greatest range of products
- In this case the current and future distribution patterns of supermarket and delicatessen chains will have the greatest influence over the future consumer behaviour in Bremer Bay.

2.2 Regional Environment

- The Bremer Bay community has access to three main retail centres
- Albany is the closest centre to Bremer Bay that has the largest range of retail goods and services outside of Perth.
- Albany is comparable in offer to Busselton and Bunbury and if residents were to travel past Albany they are likely to access retail activity in Perth
- Esperance has a smaller range of retail goods and services including food and grocery products. It is unlikely that Bremer Bay residents would choose Esperance over Albany for retail goods.

2.3 Existing Retail Activity

- A local deli/general store operates in Bremer Bay with a gross building area of about 1,200sqm
- The NLA store size is estimated to be closer to 600sqm
- More retailers will become attracted to Bremer Bay as the population increases

2.4 Major Supermarkets Chains

- The closest major supermarket chains are located 150km from Bremer Bay in Albany, (Coles and Woolworths), and Katanning (Woolworths)
- These major stores are typically up to 3,000sqm each and can capture between $20M p.a. - $35M p.a. depending on the size of the catchment
- The catchment for the larger chains appears to be 50km radius – but they are based in the larger population centres

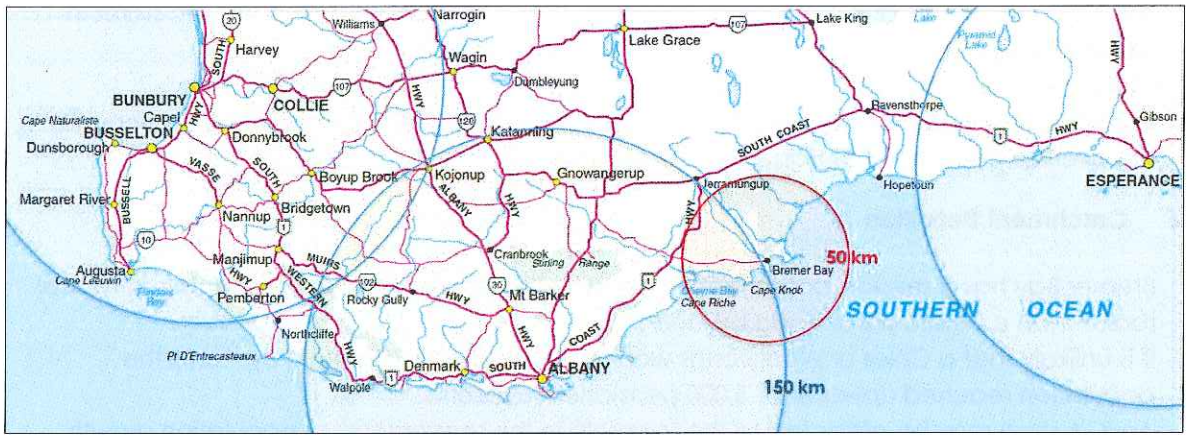
2.5 IGA Supermarkets Chain

- The IGA store is typically 3-5 times smaller (500sqm-1,000sqm) than Coles and Woolworths with a corresponding smaller range of products
- They are capable of capturing $$5M p.a. - $10M p.a. depending o the size of the catchment

- The IGA chain network is more comprehensive than Coles and Woolworths with stores in Jerramungup, Gnowangerup and Ravensthorpe
- The distribution pattern highlights an efficient 50km radius for the network
- A fifty kilometre radius for Bremer Bay overlaps significantly with Jerramungup – although this overlap also occurs at Hopetoun/Ravensthorpe

2.6 Catchment Definition

- Bremer Bay has a seaside catchment – meaning that there are fewer residents in a typical radius than a centre surrounded by land
- It is unlikely that a Coles or Woolworths would be attracted to Bremer Bay – until the population reached upwards of 5,000 permanent residents.
- An IGA store may be attracted to the township in the shorter term as population growth occurs
- An IGA is usually able to develop with its catchment and can subsequently be developed earlier
- The attraction of an IGA to the town will retain greater spending in the town by reducing the need to travel to Jerramungup and Albany for food and grocery goods.
- Businesses locating in Bremer Bay will primarily cater to a resident and visitor population within a 50km radius of the township
- Residents and visitors located beyond this radius will primarily access goods and services in other centres
- Even the introduction of an IGA would see the catchment remain at 50km.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Dunsborough
Katanning
Ravensthorpe
Gibson
SOUTH COAST
Boyup Brook
Kojonup
Gnowangerup
Jerramungup
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ESPERANCE
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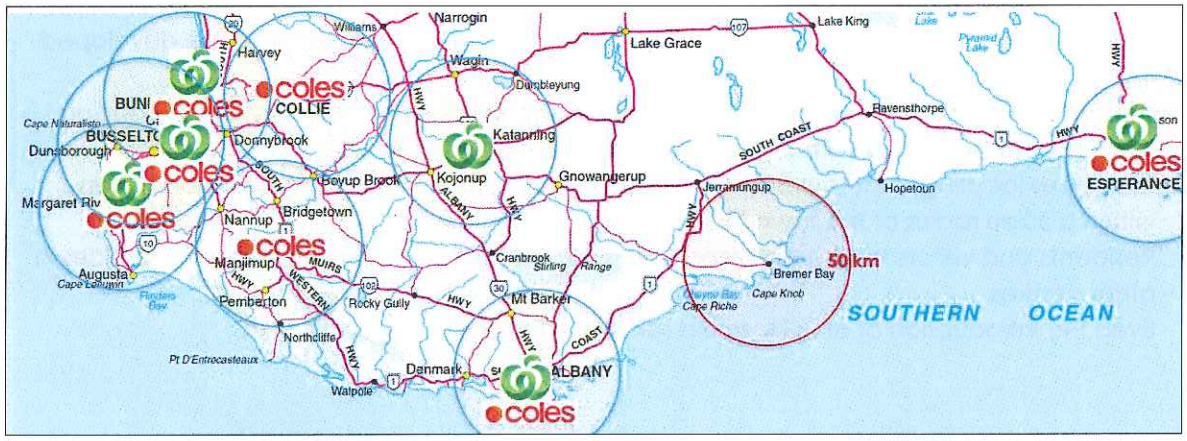
Denmark
ALBANY
Walpole
150 km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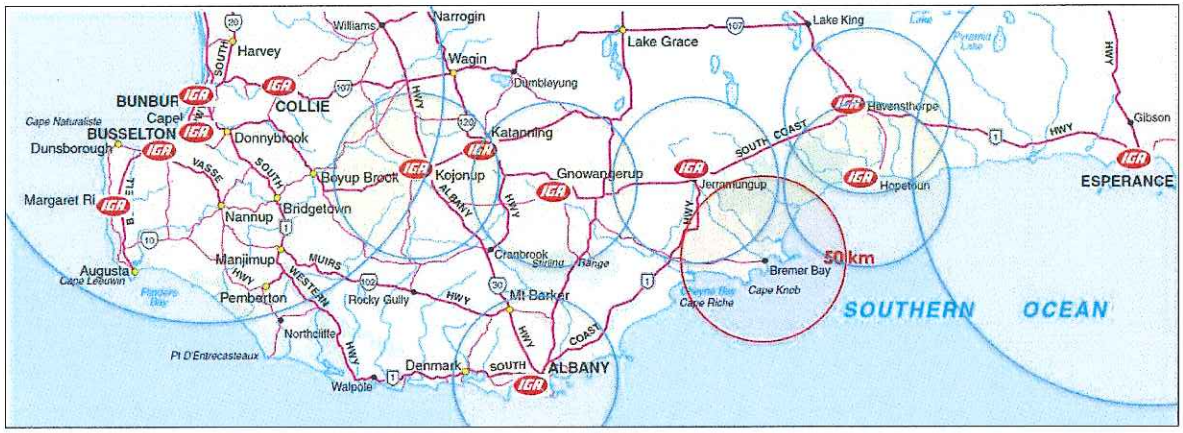
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OCEAN
Northcliffe
Pt D'Entrecasteaux
Denmark
ALBANY
Walpole

3 MARKET PROFILES

3.1 Residents

- Nearly 700 people were counted within a 50km radius of Bremer Bay on census night 2006
- With 500 (72%) located in Bremer Bay township (half in Bremer Bay and half in Point Henry)
- The remaining 200 (28%) people resided outside the township
- Nearly 90% (600) of the people counted in Bremer Bay on census night were usual residents while 10% (100) listed another address as their usual residence
- There are 435 private dwellings in Bremer Bay
- Only half (215) of the private dwellings are occupied by permanent residents producing an average of 2.2 usual resident /occupied private dwelling

3.2 Dwelling approvals

- Nearly 60 dwellings were developed in the Shire of Jerramungup since 2006 at an average of 12 dwellings per annum or one per month.
- The majority (up to 90%) of these dwellings (50) are estimated to be developed in Bremer Bay
- Assuming that more than 75% of new dwellings (37) are occupied by permanent residents
- An average of 2.2 persons per dwelling would be responsible for an additional 80 residents in Bremer Bay.
- Bremer Bay is therefore estimated to have a permanent resident population of 680 and a regular visitor rate of 120 at any given period during the off season.

3.3 Visitors

- Visitors in the southern region have an average length of stay of 3 nights
- A typical off peak visitor profile therefore suggests 45,000 visitor nights per annum.(120 visitors per night by 365 days)
- Traffic counts at Bremer Bay highlight the shift in visitors during the peak Christmas holiday season.
- The counts show that volumes remain consistent with off season before the 21st December and return to normal after 1st February
- During peak periods the volumes of traffic increase on average by nearly 4 times normal counts
- Visitors increase to an average of 450 visitors (peaking at 800 visitors during the Christmas week)
- The six week Christmas period produces 22,000 visitor nights bringing total number of visitor nights in Bremer Bay to 60,000.
- By comparison the 680 permanent residents generate 250,000 resident nights representing 80% of the 310,000 total people nights

3.4 Summary

- The planning growth scenarios used in forecasts range from a doubling of the population (1,500 residents) to a seven fold increase (5,000 residents)

- This paper does not consider the merits of the planned scenarios or discuss the prospect or mechanisms of achieving them
- It simply identifies the potential retail demand associated with each of the population scenarios

Census District (CD)	Location	Persons Counted on census night	Distribution
5132206	Bremer Bay Township	243	35%
5132205	Bremer Bay Surrounds (including Point Henry)	254	37%
5132203	North	97	14%
5132204	North	97	14%
Total	All	691	100%

Data Source: 2006 Census of Population and Housing

Usual Address	Persons	%
At home	605	88%
Elsewhere in Australia (visitors)	84	12%
Overseas visitor 2006	0	0%
Total	689	100%

Data Source: 2006 Census of Population and Housing

Dwelling Approvals	Shire of Jerramungup
2006-07	9
2007-08	9
2008-09	14
2009-10	21
2010-Jan11	5
Jun 07-Jan 11	58

Dwelling Approvals (ABS 2006-11)

	average vehicles per day	rate above normal traffic volumes	Estimated visitors	Estimated visitor nights
Jun-10	300		120	
21-Dec	750	2.5	300	2,100
28-Dec	2,000	6.7	800	5,600
4-Jan	1,500	5.0	600	4,200
11-Jan	1,250	4.2	500	3,500
18-Jan	1,250	4.2	500	3,500
25-Jan	750	2.5	300	2,100
1-Feb	450	1.5	180	1,260
average	1,136	3.8	454	22,260

Traffic counts (DMR 2010-11)

4 RETAIL POTENTIAL

4.1 Spending

- Permanent Residents in the shire of Jerramungup are estimated to be spending 8% less than WA average on retail goods.
- this may be attributed to a combination of factors including
    - reduced need
    - unavailability of goods/offer
    - smaller household sizes
- permanent residents have the potential to generate $7.6M p.a. of which only $5.2M p.a. is captured by food and grocery spending
- Visitors spend an average of $15 per visitor day on retail related goods and services
- Visitors have the potential to spend $900,000 p.a. on retail related goods and services – predominantly in Bremer Bay
- A total of $6M p.a.in food and grocery retail spending is current available for capture in Bremer Bay

4.2 Growth

- A doubling of the population (without substantial increase in visitors) would see the sales potential in Bremer Bay increase to $17.5M p.a. ($13M p.a. in food and grocery)
- Increasing the population Bremer Bay to 5,000 residents would result in a sales potential to $55M p.a. ($37M p.a. in food and grocery spending)

4.3 Sustainability Activity

- Based on industry productivity levels (amount of annual retail sales per sqm of floor space to produce a profitable return for a business), the current sales potential is capable of sustaining less than 900sqm of retail floor space
- This space equates to 6 shops including a 500sqm supermarket and general merchandise store
- A doubling of the population base in Bremer Bay would be capable of sustaining nearly 2,000 sqm of retail floor space including a 1,000sqm supermarket/general merchandise and 12 shops
- A population of 5,000 would be capable of sustaining 10,000sqm of retail floor space
- Nearly half of this space would be contained by three stores including 2,000sqm supermarket, 1,500sqm general merchandise store and a 1,000sqm hardware store (although any combination of these stores may be developed)
- The remaining space could be incorporated in up to 40 specialty shops

	2011	scenario 1	scenario 2	scenario 3
resident population	700	1,500	2,500	5,000
resident nights	250,000	550,000	900,000	1,800,000
visitor nights	60,000	70,000	80,000	90,000
Total retail sales ($ p.a.)	$6,000,000	$13,000,000	$18,500,000	$37,000,000
sustainable floor space (sqm)	900	2,000	5,000	10,000
supermarket (sqm)	500	1,000	1,500	2,500
smaller shops (no.)	6	12	20	40
street frontage (metres)	70	120	190	350
length of double sided street (metres)	35	60	80	175

5 LAYOUT & CONFIGURATION

- The configuration and layout of the retail floor space is crucial to the sustainability of the specialty businesses and to the overall vibrancy and vitality of the town centre.
- The following key commercial drivers should be considered when designing and setting out a town centre.
- Some of these commercial considerations may need to be balanced against the urban design, environmental and civil considerations which will influence the site.

5.1 Arrival & Accessibility

- Promote a main street which delivers customers into the town centre from all directions – not just past the town centre
- Ideally the street should be the logical route to the centre of town with as few turns as possible to access the street
- On a continue thoroughfare or logical end destination – dead end or token streets do not encourage movement through the street
- A town centre should have a logical and clearly designated point of arrival and all infrastructure and design decisions should reaffirm this point

5.2 Exposure

- There can only be one clearly defined retail street in a small regional township
- All retail and office and civic activity should trade to the a single street
- Activity established around the corner of a street will dilute pedestrian and traffic volumes and reduce the vitality vibrancy and sustainability of the town centre by duplicating competing interests/precincts
- The non retail activity is just as critical in a small town centre as all pedestrian movement is critical to creating a vibrant environment
- All activity should have a zero setback from the frontage and sides to create a continuous and contiguous streetscape
- A straight street will ensure that all businesses have the same level of exposure
- Car parking at the rear of shops should only have one direct and central access point to the street
- Creation of a main street between cross streets is preferable to at cross roads as the role of the cross street may become blurred

5.3 Configuration

- The street should encourage double sided street frontage – retail activity should be the predominant street front with office based above the shops and civic in an adjacent precinct on the same street front
- The population growth scenarios indicate that the size of the main street may range from 35 metres in the immediate term to an ultimate length of 175 metres

ATTACHMENT 3

PRELIMINARY ENVIRONMENTAL SITE INVESTIGATION REPORT

STRATEGEN
environmental consultants

Preliminary Environmental Site Investigation Report

Bremer Bay

DRAFT

Prepared for
LandCorp
by Strategen

March 2012

Preliminary Environmental Site Investigation Report

Bremer Bay

DRAFT

Strategen is a trading name of
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Level 2, 322 Hay Street Subiaco WA
ACN: 056 190 419

March 2012

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Client: LandCorp

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Preliminary Draft Report	A	Client Review	C Rea, B Downe/ J Mitchell	Electronic	16/5/11
Draft Report	B	Client Review	C Rea, B Downe M Dunlop / J Mitchell	Electronic	7/3/11
Final Draft Report					
Final Report					

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

This report has been prepared to support future potential rezoning and development of Part Lot 135 (22 John Street) Bremer Bay and the area currently designated as road reserve between Bremer Bay Road and Gnombup Terrace to the south of Part Lot 135 (the site). This development is being progressed to achieve the following objectives:

- develop Part Lot 135 in line with the needs of the Bremer Bay community
- ensure that the development meets and exceeds the LandCorp standards for sustainable development
- ensure the development meets and exceeds the environmental standards set by State regulators and the Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC).

This report identifies environmental characteristics associated with the proposed development, based on a desktop environmental assessment, site visit, and a site survey describes:

- environmental characteristics, including:
  - soils (including waste water disposal and potential for acid sulphate soils)
  - hydrology and drainage (i.e. groundwater characteristics, Priority Areas and surface water drainage requirements)
  - any environmentally significant areas, including wetlands/waterways and their likely buffer requirements
  - potential for occurrence of significance species or ecological communities
  - potential or suspected site contamination (including assessment of prior landuse within the sites and adjacent to the site)
  - buffer requirements to adjacent industry or other significant land uses
  - location of any listed Aboriginal sites or known heritage values
- review of development implications
- possible management responses to development.

2. SITE CHARACTERISTICS

2.1 SITE LOCATION

The potential development site is located within the Bremer Bay townsite (Figure 1), and it comprises 14.7 ha in total, of which a portion will be developed (Figure 2).

2.2 CURRENT LAND USE

The site is currently unoccupied and contains cleared areas (a former school oval), a telecommunications facility and native vegetation (Figure 2).

The site is zoned 'Special Use' under the Shire of Jerramungup Local Planning Scheme No. 2 (LPS2) (Department of Planning [DoP] 2010). Under this zoning, the site is permitted to be used for the following purposes:

- civic uses
- offices
- dwellings under the medium density codes of the Residential Design Codes
- community purposes
- shops
- movement systems
- landscaping areas
- civic places
- parking areas.

Prior to development, "a Structure Plan is to be prepared by the proponent and approved by the local government and endorsed by the Commission, the Structure Plan is to incorporate:

- a strategy to retain areas of native vegetation in the design to enhance local character of the centre and conserve water
- permissible land uses
- road and servicing networks
- development staging
- such other matters as determine by local government" (DoP 2010).

2.3 SURROUNDING LAND USES

Immediately south of the site, land is zoned 'Service Commercial' under LPS2.

To the east, land is zoned 'Residential' and 'Public Purposes – Civic and Cultural' under LPS2. The 'Public Purposes' lot to the southeast of the site contains a site of European heritage significance (Section 4.6.1).

To the west, land is zoned 'Residential' and 'Rural Residential' under LPS2.

A gazetted road reserve (the continuation of Garnett Street) forms the northern boundary of the site. Land to the north of the road reserve is zoned 'Public Purposes – School', 'Public Purposes – Civic and Cultural' and 'Recreation and Open Space' under LPS2.

The town water supply is located approximately one kilometre east of the site, at the termination of Progress Drive.

The wastewater treatment plant is located 500 m southeast of the site. The buffer provided in the existing LPS2 extends to a distance of 200 m from the wastewater treatment plant (Gray & Lewis 2009).

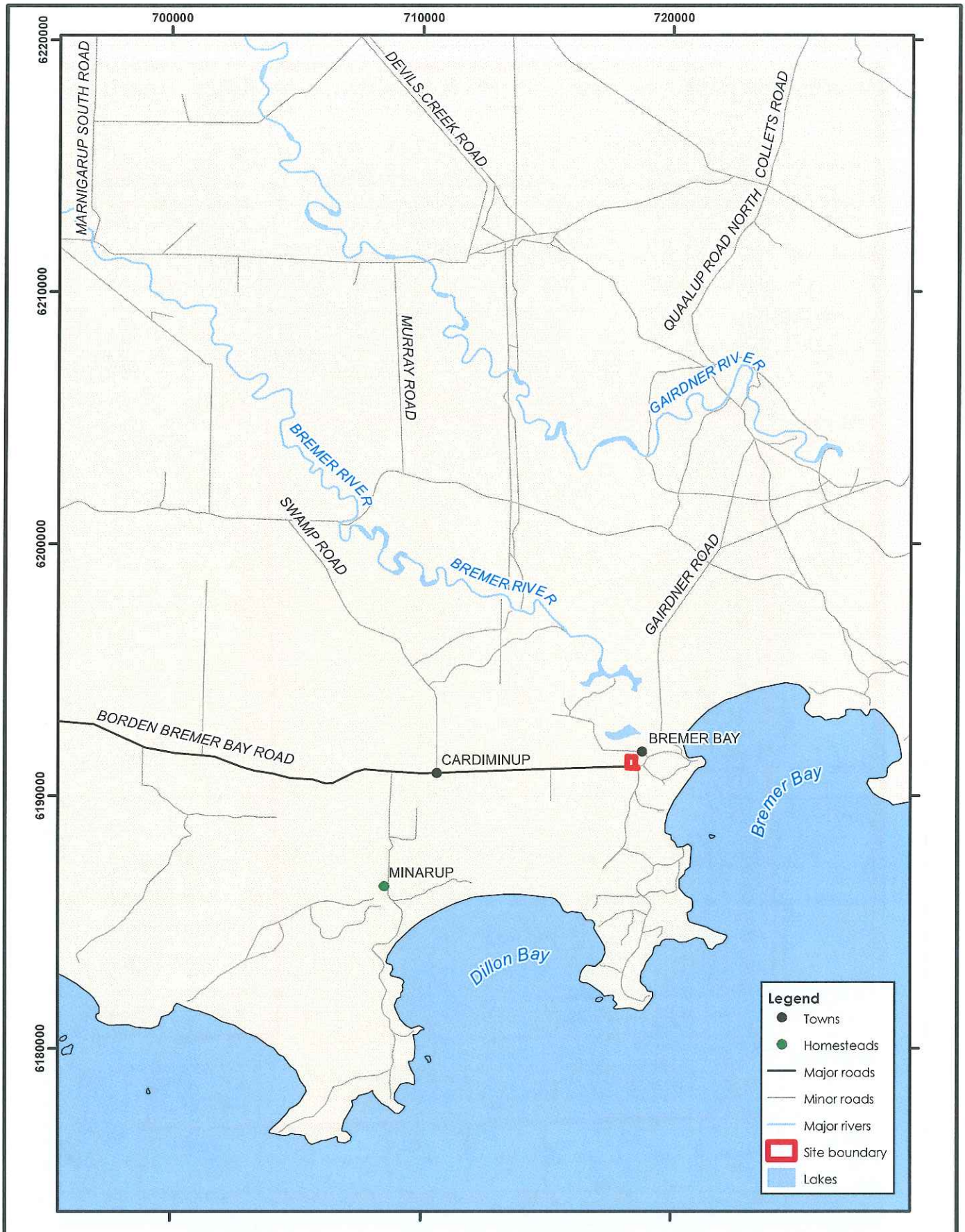

Figure 1 Location

Regional

Source: ESRI 2006

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Scale
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Kilometres

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1:200,000
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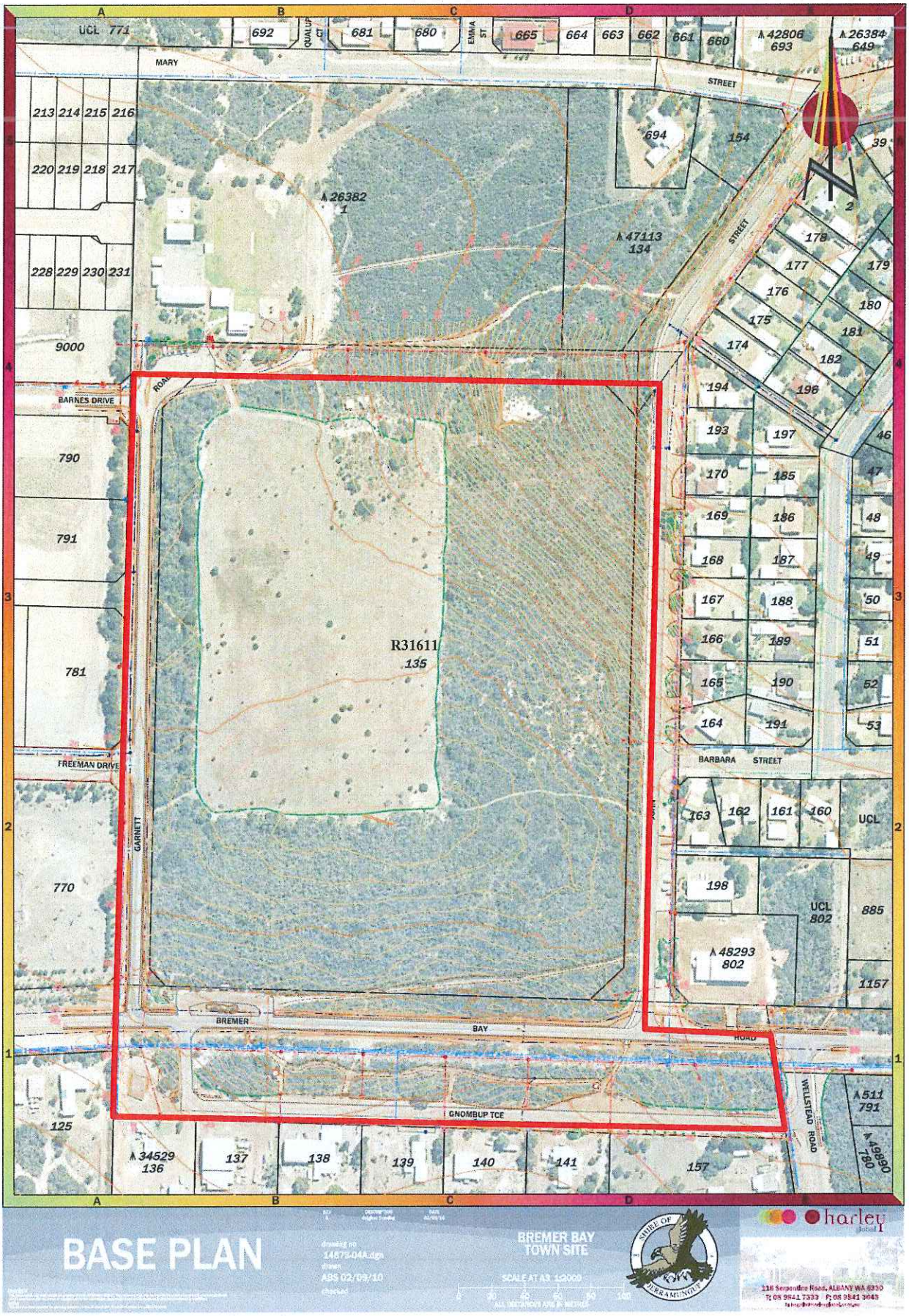
Coordinate System: GDA 1994 MGA Zone 50
Date: 8/02/2012
Author: JCrute

Source: Geoscience Australia 2006
Note that positional errors may occur in some areas

Path: Q:\GIS\Consult\2010\LAN\LAN10184\ArcMap_Documents\Bremer_Bay_Town_Centre_PESI\LAN10184_01_Bremer Bay Town Centre PESI_RevB_F001.mxd



STRATEGEN	Site plan	FIGURE 2

3. RELEVANT POLICY AND LEGISLATION

The following section describes the policy and legislation that relate to the environmental factors relevant to the site.

3.1 GEOLOGY AND SOILS

The Acid Sulphate Soils (ASS) Guidelines (West Australian Planning Commission [WAPC] and Department of Planning and Infrastructure [DPI] 2008a) state that an ASS investigation is required for rezoning when the site is depicted as partially or wholly within an area of 'high to moderate risk of ASS occurring within 3 m of natural soil surface'.

Additional requirements exist at the subdivision stage for sites where any dewatering or drainage works (either temporary or permanent), or the excavation of 100 cubic metres or more of soil is proposed where:

- land is partially or wholly within an area of 'high to moderate risk of ASS occurring within 3 m of natural soil surface
- site characteristics or local knowledge lead the applicant to form the view that there is a high to moderate risk of disturbing acid sulfate soils at this location (WAPC & DPI 2008a).

The objective of the *Contaminated Sites Act 2003* (WA) (CS Act) is to protect human health, the environment and environmental values by providing for the identification, recording, management and remediation of contaminated sites.

The *Environmental Protection Act 1986* (WA) (EP Act) and CS Act require proponents to control the extent and discharge of dewatering and to ensure that soil, groundwater and surface water are of an acceptable standard compatible with the intended land use, and consistent with appropriate criteria, as well as minimising the risk to human and ecological health. This involves the identification, recording, management and remediation of contaminated sites and acid sulfate soils (ASS).

3.2 HYDROLOGY

Planning Bulletin 92: Urban water management (WAPC 2008) and *Better Urban Water Management* (WAPC & DPI 2008b) outline the criteria under which Water Management Strategies are required to support land development. *Better Urban Water Management* (WAPC & DPI 2008b) also outlines the requirements for the contents of these documents.

Planning Bulletin 92 states that a Local Water Management Strategy (LWMS) is required to support the Local Structure Plan (LSP) as part of the development application process (WAPC 2008). The LWMS should be based on 18 months' monitoring of surface water and groundwater, including two winter peaks (generally October in the South West) (WAPC 2008). The Bulletin also advises that an Urban Water Management Plan (UWMP) is required to support any subsequent subdivision applications.

Public Drinking Water Source Areas (PDWSA) are protected through *Statement of Planning Policy No 2.7: Public Drinking Water Source Policy* (WAPC 2003) and *Land Use Compatibility in Public Drinking Water Source Areas* (DoE 2004). PDWSA areas are rated from Priority 1 to Priority 3 depending on the acceptable levels of risk to water resources. These documents outline acceptable land uses for each Priority level.

3.3 VEGETATION AND FLORA

3.3.1 Environmental Protection Authority objectives

The Environmental Protection Authority (EPA) applies the following objective in its assessment of proposals that may affect vegetation and flora:

To maintain the abundance, species diversity, geographic distribution and productivity of flora and fauna at species and ecosystems levels through the avoidance or management of adverse impacts and improvements in knowledge.

EPA Position Statement No. 2

EPA Position Statement No. 2 (EPA 2000) provides an overview of the EPA position on the clearing of native vegetation in Western Australia. Principles and related objectives and actions have been adopted from national strategies in the development of this Position Statement. In assessing a proposal, the EPA will take into account the following principles when considering impacts on vegetation:

- comparison of proposal scenarios, or options, to evaluate protection of biodiversity at the species and ecosystems levels, and demonstration that all reasonable steps have been taken to avoid disturbing native vegetation
- no known species of plant or animal is caused to become extinct as a consequence of the proposal and the risks to threatened species are considered to be acceptable
- no association or community of indigenous plants or animals ceases to exist as a result of the proposal
- there is a comprehensive, adequate and secure representation of scarce or endangered habitats within and/or in areas biologically comparable to the site area protected in secure reserves
- if the proposal is large (in the order of 10–100 ha or more, depending on where in the State) the site area itself should include a comprehensive and adequate network of conservation areas and linking corridors whose integrity and biodiversity are secure and protected
- the onsite and offsite impacts of the proposal are identified and the proponent demonstrates that these impacts can be managed.

EPA Position Statement No. 3

EPA Position Statement No. 3 (EPA 2002) discusses the principles the EPA would apply when assessing proposals that may have an effect on biodiversity values in Western Australia. The aims of this Position Statement are to:

- promote and encourage all proponents and their consultants to focus their attention on the significance of biodiversity and, therefore the need to develop and implement best practice in terrestrial biological surveys
- enable greater certainty for proponents in the environmental impact assessment process by defining the principles the EPA will use when assessing proposals that may have an effect on biodiversity values.

EPA Guidance Statement No. 33

EPA Guidance Statement No. 33 (EPA 2008) provides guidance on assessing vegetation where it is considered significant for a range of reasons including:

- scarcity
- unusual species
- novel combination of species
- a role as a refuge
- a role as a key habitat for threatened species, or large populations representing a significant proportion of the local or regional total population of a species
- being representative of the range of a unit
- a restricted distribution.

Threatened Ecological Communities (TECs), as listed by DEC and under the EPBC Act, are of high significance.

In addition, DEC maintains a list of Priority Ecological Communities (PECs) which identifies those communities that need further investigation before possible nomination for TEC status. PECs are considered to be of a Regional to State-level of significance.

EPA Guidance Statement No. 51

EPA Guidance Statement No. 51 (EPA 2004a) provides guidance on standards and protocols for terrestrial flora and vegetation surveys, particularly those undertaken for the environmental impact assessment of proposals.

3.3.2 Legislation, policy and guidance

State protection

In a legislative context, the preservation and conservation of flora and ecological communities is covered primarily by the following Western Australian legislation:

- *Wildlife Conservation Act 1950 (WA)* (WC Act)
- *Environmental Protection Act 1986 (WA)* (EP Act)
- *Conservation and Land Management Act 1984 (WA)* (CALM Act).

The WC Act protects all native flora in Western Australia. Flora considered to be rare are gazetted as Declared Rare Flora (DRF) under section 23F of the WC Act. Under the WC Act it is illegal to remove or damage DRF without approval. DRF are specifically scheduled for protection under the WC Act and are species that have been adequately searched for, and are deemed to be either rare, in danger of extinction, or otherwise in need of special protection.

Priority species are those listed by DEC as potentially threatened but for which there is insufficient evidence to properly evaluate their conservation significance. They range from Priority one to Priority four species, and are as follows:

- Priority One: Poorly Known Taxa, taxa known from one or a few (generally <5) populations, which are under threat
- Priority Two: Poorly Known Taxa, taxa known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat
- Priority Three: Poorly Known Taxa, taxa known from several populations, at least some of which are not believed to be under immediate threat
- Priority Four: Rare Taxa, taxa considered to have been adequately surveyed and which whilst being rare, are not currently threatened by any identifiable factors.

Note that of the above classifications, only DRF has statutory standing. The Priority flora classifications are employed by the DEC to manage and classify its database of species considered potentially to be at risk, but these categories have no legislative status for protection in addition to the native vegetation clearing legislation.

The Environmental Protection (Clearing of Native Vegetation) Regulations 2004 set forth the concept of Environmentally Sensitive Areas (ESAs) that are precluded from clearing because of environmental values including wetlands, TECs and Declared Rare Flora.

Australian Government protection

In a legislative context, the preservation and conservation of flora and ecological communities is covered by the *Environment Protection and Biodiversity Conservation Act 1999* (Australian Government) (EPBC Act).

The EPBC Act regulates the protection and management of Matters of National Environmental Significance (MNES), which are defined under Schedule 1 of the EPBC Act as:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- listed threatened species and ecological communities
- migratory species protected under international agreements
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mines).

3.3.3 Fire Management

The *Planning for Bushfire Prevention Guidelines* (PBFPG) (WAPC & FESA 2010) outline the requirements for fire management planning at each stage of the planning process. Because of the location of the site adjacent to bushland on the south and west the bushfire hazard must be addressed at the structure plan stage through:

- inclusion of a bushfire hazard assessment based on the PBFPG
- identification any bushfire hazard issues arising from that assessment
- development of fire protection requirements to address those issues, in accordance with the general principles that underpin these guidelines, in the form of a Fire Management Plan (FMP) (WAPC & FESA 2010).

3.4 FAUNA

3.4.1 EPA objectives

The EPA applies the following objectives in assessing proposals that may affect fauna:

To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge

To maintain biological diversity that represents the different plants, animals and microorganisms, the genes they contain and the ecosystems they form, at the levels of genetic diversity, species diversity and ecosystem diversity.

3.4.2 EPA Position Statements, Guidance Statements and Guidelines

EPA Position Statement No. 3

EPA Position Statement No. 3 (EPA 2002) discusses the principles the EPA would apply when assessing proposals that may have an effect on biodiversity values in Western Australia. The aims of this Position Statement are to:

- promote and encourage all proponents and their consultants to focus their attention on the significance of biodiversity and, therefore, the need to develop and implement best practice in terrestrial biological surveys
- enable greater certainty for proponents in the environmental impact assessment process by defining the principles the EPA will use when assessing proposals that may have an effect on biodiversity values.

EPA Guidance Statement No. 56

EPA Guidance Statement No. 56 (EPA 2004b) provides guidance on standards and protocols for terrestrial fauna surveys, particularly those undertaken for the environmental impact assessment of proposals.

EPA Guidance Statement No. 20

EPA Guidance Statement No. 20 (EPA 2009) provides guidance on standards and protocols for surveys for Short Range Endemics (SRE) fauna, particularly those undertaken for the environmental impact assessment of proposals.

3.4.3 Regulatory Framework

State protection

The preservation and conservation of fauna is covered by the following Western Australian legislation:

- *Wildlife Conservation Act 1950 (WA)*
- *Conservation and Land Management Act 1984.*

In Western Australia, rare or endangered species are protected by the Wildlife Conservation (Specially Protected Fauna) Notice 2010(2), under the WC Act. Schedules 1 and 4 in this notice are relevant to this assessment, providing a listing of the species protected by this Notice.

Fauna are also listed by DEC as Priority species if they are potentially threatened but for which there is insufficient evidence to properly evaluate their conservation significance. They range from Priority 1 to Priority 5 species, and are as follows:

- Priority 1: Poorly Known Taxa, taxa known from one or a few (generally <5) populations, which are under threat
- Priority 2: Poorly Known Taxa, taxa known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat
- Priority 3: Poorly Known Taxa, taxa known from several populations, at least some of which are not believed to be under immediate threat
- Priority 4: Rare Taxa, taxa considered to have been adequately surveyed and which whilst being rare, are not currently threatened by any identifiable factors
- Priority 5: Taxa that are conservation dependent. If conversation programs were ceased, the taxa would become threatened within five years.

Note that the Priority status does not have statutory standing. The Priority fauna classifications are employed by the DEC to manage and classify their database of species considered potentially to be at risk, but these categories have no legislative status for protection.

Australian Government protection

The Federal EPBC Act protects species listed under Schedule 1 of the Act. In 1974, Australia became a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). As a result, an official list of endangered species was prepared and is regularly updated. This listing is administrated through the EPBC Act. The current list differs from the various State lists; however, some species are common to both.

Australia is party to the Japan-Australia (JAMBA), China-Australia (CAMBA) and Republic of Korea-Australia (ROKAMBA) Migratory Bird Agreements. Most of the birds listed in these agreements are associated with saline wetlands or coastal shorelines. A number of migratory birds not associated with freshwater wetlands are also listed on these international treaties. In addition, migratory birds are protected by the EPBC Act.

3.5 HERITAGE AND NATIVE TITLE

Aboriginal heritage is managed under the Aboriginal Heritage Act (1972) (AH Act) and applies to all land. The AH Act makes it illegal to excavate, destroy, damage, conceal or alter a site to remove an object from a site, or deal with an object in a manner not sanctioned by relevant custom, or to assume possession, custody or control of an object, without the written authorisation of the Registrar of Aboriginal Sites or the consent of the Minister or the Aboriginal Cultural Material Committees consent to an archaeological excavation or removal of material. All sites are protected whether they are known to the Department of Indigenous Affairs (DIA) or not.

The Heritage of Western Australia Act 1990 protects places registered under the Act through prevention of inappropriate alteration to such places.

Native title is managed under the federal *Native Title Act 1993 (NTA)* and complying state legislation, such as the *Land Administration Act 1997 (LAA).* Native title is extinguished by some forms of tenure.

4. ENVIRONMENTAL CHARACTERISTICS

4.1 TOPOGRAPHY, GEOLOGY AND SOILS

Topography of the site slopes to the south and northeast of a plateau which lies in the southern half of the site (Figure 2). Elevation of the site varies from 26 mAHD on the plateau to 16 mAHD at the boundary with John Street (Douglas Partners 2011).

Regional geology is described by Thom and Chin (1977) as 'sandplain – yellow to white sand and clay; contains scattered limonite nodules derived from underlying gravel and laterite'. The sand deposits and deeply weathered mantles of laterite overlie Eocene and Tertiary sediments of the Pallinup and Werrilup formations (Ferdowsian 2003).

The dominant soils in the area are grey (deep and shallow) sandy duplex, alkaline grey sandy duplex soils, pale deep sands and duplex sandy gravels (Overheu 2003). Results of a geotechnical survey undertaken on the site by Douglas Partners in 2011 indicate that the soil profile generally comprises:

- Topsoil – grey sandy topsoil at all test locations to depths ranging between 0.05 m and 0.15 m
- Sand – loose to medium density, yellow, fine to medium grained sand encountered underlying topsoil. Thickness ranged from 0.05 m and 0.4 m
- Sandy gravel – dense to very dense, yellow to yellow-brown, fine to medium sized, sandy gravel with some low plasticity fines encountered from depths ranging between 0.15 m and 0.5 m
- Clayey sand – very stiff to hard, yellow-brown to yellow-brown mottled white and red, medium plasticity, clayey sand with varying amounts of cobbles to depths between 1 m and 2.2 m
- Sandstone – medium strength, highly to moderately weathered, yellow-brown to mottled red, sandstone encountered from depths between 1.0 m and 1.3 m (Douglas Partners 2011).

4.1.1 Acid sulphate soils

The Landgate WA Atlas does not include any Acid Sulphate Soils (ASS) mapping available for the Bremer Bay area. Mapping conducted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (2006) indicates that there is a low likelihood of ASS at a broad scale in the Bremer Bay area. This is consistent with the lack of permanently damp or wet areas on the site and the lack of evidence of peat and other hydric soils (Douglas Partners 2011).

4.1.2 Contamination

A search of the Contaminated Sites Database (DEC 2012) indicated that there were no contaminated sites in the Bremer Bay townsite. Sensitive land uses adjacent to the site include the residential areas to the east, school to the north and the land zoned 'residential' and 'rural residential' to the west.

Historical assessment of landuse

Aerial photos illustrate how land use has changed in the study area since 1957 (Appendix 1). A review of historical land use from available aerial photography of the Bremer Bay area is provided in Table 1.

Table 1 Historic aerial photograph review

Year	Property	Comment:
1957	Part lot 135 and road reserve to the south	Undeveloped. Route of Bremer Bay Road runs through western portion of site.
1969		Portion of John Street site developed for the purposes of recreation. Two areas of disturbance are located within a vegetated strip that runs along the southern edge of the site.
1976		
1982		As above. Gnombup Terrace constructed.
1996		
2004		

Current site conditions

Strategen conducted a site inspection on 5 April 2011 to assess the potential for site contamination as a result of historic land uses. This assessment does not constitute a Preliminary Site Investigation (PSI) as outlined in *Reporting on Site Assessments* (DEP 2001). To prepare a compliant PSI, additional investigation would be required including discussions with site representatives and review of available literature and licensing information, search for historical licenses and review by an accredited Contaminated Sites Auditor.

The key findings of the site visit are summarised as follows:

Site inspection

Uses of the site observed during the site visit were:

1. A cleared historical recreational area of approximately 3 ha now disused (Plate 1 to Plate 4).
2. Telecommunications equipment including a mast, satellite dishes and a weatherboard shed are contained within a 6 m^2 fenced compound (Plate 5). The compound is due to be removed in 2013 (Craig Pursey pers comm.).
3. Several informal walking tracks through the remnant vegetation that connect the cleared recreational area to Garnett Street and John Street (Plate 6).

The aerial photographs do not show any evidence of historical contaminating land uses. Based upon the existing and historic uses, the only potential source of contamination is the telecommunications facility in the northern part of the site. Recommendations regarding the removal of this facility are provided in Section 6.

Plate 1 Recreation area (1)

Plate 2 Recreation area (2)

Plate 3 Recreation area (3)

Plate 4 Recreation area (4)

Plate 5 Telecommunications infrastructure

Plate 6 Informal walking tracks

4.2 HYDROLOGY

4.2.1 Groundwater

The hydrogeology of the site area comprises Plantagenet Group formations of Pallinup Siltstone (siltstones, spongolite and sandstone) underlain by the Werillup Formation (limestone, siltstone, sandstone, peat, shale and basal conglomerate) (Dodson 1996).

The site is underlain by the Bremer West aquifers, comprising fractured rock, sedimentary and superficial formations (Table 2) (Dodson 1996, DoW 2011). Groundwater salinity in the area ranges from 3000–7000 mg/L, and is brackish to saline (DoW 2011). Groundwater depth is expected in the region of 5–20 m below ground level (Dodson 1996).

A search of the Water Information Network (WIN) database indicates that DoW constructed a number of bores to the north and east of the site in 2007. These bores were monitored between 2007 and 2009. The database information for these bores is incomplete and it is unclear as to the depth to which the bores were drilled and which aquifer(s) are intersected. Because of this, it is not possible to determine whether the bores are suitable for use in a monitoring program to support a LWMS.

Table 2 Hydrogeology

Aquifer Name	Description
Bremer West Fractured Rock	The fractured rock consists largely of granite and gneiss with greenstone rocks in the Ravensthorpe area and metamorphosed sandstones in the Fitzgerald National Park.
Bremer West Sedimentary	Aquifers in the Bremer Basin are formed in the Pallinup Siltstone, and principally in the basal Werillup Formation. These sediments overlie a buried topography of granite headlands and islands, so that the Werillup Formation is not continuous laterally.
Bremer West Superficial	The superficial aquifer refers mainly to the sand and calcarenite dunes along the coast. They overlie sedimentary rocks of the Bremer Basin or fractured rocks which are principally granite and gneiss. The superficial sediments are developed particularly at Albany, Bremer Bay, Hopetoun, Esperance, and Gibson for town water supply. In these areas the aquifer overlies, and to a certain extent is in contact with, the underlying sedimentary rocks. The salinity is fresh to brackish and overlies and abuts salt water which connects with the sea.

Source: DoW 2011

Public Drinking Water Source Areas

The portion of the site south of Borden - Bremer Bay Road is located in a Priority 3 PDWSA (DoW 2007) (

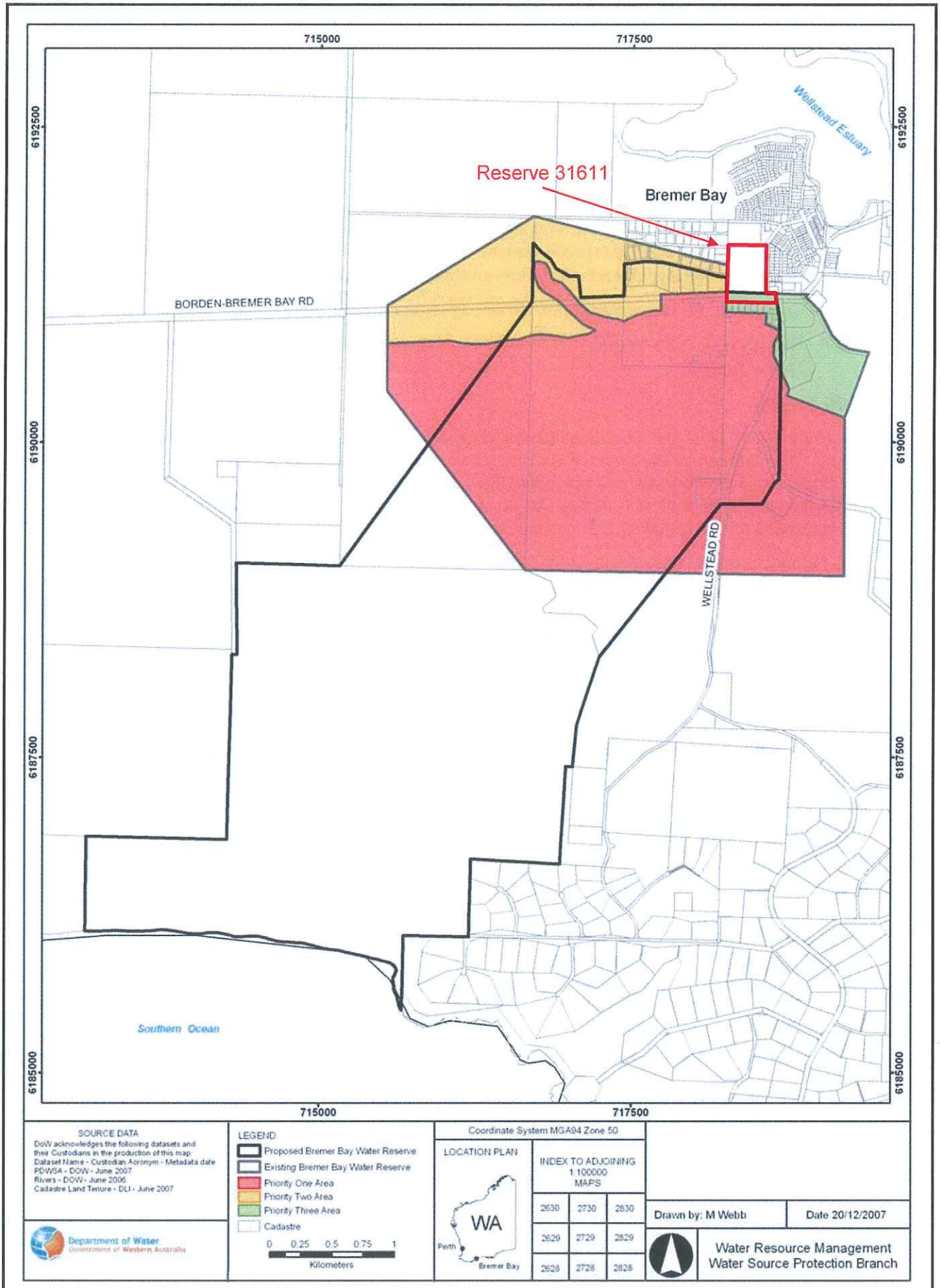
Figure 3). The majority of land southwest of the site is contained within a Priority 1 PDWSA. The boundary of the Priority 1 PDWSA terminates at the southeast corner of the site. A Priority 2 PDWSA lies immediately to the west of the site, and a Priority 3 area to the south. There are no buffers to Priority 1 or 2 PDWSA areas.

Groundwater bores for the town supply are located to the south-east and west of the site.

4.2.2 Surface water

No significant surface water features are located on the site. The majority of the site drains in a north-easterly direction, towards the corner of John Street and the unmade Garnett Road. The southern portion of the site drains in a southerly direction, towards Gnombup Terrace. The Bremer River is located approximately 500 m north of the site.

Areas of surface waterlogging have been noted within the neighbouring primary school sports oval area in winter, indicative of poor drainage in the area (Opus International 2010).



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Public Drinking Water Source Areas

FIGURE 3

4.3 VEGETATION AND FLORA

4.3.1 Surveys and investigations

The Proposal area has been subject to a number of flora and vegetation surveys undertaken to map the vegetation communities and flora species present and identify any vegetation communities and flora species of conservation significance. Key flora and vegetation surveys of the Proposal area include:

- Craig 2010: *Flora and Vegetation Survey, Proposed Bremer Bay Townsite Development*
- Hickman 2011: *Bremer Bay Reserve 31611, Threatened Flora and Opportunistic Fauna Spring Survey.*

2010 Survey

The Craig (2010) Flora and Vegetation Survey consisted of a desktop assessment and spring field survey. The objective of the survey was to record and map the vegetation units and vegetation condition within the Proposal area and record the location of DRF and Priority Flora. The survey was undertaken in March 2010, not suitable for survey of annual species, therefore a spring survey was recommended for the completion of a comprehensive species list.

This report is provided in Appendix 2 for further reference.

2011 Survey)

The Hickman (2011) Threatened Flora Spring Survey consisted of a desktop assessment and spring field survey. The objective of the survey was to undertake a targeted spring flora and vegetation survey for DRF and Priority Flora and augment the Craig (2010) survey through more suitable timing.

This report is provided in Appendix 3 for further reference.

4.3.2 Vegetation complexes

The site occurs within the Qualup vegetation system associated with the coastal hinterland. The dominant vegetation association here is a mallee-heath *Eucalyptus pleurocarpa* (Tallerack) association (e26SZc) derived from Beard (1976).

Current estimates of clearing within this vegetation association have been determined (Table 3 and Table 4).

Table 3 Regional vegetation extent

Vegetation Association (Beard 1976)	Regional Pre-European Extent (ha)	Regional Current Extent (ha)	Regional % Remaining
e26SZc - Shrublands; Tallerack mallee-heath	1,002,113	35,909	35

Source: Craig (2010)

Table 4 Site vegetation extent

Vegetation Association	Site Pre-European Extent (ha)	Site Current Extent (ha)	Site % Remaining
e26SZc	10.6	7.0	66

Source: Land Assessment (2009)

Of the remaining proportion of Vegetation Association e26SZc, approximately 7.0 ha is located on the site, representing 66 % of the original site extent.

Environmental Protection Authority (EPA) Position Statement No. 2 (EPA 2000) states that the "threshold level" below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being at a level of 30% of the pre-clearing extent of the vegetation type. A level of 10% of the original extent is regarded as being a level representing "endangered". Any clearing which would put the threat level into the "endangered class" should be therefore be avoided.

At approximately 35% of the remaining regional vegetation extent (Table 3), Vegetation Association e26SZc is neither endangered (<10%) or below the 30% threshold, indicating that it may not be regionally significant in terms of its conservation status.

4.3.3 Vegetation types

Five vegetation types were recorded within the intact remnants of the survey area as follows (Figure 4):

1. Eple – very open mallee heath characterised by *Eucalyptus pleurocarpa.*
2. Eang – patches of tall mallee characterised by *Eucalyptus angulosa.*
3. Edec – patches of tall mallee characterised by *Eucalyptus decipens* subsp. *adesmophloia.*
4. Pmax – thickets of *Phymatocarpus maxwellii.*
5. Batt – tall shrubland characterised by *Banksia attenuata* over low heath (Craig 2010; Hickman 2011).

The majority of the remnant vegetation across the site was in very good to excellent condition (Figure 5) (Hickman 2011).

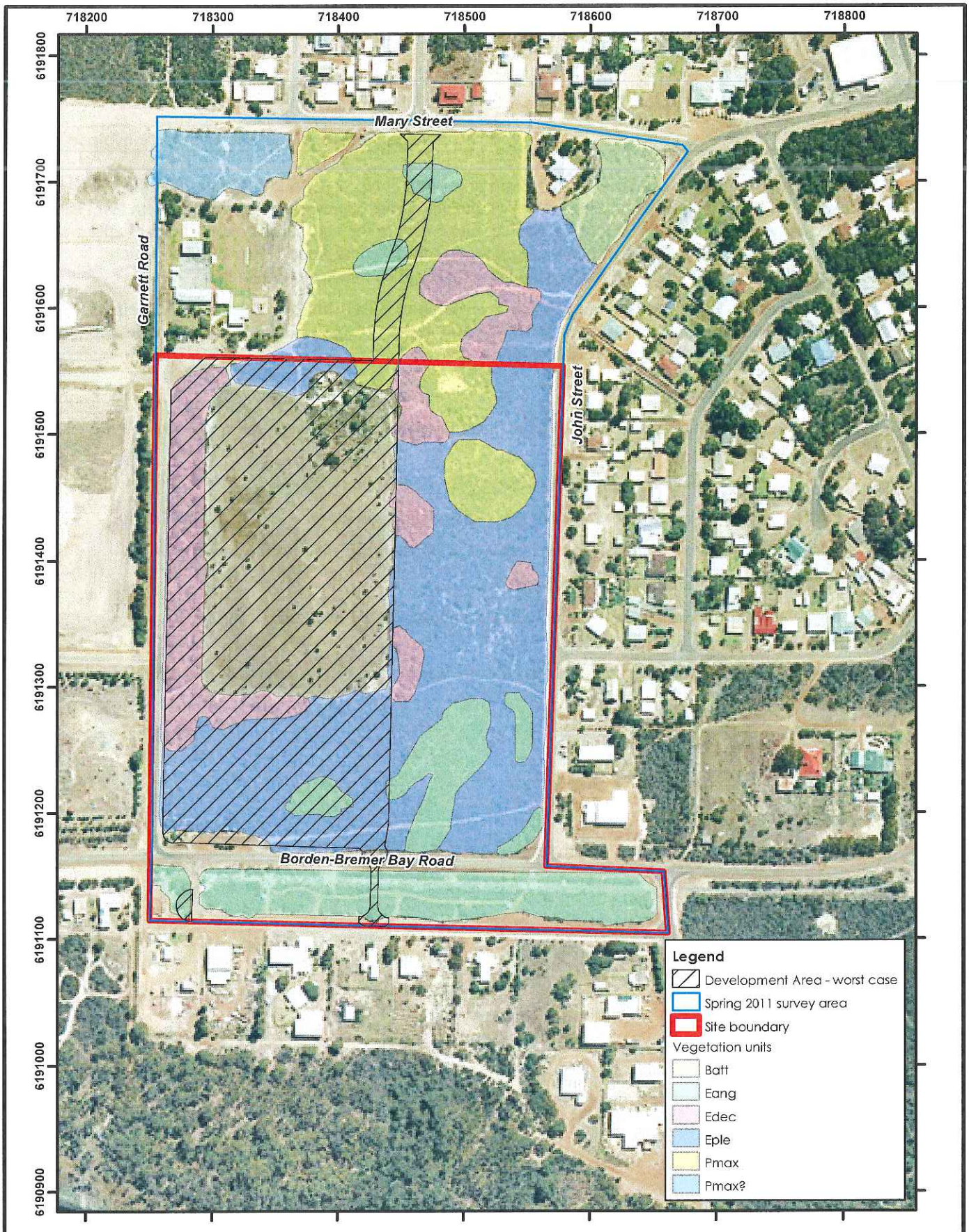

Figure 4 Vegetation units of Bremer Bay Townsite

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Scale
0 50 100
Metres

N

1:4,000
at A4

Coordinate System: GDA 1994 MGA Zone 50
Date: 8/02/2012
Author: JCrute

Source:
Aerial image, cadastre: Cardo 2011
Flora, vegetation: E. Hickman 10/2011
Note that positional errors may occur in some areas

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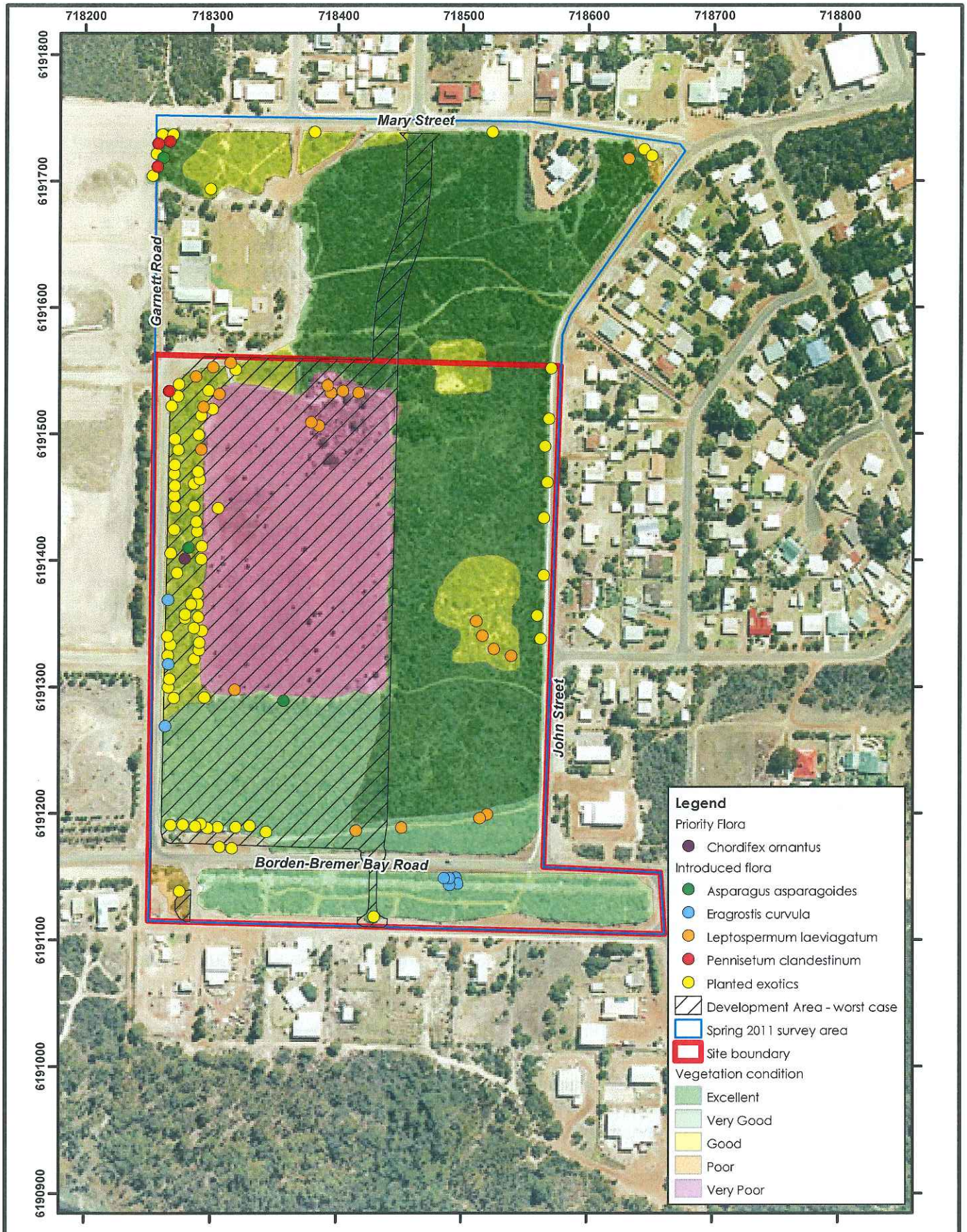

Figure 5
Vegetation condition and location of flora species of Bremer Bay Townsite

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Scale
0 50 100
Metres
N
1:4,000
at A4

Coordinate System: GDA 1994 MGA Zone 50
Date: 8/02/2012
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Source:
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Path: Q:\GIS\Consult\2010\LAN\LAN10184\ArcMap_Documents\Bremer_Bay_Town_Centre_PESI\LAN10184_01_Bremer Bay Town Centre PESI_RevB_F005.mxd

4.3.4 Flora

A total of 193 flora species from 34 families were recorded by Hickman (2011) (Appendix 3). The most representative families were Myrtaceae (33 taxa), Proteaceae (27), Fabaceae (25), Cyreraceae (15) and Orchidaceae (13). The dominant families were Poaceae (grass family), Asteraceae (daisy family), Myrtaceae (myrtle family) and Papilionaceae (pea family).

No Declared Rare Flora were recorded on site (Craig 2010, Hickman 2011). One Priority Two species, *Chordifex ornatus*, was identified on the site (Figure 4). *C. ornatus* has not been previously collected from the Bremer Bay area and predominantly occurs at localized sites at Tambellup and South Stirling (Craig 2010). This finding also represents a significant range extension for this species (Craig 2010).

The survey recorded 14 introduced weed species, including plantings of non-endemic Eucalypts, Myrtaceous and Proteaceous shrubs (Hickman 2011) (Figure 4).

Weeds noted on the site included Bridal Creeper (*Asparagus asparagoides*), a weed of National Significance, and African Lovegrass (*Eragrostis curvula*), which is a Declared Weed under the *Agriculture and Related Resources Act 1976 (WA)* (ARRP Act).

The Bremer Bay townsite and associated farmlands represent a 'pinch point' of cleared land between the intact native vegetation, which extends to Albany to the south-west and through Fitzgerald River National Park to Esperance and the Great Western Woodlands to the east (Hickman 2011). .The native vegetation on the site is considered by the DEC to be a key link between these two areas (B Bone B [DEC] 2010, pers. comm.).

There are no known Environmentally Sensitive Areas present on or adjacent to the site.

4.4 FAUNA

The proposal area comprises a series of remnant vegetation habitats. The dominant habitat type across the area is open mallee heath.

The vegetation types on the site do not appear to be restricted in distribution, suggesting that the general fauna habitat types are likewise more broadly distributed. None of the habitat types identified are listed as Threatened Ecological Communities.

4.4.1 Potentially occurring significant fauna

Searches of DEC and WA Museum fauna databases were completed by Hickman (2011) to identify species, including those of elevated conservation status that may potentially occur in the proposal area. The searches indicated that four fauna species listed under the *Wildlife Conservation Act 1950* (WA) and four fauna species listed under the DEC Priority Fauna list could possibly occur or were likely to occur on the site (Table 5).

Based on the particular range of habitats present on the site, the species identified in the searches are considered likely to occur in the proposal area include Carnaby's Black Cockatoo, Dibbler, Quenda, Tammar, Shy Heathwren (western subspecies) and the Western Brush Wallaby (Table 5). To confirm that any of these species use the survey area a more detailed fauna survey would be required. A detailed fauna survey, including trapping, was not undertaken on the site.

Table 5 Terrestrial fauna species of elevated conservation status that may potentially occur

Species Name	Common Name	Conservation Status	Likelihood of occurrence (after Hickman 2011)
Bettongia penicillata subsp.*ogilbyi*	Brush-tailed Bettong, Woylie	Threatened	Unlikely – site does not include preferred open forest and woodland habitat.
Calyptorhynchus latirostris	Carnaby's Black Cockatoo	Threatened	Likely feeding habitat – site occurs within species range and contains suitable feeding species. Area does not contain the trees with the large, deep hollows that this species typically nests in.
Caretta caretta	Loggerhead Turtle	Threatened	Highly unlikely – site does not include marine habitat.
Dasyurus geoffroii	Western Quoll, Chuditch	Threatened	Possible – site contains suitable habitat, but species is typically restricted to the jarrah forests of the south-west and a few larger wheatbelt reserves.
Leipoa ocellata	Malleefowl	Threatened	Possible – site is isolated but contains suitable habitat.
Parantechinus apicalis	Dibbler	Threatened	Likely – site contains suitable habitat.
Phascogale calura	Red-tailed Phascogale	Threatened	Possible – known from remnant vegetation in the wheatbelt.
Pseudocheirus occidentalis	Western Ringtail Possum	Threatened	Unlikely – species rarely occurs east of Albany.
Pseudomys shortridgei	Heath Mouse/ Heath Rat	Threatened	Possible – area contains kwongan heath vegetation.
Arctocephalus forsteri	New Zealand Fur Seal	Specially protected fauna	Highly unlikely – site does not include marine habitat.
Isoodon obesulus subsp. *fusciventer*	Southern Brown Bandicoot/ Quenda	Priority 5	Likely – area contains suitable habitat.
Macropus eugenii subsp. *derbianus*	Tammar	Priority 5	Likely – area contains suitable habitat.
Charadrius rubricollis	Hooded Plover	Priority 4	Unlikely – species inhabits ocean beaches, coastal lakes and inland salt lakes.
Hylacola cauta subsp. *whitlocki*	Shy Heathwren (western subspecies)	Priority 4	Likely – site contains suitable habitat.
Macropus irma	Western Brush Wallaby	Priority 4	Likely – known to occur in similar habitat.

4.5 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Based on a search of the EPBC Act *Protected Matters Search Tool* (DSEWPAC 2011a), there are several threatened species potentially present on site that may be impacted as a result of development (Appendix 4). Of the identified species, 12 species may occur on site (Table 6).

Table 6 EPBC species occurrence

Species	Status	Habitat description	Likelihood of occurrence	Justification
BIRDS				
Calyptorhynchus latirostris (Carnaby's Black Cockatoo)	Endangered	Carnaby's Black-Cockatoo is endemic to the southwest of Western Australia, extending from the Murchison River to Esperance, and inland to Coorow, Kellerberrin and Lake Cronin (DEC 2011a). Carnaby's Black- Cockatoo occurs in uncleared or remnant areas of eucalypt woodland, principally salmon gum or wandoo, and shrubland or kwongan heath (DEC 2011a). The cockatoos feed on the seeds of a variety of native and introduced plants (*Banksia, Hakea, Grevillea, Allocasuarina, Eucalyptus* and *Pinus* spp.), nectar from flowers of *Lambertia, Callistemon, Banksia* and *Eucalyptus*, and insect larvae (DEC 2011a).	Likely feeding habitat	Site occurs within species range and contains suitable feeding habitat.
Dasyornis longirostris (Western Bristlebird)	Vulnerable	The Western Bristlebird is restricted to floristically diverse low dense coastal heathland (SEWPAC 2011b). Western Bristlebirds occur in heathland that is 0.5–1.5 m tall, comprising a diverse variety of shrubs such as *Banksia, Melaleuca, Hakea, Lambertia* and other species (SEWPAC 2011b).	Possible	Site may contain suitable habitat.
Leipoa ocellata (Malleefowl)	Endangered	The remaining malleefowl range is highly fragmented, extending across southern Australia, from coastal Western Australia through South Australia and north-western Victoria to central New South Wales. In Western Australia, malleefowl has been recorded in Fitzgerald River National Park (DEC 2011b). Malleefowl are largely confined to arid and semi-arid woodland that is dominated by mallee eucalypts on sandy soils (DEC 2011b). They may also be found in coastal heath where shrubs produce sufficient leaf litter for use in nest mounds (DEC 2011b).	Possible	Site occurs within species range.
Pezoporus wallicus flaviventris (Western Ground Parrot)	Endangered	The Western Ground Parrot has a fragmented distribution in coastal south-eastern and south-western parts of the continent (Burbidge et al 1997). Studies suggest its distribution is restricted to five subpopulations in the northern part of Fitzgerald River National Park and one population in Cape Arid National Park (Burbidge et al 1997). The vegetation types used by Western Ground Parrots can be broadly characterised as low coastal and near coastal heathlands (Burbidge et al 1997).	Possible	Site occurs within species range.
MAMMALS				

Species	Status	Habitat description	Likelihood of occurrence	Justification
Dasyurus geoffroii (Chuditch, Western Quoll)	Vulnerable	The chuditch now has a patchy distribution throughout the jarrah forest and mixed karri/marri/jarrah forest of southwest Western Australia (DEC 2011c). The chuditch also occurs in very low numbers in the Midwest, Wheatbelt and South Coast Regions (DEC 2011c). Chuditch are known to have occupied a wide range of habitats from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts (DEC 2011c).	Possible	Site may contain suitable habitat.
Parantechinus apicalis (Dibbler)	Endangered	The dibbler is currently known from Whitlock and Boullanger Islands, Jurien Bay, and Fitzgerald River National Park on the south coast (DEC 2011d). Dibblers typically occupy heath and mallee-heath vegetation communities (DEC 2011d).	Likely	Site may contain suitable habitat.
Phascogale calura (Red-tailed Phascogale)	Endangered	Populations are currently known from several isolated nature reserves in the south-west of Western Australia and have also been recorded on the south coast near Ravensthorpe (DEC 2011e). The Red-tailed Phascogale inhabits wandoo (*Eucalyptus wandoo*) and Sheoak (*Allocasuarina huegeliana*) woodland associations, with populations being most dense in the latter vegetation type (DEC 2011e).	Possible	Site may contain suitable habitat.
PLANTS				
Anigozanthos bicolor subsp. *minor* (Little Kangaroo Paw, Two-coloured Kangaroo Paw)	Endangered	Rhizomatous, perennial, herb that grows in sand on well-watered sites (WAH & DEC 2011).	Possible	Not surveyed on site. Within known distributions, site contains suitable soil types and vegetation associations.
Boronia clavata (Bremer Boronia)	Endangered	Upright, slender shrub that grows in alluvial sand & loam (WAH & DEC 2011). Occurs in floodplains & river beds (WAH & DEC 2011).	Unlikely	No floodplains or riverbeds occur within project area.
Centrolepis caespitosa	Endangered	Tufted annual, herb that grows in white sand and clay (WAH & DEC 2011).Occurs in salt flats and wet areas (WAH & DEC 2011).	Possible	Not surveyed on site. Within known distributions.
Chordifex abortivus (Manypeaks Rush)	Endangered	Rhizomatous, erect perennial, herb that grows in sand (WAH & DEC 2011).Occurs in low rises & undulating areas (WAH & DEC 2011).	Possible	Not surveyed on site. Within known distributions.
Kennedia glabrata (Northcliffe Kennedia)	Vulnerable	Prostrate shrub that grows in sandy soils (WAH & DEC 2011). Occurs in granite outcrops (WAH & DEC 2011).	Possible	Not surveyed on site. Within known distributions.

4.6 HERITAGE

4.6.1 European heritage

A search of the *Australian Heritage Database* (National Trust of Australia 2011) and the *Places Database* (HCWA 2011) indicates the presence of one site of European heritage significance in the vicinity of the site. The Bremer Bay Telegraph Station is located near the corner of John Street and Bremer Bay Road (Location 885).

4.6.2 Aboriginal heritage and native title

A search of the *Aboriginal Heritage Inquiry System* (DIA 2011) identifies one site of Aboriginal heritage significance in the vicinity of the site. This site is identified as Bog Arm (Site ID 4981) and contains artefacts/scatter. It is located approximately 500 m north of the site.

The search indicates that no surveys for Aboriginal heritage have been undertaken on the site (DIA 2011).

The former vesting of the site for recreation with the Shire of Jerramungup would in all likelihood have extinguished native title. This could be confirmed with the Department of Regional Development and Lands if required.

5. POTENTIAL ENVIRONMENTAL IMPACT AND MANAGEMENT RESPONSE

5.1 TOPOGRAPHY, GEOLOGY AND SOILS

The development of the site is anticipated to be sewered (Harris B [Porter Consulting Engineers] 2012, pers. comm. February 3). The site appears to be generally suitable for sewered development from a geotechnical perspective. The hydraulic conductivity of the local soils is poor (Douglas Partners 2011). Infiltration on site is likely to be limited, which may be a constraint for the use of infiltration on site for stormwater management and on site disposal of wastewater.

Acid sulphate soils are considered unlikely to occur on the site. No additional work is anticipated to be required to address this issue.

An existing telecommunications compound is located on the northern boundary of the site (refer Section 4.1.2). The infrastructure is due to be decommissioned sometime during 2013 (Craig Pursey pers comm.). During the site investigation it was noted that the walls of shed within the compound were constructed of fibrous-cement panels. Access to the shed was not provided during the investigation. Depending on the equipment used, telecommunications centres can be potential sources of contaminants including metals, polychlorinated biphenyls (PCBs), volatile organics, semi-volatile organics and metals that may contaminate soil and groundwater on the site.

5.1.1 Management response

Drainage management on the site will need to consider the implications of low infiltration rates. Some forms of stormwater disposal, such as soakwells, may not be feasible or will require the installation of a sand layer to enhance infiltration. These issues should be addressed in the Local Water Management Strategy (LWMS).

It is recommended that the telecommunications facility be investigated for the presence of asbestos and potential sources of contamination prior to demolition. This should include discussions with Telstra regarding the history of the site and potential use or storage of contaminated materials on the site.

Changing the land use to a residential or recreational area could potentially increase the risk of human exposure to any contaminants on the site. Because of this, a Preliminary Site Investigation may be required for the facility prior to a change in land use.

5.2 HYDROLOGY

Geotechnical investigations confirm the presence of an impervious layer of stiff clayey sand and sandstone under the site. Advice from the Department of Water is that the clay layer, which creates seasonal inundation should not be considered as the groundwater table. The superficial aquifer below the clay layer should be regarded as the groundwater table (McKeough K [DoW] 2011, pers. comm. 21 April).

The area south of Borden – Bremer Bay Road is a Priority 3 PDWSA. The objective of a Priority 3 PDWSA is to 'ensure that there is no increased risk of pollution to the water source (WAPC 2003). Most land uses, including sewered residential development, are permitted in Priority 3 areas (DoE 2004). Highly contaminating land uses such as abattoirs and landfills would not be permitted in this area (DoE 2004).

5.2.1 Management response

Water will be managed in accordance with *Better Urban Water Management* (WAPC 2008).

5.3 VEGETATION AND FLORA

Vegetation removal is the main aspect of the potential development that has the greatest potential to affect vegetation and flora values on site. Removal of vegetation for the development will directly disturb vegetation communities.

The current concept for the development has been designed to keep vegetation clearing to the minimum required to allow construction of the town site facilities. New disturbance will comprise approximately 3.56 ha, including clearing for roads, retail and civic areas. The proposed design retains the important connectivity between the vegetation to the south and to the north-east of the site (Figure 2).

Taking into consideration the likely regional distribution of vegetation types occurring in the proposal area and the relatively small area of disturbance required (3.56 ha), the proposal is expected to have only a local impact to the vegetation types present (Table 7).

Table 7 Areas of vegetation types disturbed by potential development site

Vegetation type	Area (ha)
Eang	0.25
Edec	1.06
Eple	1.90
Pmax	0.36
Total	**3.56**

Other activities or aspects of the potential development that may affect vegetation and flora values include:

- vehicle and earth movements, which could potentially introduce weed species
- dust generation during earthworks and clearing, which may potentially smother vegetation, thereby retarding growth.

5.3.1 Management response

Vegetation and flora within the site will be protected through the implementation of the following management actions:

- ensure that clearing is as approved and is kept within the proposal area
- minimise disturbance through planning and location of infrastructure within already disturbed areas.
- rehabilitate areas disturbed for construction not required to remain disturbed
- fire management plan to be developed for the site
- hygiene management actions:
    - establish and maintain an inventory recording the location of weed species within the proposal area
    - inspect sites to record new observations of weed infestations or dieback infestation
    - undertake staff inductions to include information on identification and reporting of weeds and procedures to prevent the spread of weeds and dieback infestation
    - implement weed and dieback hygiene measures as required for machinery entering and leaving the site
    - minimise site disturbance by preventing unnecessary clearing of vegetation
    - implement weed control for targeted weed species as required.

5.4 FAUNA

Vegetation removal is the main aspect of the potential development, which may affect terrestrial fauna values at the site. Clearing will directly disturb terrestrial fauna habitat and may result in the loss of individual terrestrial fauna.

Terrestrial fauna rely on native vegetation and physical aspects of the landscape to provide food, shelter and breeding sites. The loss or degradation of native vegetation and physical disturbance to the landscape may reduce the capacity of the habitat to support the range of species it would in an otherwise undisturbed state.

Vegetation in the townsite and surrounding farmlands is important to retain connectivity between the vegetation to the east and west for both fauna and flora.

Approximately 3.56 ha of relatively disturbed fauna habitat will be cleared as part of the current development concept. The majority of the vegetation types on the site do not appear to be restricted in distribution within the Bremer Bay locality, suggesting that the fauna habitats are likewise more widely distributed. However, clearing on the site should be managed to maintain the connectivity between vegetation to the south of Borden Bremer Bay Road and north of Mary Street.

5.4.1 Management response

Terrestrial fauna on site will be protected through the implementation of the following management actions:

- implementing and sign-posting appropriate speed limits during earthworks and construction for plant and machinery
- controlling feral animals
- ensuring that clearing of potential fauna habitat is as approved and is kept within the designated area
- rehabilitate areas disturbed, which are not required to remain disturbed permanently.

5.5 HERITAGE

No sites of European heritage or Aboriginal heritage significance are located on the site.

As no surveys for Aboriginal Heritage have been conducted, there is a risk that works on the site may uncover a previously unknown heritage site. It is therefore recommended that an Aboriginal heritage survey of the site is conducted prior to construction.

6. CONCLUSIONS AND RECOMMENDATIONS

Environmental conditions on the site are considered to be generally suitable for development. There are no fatal flaws or major constraints to development. Issues that need to be addressed prior to development are:

1. Drainage and urban water management will need to be addressed through the development of a LWMS at the Local Structure Plan (LSP) stage and a Urban Water Management Plan (UWMP) at the subdivision stage.
2. Undertaking a fauna survey and targeted flora survey to support the EPBC Act referral of the property.
3. Possible contaminated sites investigations prior to decommissioning of the telecommunications compound.
4. Preparation of a Fire Management Plan for the site in accordance with the WAPC and FESA (2010) guidelines.
5. Possible Aboriginal heritage survey to confirm that heritage sites are not present in the area.

6.1 LOCAL WATER MANAGEMENT STRATEGY

A (Draft) LWMS has been prepared previously for the site by Opus (2010).

Strategen understands that at this time the development is intended to be a two-lot subdivision. It is understood that a LSP will need to be prepared for the development, which will require the preparation of a LWMS. To enable the preparation of the LWMS, DoW (2008) advise that up to 18 months (including two winters) of groundwater and surface water monitoring is undertaken.

The LWMS prepared by Opus (2010) did not include the groundwater and surface water monitoring required by the DoW (2008) guidance. To ensure that the LWMS prepared as part of the LSP application meets WAPC requirements, it is recommended that both shallow and deep groundwater monitoring bores are installed at least two years prior to the intended date of submission of the LSP. The shallow monitoring bores should be screened above the clay layer to monitor the perching of water during winter. The deep bores should be screened into the deeper superficial aquifer in order to monitor the seasonal variation in the groundwater levels.

A LWMS also needs to reflect the development layout and drainage design proposed by the LSP (DoW 2008).

Once the initial sub-division has occurred the Shire of Jerramungup may proceed with a less than 30 lot subdivision. Given the constraints to water management on the site, it is likely that any plans for subdivision would trigger the requirement for an UWMP. Additional monitoring is not required for a UWMP, but a detailed drainage design will be required to support the document.

6.2 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the environmental assessment provisions of the EPBC Act, 'actions' (such as this development) that are considered likely to have a significant impact to one or more Matters of NES protected under the EPBC Act are subject to an assessment and approvals process by DSEWPAC. 'Actions', including clearing, that may significantly impact upon Matters of NES are required to be referred to DSEWPAC. An action that is considered to have a significant impact is deemed a 'controlled action' and will require formal assessment by DSEWPAC.

The site potentially contains 12 species that are listed as Matters of NES. Before clearing occurs, it is recommended that a Level 2 fauna field survey is undertaken and targeted assessment of fauna habitat, including key plant species potentially occurring on the site area is undertaken

Carnaby's Black Cockatoo is a species of particular concern for DSEWPAC in the south-west of Western Australia. Recent draft guidelines indicate that clearing of one hectare of quality foraging habitat may be considered to have a significant impact on the species (DSEWPAC 2011c).

Given the information to date and size of the Proposal area, DSEWPAC should be consulted to seek advice on whether an EPBC Act Referral is required prior to clearing of the site.

6.3 DECOMMISSIONING OF TELECOMMUNICATIONS COMPOUND

An existing telecommunications compound is located on the northern boundary of the site (refer to Section 4.1.2). The infrastructure is due to be decommissioned sometime during 2013 (Pursey C [SoJ] 2012, pers. comm. 8 February). During the site investigation it was noted that the walls of shed within the compound were constructed of fibrous-cement panels. Access to the shed was not provided during the investigation. Depending on the equipment used, telecommunications centres can be potential sources of contaminants including metals, polychlorinated biphenyls (PCBs), volatile organics, semi-volatile organics and metals that may contaminate soil and groundwater on the site.

It is recommended that the building be investigated for the presence of asbestos and potential sources of contamination prior to demolition. This should include discussions with Telstra regarding the history of the site and potential use or storage of contaminated materials on the site. A Preliminary Site Investigation may be required prior to the land being sold.

6.4 ABORIGINAL HERITAGE

There have been no Aboriginal Heritage surveys conducted of the site. As such, there is a risk of disturbing unknown sites during construction. It is therefore recommended that an Aboriginal Heritage survey of the site is conducted.

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Appendix 1
Historical aerial photographs

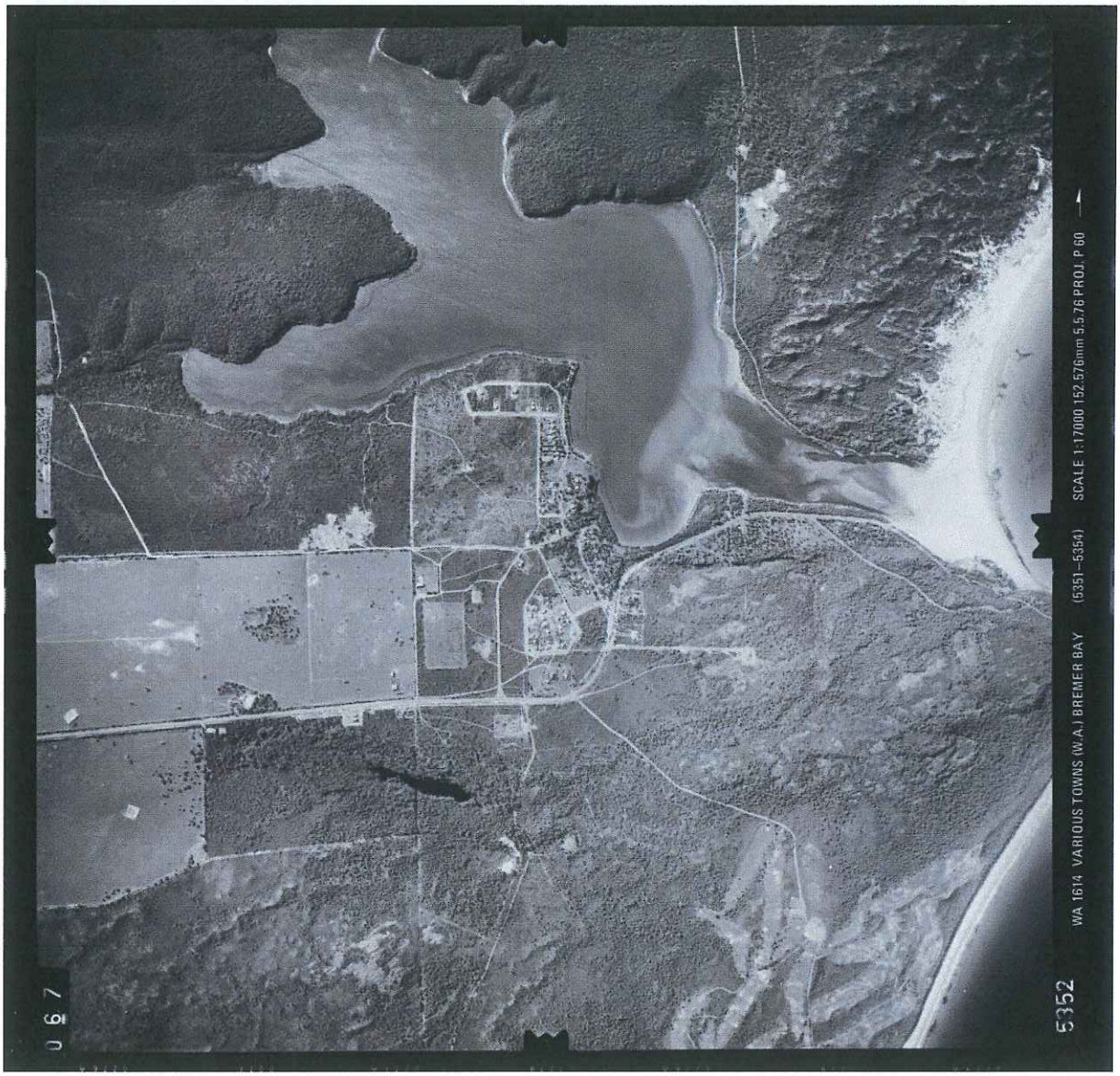
Source: Landgate

STRATEGEN	Preliminary Environmental Site Investigation Report Aerial photograph - 1957	Plate A-1

Source: Landgate

STRATEGEN	Preliminary Environmental Site Investigation Report Aerial photograph - 1969	PLATE A-2

strategen
Plate 2 - Aerial photograph - 1969 Feb-2012



Source: Landgate

STRATEGEN	Preliminary Environmental Site Investigation Report Aerial photograph - 1976	Plate A-3

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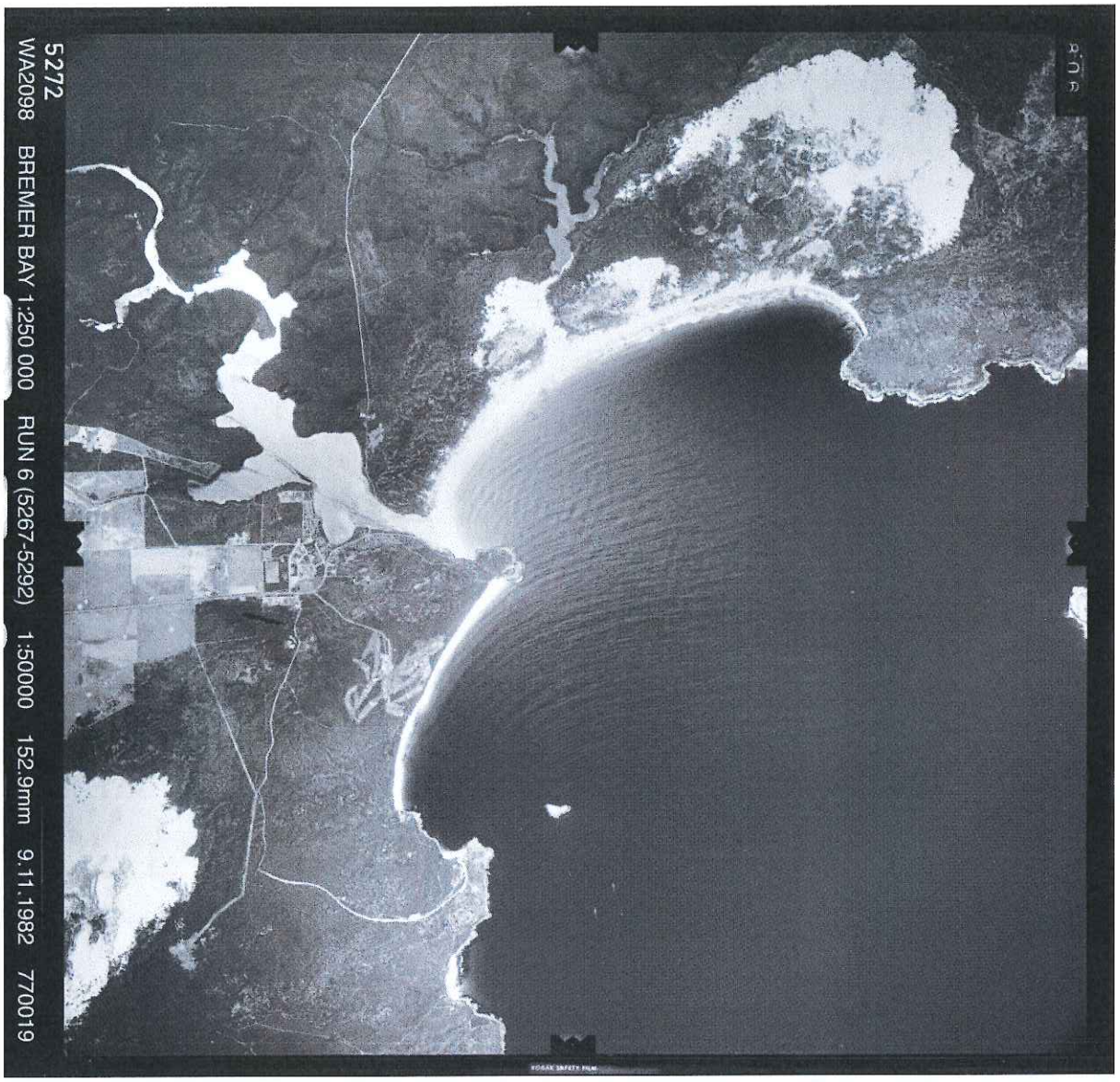
Plate 3 - Aerial photograph - 1976 Feb-2012



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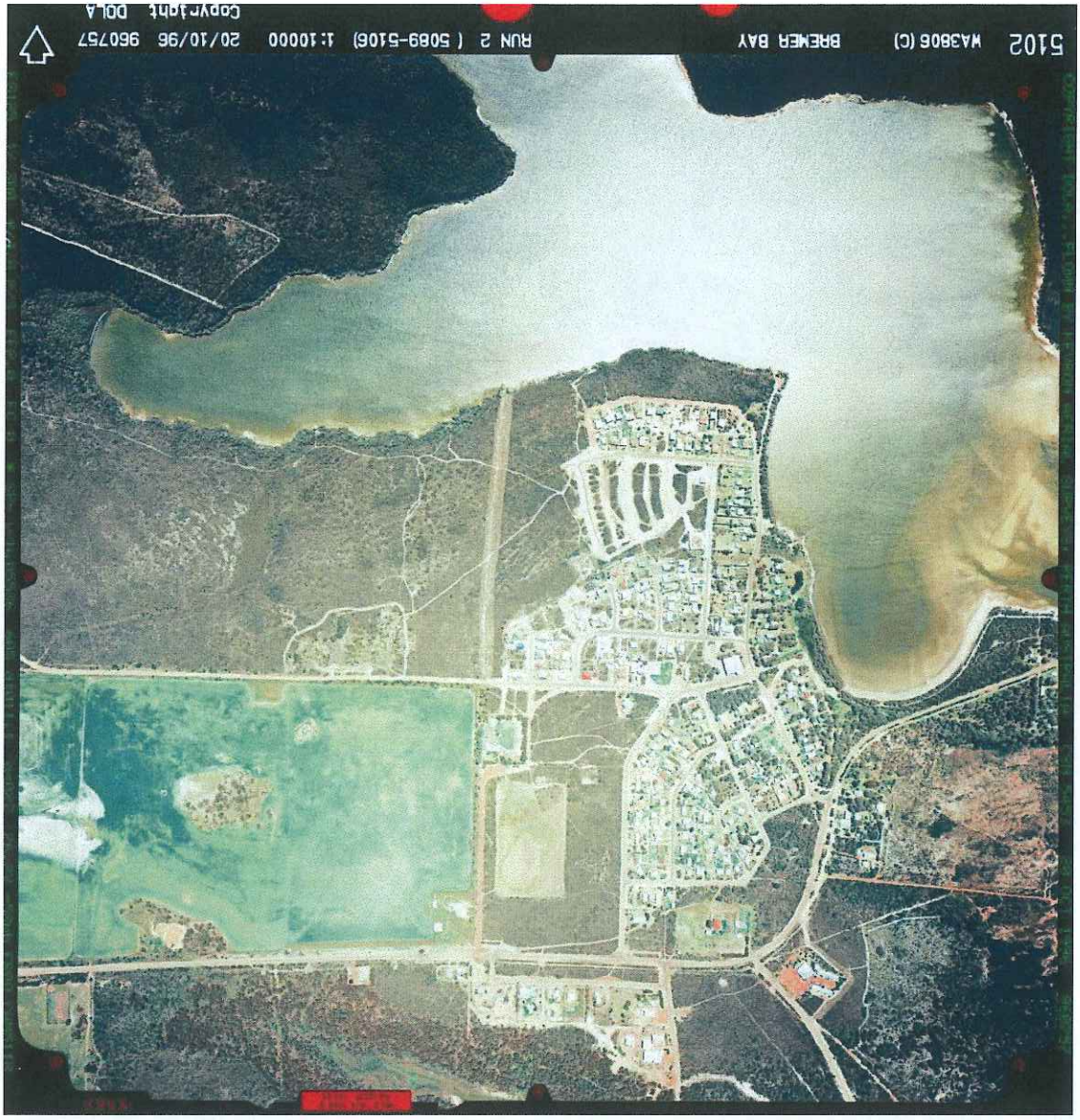
STRATEGEN	Preliminary Environmental Site Investigation Report Aerial photograph - 1982	Plate A-4



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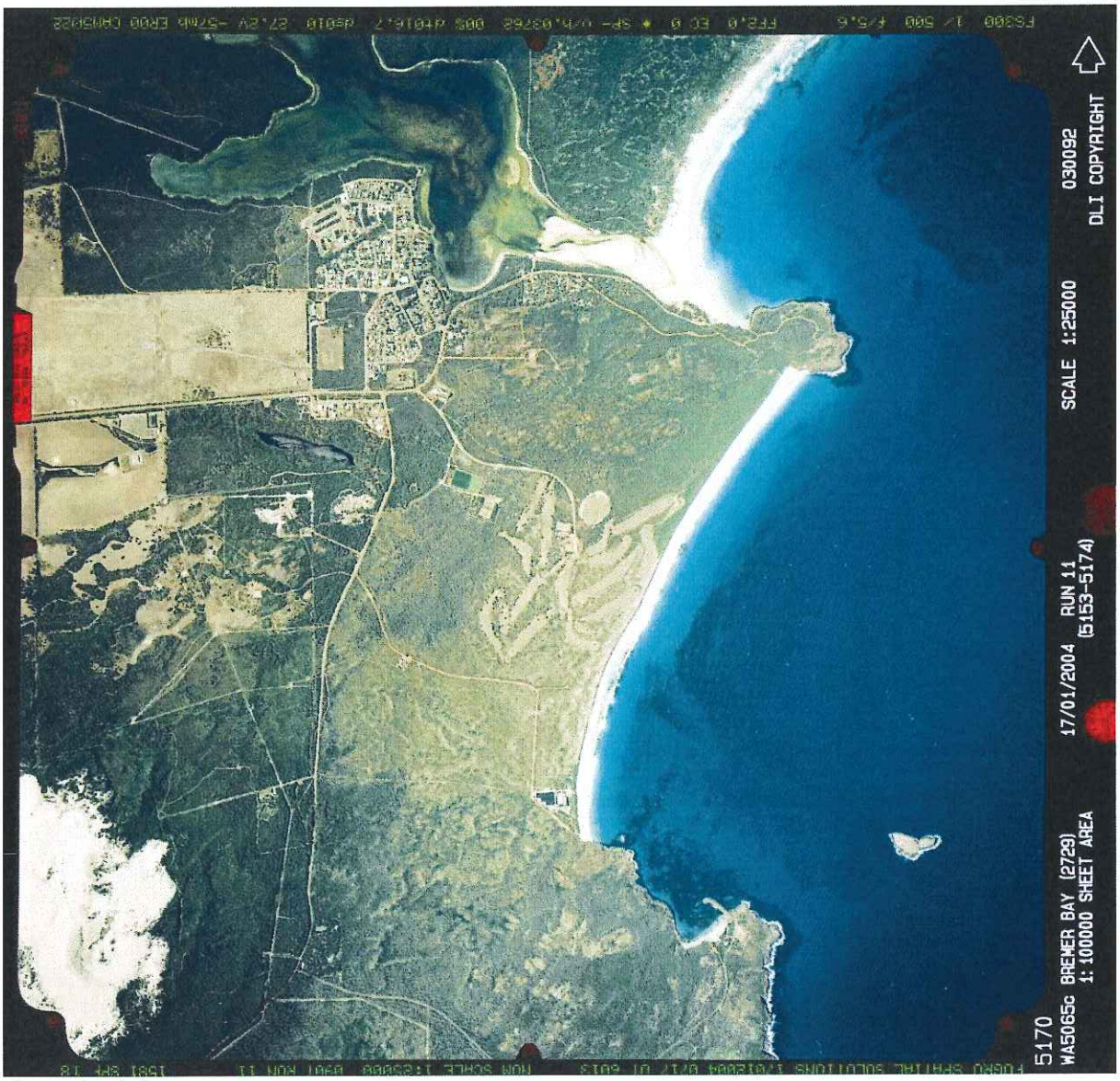
STRATEGEN	Preliminary Environmental Site Investigation Report Aerial photograph - 1996	Plate A-5



Source: Landgate

STRATEGEN	Preliminary Environmental Site Investigation Report Aerial photograph - 2004	Plate A-6

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Plate 6 - Aerial photograph - 2004 Feb-2012

Appendix 2
Bremer Bay Proposed Town Centre Development Vegetation & Flora Survey

Bremer Bay
Proposed Town Centre Development

Vegetation & Flora Survey

A report prepared for

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on behalf of

Shire of Jerramungup

June 2010

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DISCLAIMER

In undertaking this work, the author has made every effort to ensure the accuracy of the information used. Any conclusions drawn or recommendations made in the report and maps are done in good faith and the consultant takes no responsibility for how this information is used subsequently by others.

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Summary

Reserve 31611 is a Crown reserve and zoned 'Special Use' under the Shire of Jerramungup's Local Planning Scheme No.2 for Bremer Bay. It comprises approximately 10.6 ha and is located on the northern side of the Borden-Bremer Bay Road, between Garnett Road and John Street. The Shire proposes to develop the reserve as a Town Centre for Bremer Bay.

A report by Land Assessment Pty Ltd (2009) recommended that the Shire should seek and obtain a permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* from the Department of Environment and Conservation (DEC). Consequently, a botanical survey was requested to assist with the proposal.

The flora and vegetation survey found that Reserve 31611 contained no Declared Rare flora or Threatened Ecological Communities. The Priority Two species, *Chordifex ornatus,* was frequent on the reserve.

The majority of vegetation was in very good to excellent condition and provides a core linkage between the Coastal and Fitzgerald River Corridors (CALM 2002).

Recommendations

- Reserve 31611 is an ecological linkage between two areas of regional conservation significance (Coastal and Fitzgerald River corridors) and the native vegetation on it should be protected and enhanced;
- the native vegetation on Reserve 31611 forms an ecological linkage of only 120 m width. To maintain its viability and to prevent its function being impaired, no access roads or developments should occur on it;
- in consideration of the two points above, it is preferable that the proposed Bremer Bay Town Centre be developed on the land that has already been cleared with development restricted to the 'old school oval' site within the reserve;
- the proponent should review its proposed development against the EPA (2008) "checklist of management actions to protect native vegetation and flora" .

Introduction

Reserve 31611 is a Crown reserve and zoned 'Special Use' under the Shire of Jerramungup's Local Planning Scheme No.2 for Bremer Bay. It comprises approximately 10.6 ha and is located on the northern side of the Borden-Bremer Bay Road, between Garnett Road and John Street (Fig.1). The Shire proposes to develop the reserve as a Town Centre for Bremer Bay. Preliminary Structure Plans have been drafted by Gray and Lewis, Land Use Planners (2010) for Council discussion and public consultation.

A botanical survey was requested to assist with the planning proposal. A report by Land Assessment Pty Ltd (2009) recommended that the Shire should seek and obtain a permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* from the Department of Environment and Conservation (DEC). Permit applications need to consider impacts including, but not restricted to: biodiversity, rare flora, threatened ecological communities and level of remnant vegetation representation (EPA 2004).

An overview of environmental factors affecting the development was prepared as a desktop report by Land Assessment Pty Ltd (2009). In summary, with respect to flora and vegetation, the report found:

- Beard (1976) at 1:250 000 scale mapped the association 'Shrublands: tallerack mallee-heath' [e_{26}SZc], 35% of which remains extant on the South Coast. The *EPA Guidance Statement 33* (EPA 2008) triggers concern when less than 30% of the original vegetation association remains;

- 1:40 000 scale mapping by Newbey (1979) recorded the vegetation structure as 'Tall Open Shrubland' (2-8 m tall). Two plant associations were mapped (i) Tallerack *Eucalyptus pleurocarpa* [Eple] in the northern sector of the reserve, and (ii) Spongolite [S] in the south;

- a rectangular-shaped portion of the reserve has been cleared, leaving 66% (7 ha) of native vegetation;

- no Declared Rare (DRF) or Priority flora had been recorded on the DEC's databases. Within a nominal 10 km radius, two DRF and 26 Priority species were recorded from 48 locations;

- no Threatened Ecological Communities (TECs) were noted.

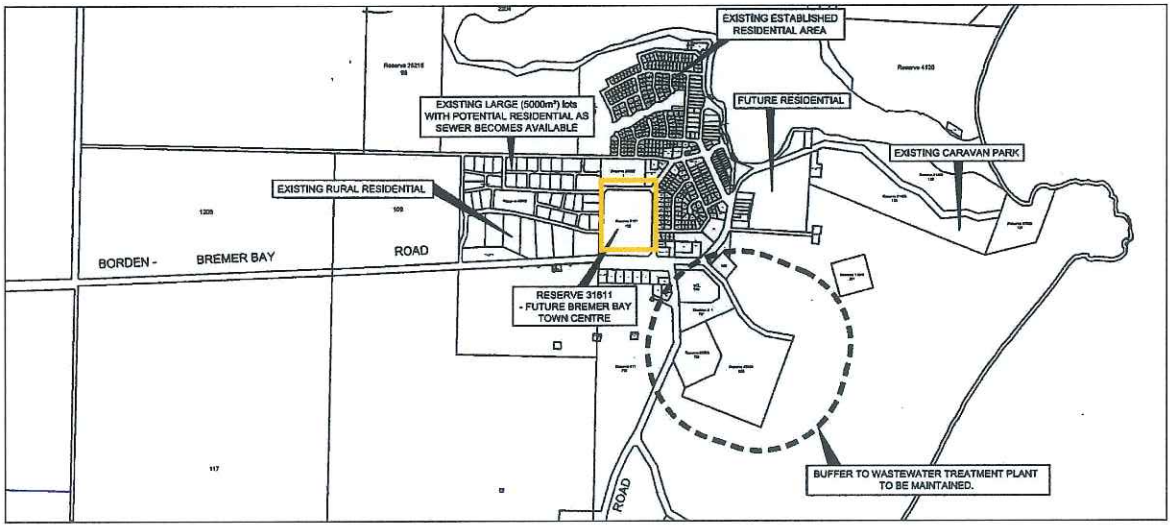

Figure 1 – Bremer Bay: location of Reserve 31611

Methods

Desktop

A list of potential species that could occur on Reserve 31611 was compiled from the report of Land Assessment Pty Ltd (2009). The Declared Rare Flora (DRF) and Priority flora which potentially occurred on the site (Table 1) was researched by securing a photo, line drawing or specimen for field identification. Appendix 1 outlines the meaning of the Department of Environment and Conservation's DRF and Priority flora listings.

Table 1. Declared Rare and Priority Flora potentially occurring on Reserve 31611

Conservation Code		Species
Smith (2010)	Land Assesssment (2009)	
	R	*Boronia clavata*
	R	*Eucalyptus nutans*
	1	*Conospermum coerulescens* subsp. *coerulescens*
	1	*Eucalyptus retusa*
	1	*Lissanthe synandra*
	1	*Schoenus* sp. Grey Rhizome (K.L. Wilson 2922)
	1	*Trymalium litorale*
	2	*Eucalyptus vesiculosa*
	2	*Hibbertia acrotrichion*
	2	*Melaleuca pritzelii*
	2	*Monotoca aristata* ms
	2	*Thomasia quercifolia*
	3	*Astroloma microphyllum*
	3	*Calectasia obtusa*
	3	*Eucalyptus newbeyi*
	3	*Lasiopetalum parvuliflorum*
	3	*Latrobea recurva*
	3	*Leucopogon blepharolepis*
	3	*Schoenus benthamii*
	3	*Sphaerolobium validum*
	3	*Stylidium pseudohirsutum*
	3	*Thysanotus gageoides*
	3	*Xanthosia peduncularis*
delete	4	*Acacia aemula* subsp. *aemula*
	4	*Acrotriche parviflora*
	4	*Eucalyptus calcicola* subsp. *unita*
delete	4	*Eucalyptus x erythrandra*
	4	*Pimelea physodes*

Following the field survey the list was updated (Smith 2010); Table 1 reflects the changes.

Ecological linkages were evaluated against the principles outlined by Molloy *et al.* (2009). Aerial photo Bremer 2729_23 captured on 11/1/2006 was used for the assessment.

Field Survey

Over two days (18th -19th March 2010) Reserve 31611 was traversed on foot with species composition noted. Plant specimens were taken for later identification and verification at the Perth herbarium.

Vegetation structure was recorded according to the Muir classification (Appendix 2). Boundaries of different vegetation structure/composition were marked as waypoints on the GPS (GDA94 datum). Nine plotless 10 m x 10 m quadrats, ie.relevés, had all perennial species recorded and a digital photo taken.

Vegetation condition was attributed to one of the five categories (Table 2), which has been modified from Kaesehagen 1994, Keighery 1994, Penn and Scott 1995.

The survey was carried out according to the Environmental Protection Authority's Guidance No.51 (EPA 2004). Scant attention was given to the cleared area, referred to here as the 'old school oval', and fenced communications tower, which total approximately 3.5 ha within the reserve.

Table 2: Vegetation Condition Scale

Condition	Description
Excellent	Healthy undisturbed native vegetation with structure intact. No or minimal signs of site disturbance Virtually no weeds.
Very Good	Vegetation structure intact. Signs of minor disturbance. Some weeds present (<20% cover).
Good	Basic vegetation structure retained or ability to regenerate it. Signs of localised disturbance. Weeds present (20-40% cover).
Poor	Basic vegetation structure present, scope for regeneration but not to a state approaching good condition without intensive management. Severely impacted by disturbance. Weeds (40-80% cover).
Very Poor	Vegetation structure disappeared; area almost completely without native species; either bare ground or introduced ground cover predominates (eg pastures, forestry, parkland clearing). Disturbance incidence very high. Overrun by weeds (>80% cover).

Waypoints were downloaded and overlayed on a digital, orthocorrected, aerial photo of the reserve using OziExplorer ® software.

Identification of plant specimens were confirmed at the Department of Environment and Conservation's (DEC) Perth Herbarium. Taxonomy follows the DEC's Florabase. Voucher specimens of Priority flora and those of interest will be lodged in that herbarium.

Results

Flora

A total of 133 native species were recorded, excluding the eucalypt plantings within and adjacent to the reserve. The most represented families were Myrtaceae (24 taxa), Proteaceae (23), Fabaceae (18) and Cyperaceae (15). Generally, the sedges and rushes were a significant component of the flora, with a total of 26 species recorded. A full species list is provided in Appendix 3.

Declared Rare and Priority Flora

No Declared Rare Flora was found. One Priority Two species, *Chordifex ornatus,* was found at a number of locations on Reserve 31611 (Fig. 2). A collection (GFC8762) was made north-east of the tower beneath *Phymatocarpus maxwellii* and thereafter noted where it occurred in relevés (B5 and B6) (Appendix 4 & 5). It may be more widespread in the reserve, as it was not until it was confirmed in the Perth herbarium, after the field trip, that the significance of this plant was recognized. This rush is distinguished from the more common *C. laxus* by having prominent tufts of hairs on the culm sheaths.

Chordifex ornatus has not been previously collected from the Bremer Bay area and is known mainly from localized sites at Tambellup and South Stirling (Meney and Pate 1999). This is a significant extension of its known distribution.

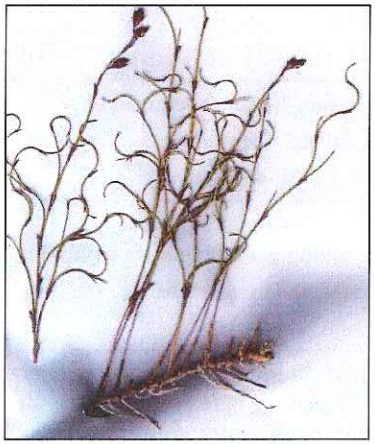

Plate 1 – *Chordifex ornatus* (GFC8762)

Figure 2 - Location of *Chordifex ornatus* on Reserve 31611

Vegetation Units

The vegetation map at 1:2000 scale (Fig. 3) largely reflects changes in vegetation structure. The most common structure was a Very Open Mallee, Heath (0.2 - 2 m tall) and Sedge community characterized by *Eucalyptus pleurocarpa* [**Eple**]. Patches of tall mallee *Eucalyptus decipiens* subsp. *adesmophloia* [**Edec**] occur over the northern 2/3 of the reserve, while the south-east sector had a relatively large strip of dense tall mallee characterized by *Eucalyptus angulosa* [**Eang**]. Thickets of *Phymatocarpus maxwelli* [**Pmax**] are found in the northern sector and extend beyond the northern boundary of the reserve through the School Reserve 26382 to Mary Road. Relevé data and photographs are provided in Appendix 5.

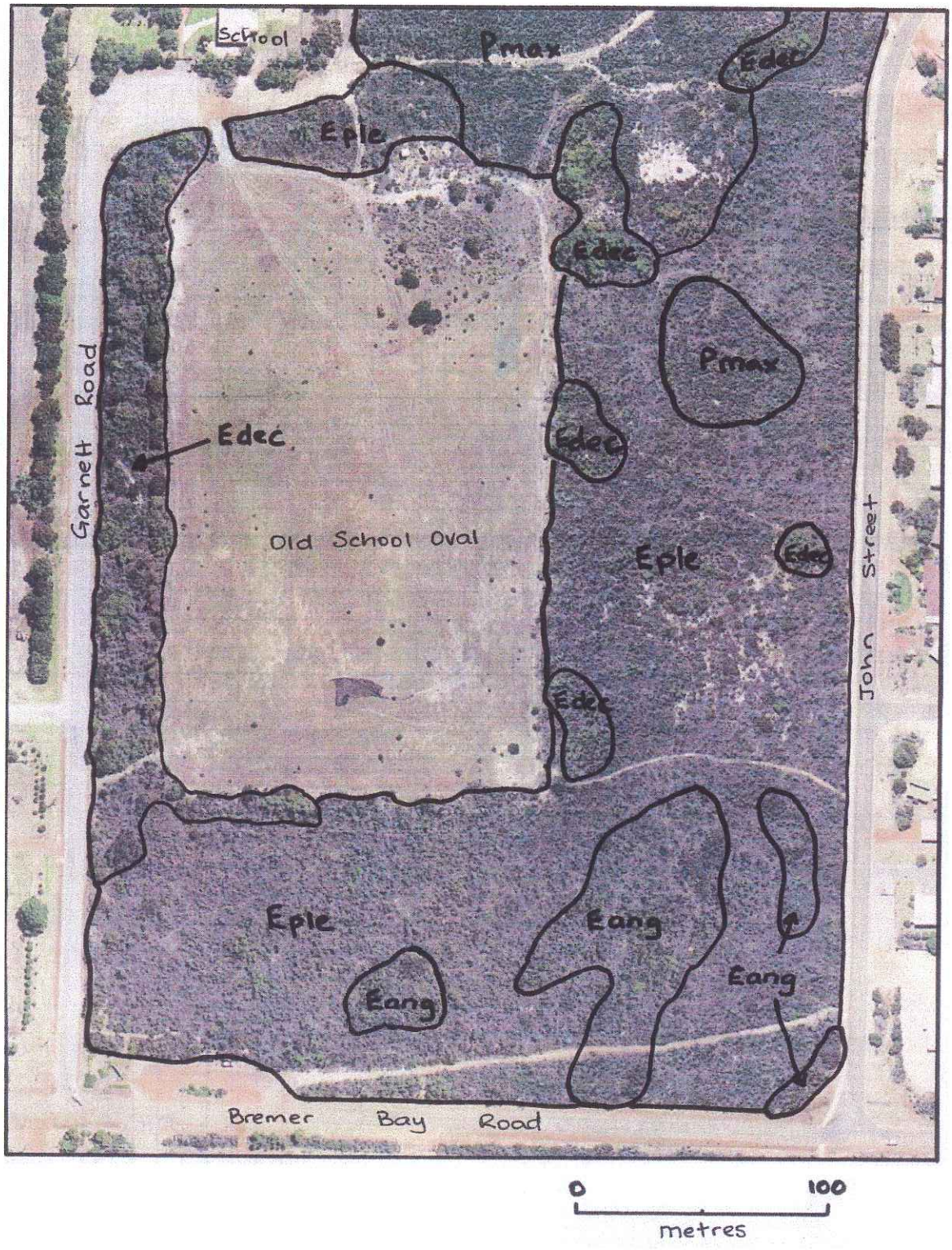

Figure 3 - Vegetation units on Reserve 31611, Bremer Bay

The species composition most closely resembled Newbey's (1979) "Spongolite Tall Open Shrubland" [S] plant association (see Land Assessment 2009 – Appendix B) with 15 species typical of that unit being recorded. In comparison, only seven species of Newbey's "*Eucalyptus pleurocarpa* Tall Open Shrubland" [Eple] were found (Appendix 3).

None of these vegetation types are listed as Threatened Ecological Communities.

Vegetation Condition

Exotic plants and pests

The presence of weeds or planted *Eucalyptus* species were the principal indicators of vegetation condition in this survey. The list given in Table 3 does not include pasture species that may have been planted on the 'old school oval'.

Figure 4 shows the location of the exotic species; note the highly invasive bridal creeper *Asparagus asparagoides* is present under a few mallees at the south end of the 'old school oval'. It appears that the Victorian tea tree *Leptospermum laevigatum* has been slashed on the oval, however many plants are still present here and along the 'Old Bremer Bay Road' that passes through the southern sector of the reserve.

There was evidence of rabbits. Kangaroos, although not considered a pest, were observed grazing on the 'old school oval' and many pads are present through the native vegetation.

Table 3. Exotic plants recorded on Reserve 31611

[#WON – Weed of National Significance; P1 – Noxious weed list of Western Australia]

	Species	Common Name
Category#	**Invasive weeds:**	
WON	**Asparagus asparagoides*	bridal creeper
	**Briza maxima*	blowfly grass
	**Disa bracteata*	South African orchid
	**Ehrharta calycina*	perennial veldtgrass
	**Ehrharta longiflora*	annual veldtgrass
P1	**Eragrostis curvula*	African lovegrass
	**Leptospermum laevigatum*	Victorian tea tree
	**Pennisetum clandestinum*	kikuyu
	Planted species:	
	Eucalyptus calophylla	marri
	Eucalyptus conferruminata	Bald Island marlock
	Eucalyptus leucoxylon	white ironbark
	Eucalyptus macrandra	river yate
	Eucalyptus spathulata	swamp mallet
	Eucalyptus stoatei	scarlet pear gum
	Eucalyptus utilis	coastal moort
	Hakea laurina	pincushion hakea
	Melaleuca nesophila	mindiyed
	Melaleuca armillaris	