



# "WESTERN TRIANGLE" DEVELOPMENT PLAN

Prepared on behalf of,  
and with input from

ROEBUCK ESTATE DEVELOPMENT PTY LTD

For Submission to  
SHIRE OF BROOME

Revision 1  
October 2009



■ Land Use

■ Design

■ Strategy

■ Economics

■ Research

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"WESTERN TRIANGLE" DEVELOPMENT PLAN

# PART 1 - STATUTORY PROVISIONS

October 2009

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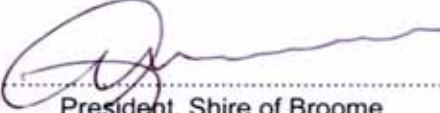
## ADOPTION OF DEVELOPMENT PLAN


THE WESTERN TRIANGLE DEVELOPMENT PLAN  
WAS ADOPTED BY  
RESOLUTION OF THE SHIRE OF BROOME ON

15 APRIL 2010 Date

AND THE SEAL OF THE MUNICIPALITY WAS PURSUANT  
TO THE COUNCIL'S RESOLUTION HEREUNTO AFFIXED IN THE  
PRESENCE OF:



  
President, Shire of Broome

  
Chief Executive Officer, Shire of Broome

24/2010 Date

AND ADOPTED BY  
RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON

18 FEB 2011 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 57 of the Western Australian Planning Commission Act 1985 for that purpose, in the presence of:

M. Wieclaw Witness

18 FEB 2011 Date

DATE OF EXPIRY: 19 OCTOBER 2035



# 1. STATUTORY PROVISIONS

## 1.1. Citation

This "Western Triangle" Development Plan (WTDP) has been prepared in accordance with Clause 4.25.3 of Shire of Broome Town Planning Scheme No. 4 ("the Scheme") and comes into operation upon adoption by the Western Australian Planning Commission pursuant to sub-clause 4.25.3.5 (b) of the Scheme.

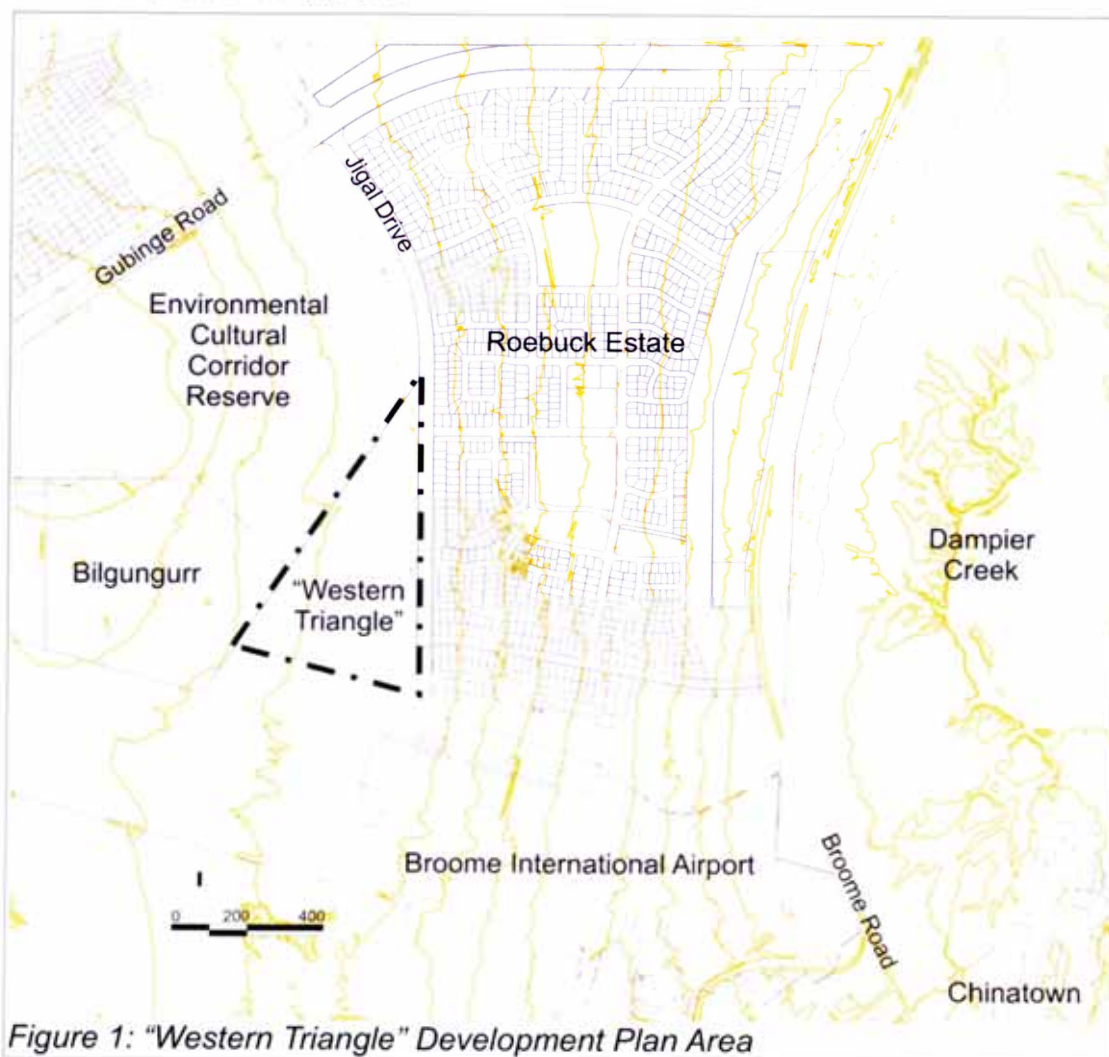
## 1.2. Components

The WTDP is in two parts:

- Part 1. Statutory Provisions;
- Part 2. Explanatory Report.

## 1.3. Development Plan Area

The WTDP shall apply to the land contained within the inner edge of the broken black line as depicted in Figure 1.



## 1.4. Land Title and Area

The land comprising the Development Plan Area is as described in Table 1.

| Description                 | Certificate<br>of Title<br>Vol / Folio | Land Area  |
|-----------------------------|--|------------|
| Lot 9039 on Plan 62492      | 2716 / 987                             | 0.7821 ha  |
| Lot 9038 on Plan 59296      | 2705 / 793                             | 16.0600 ha |
| Part Lot 1653 on Plan 23563 | 2189 / 749                             | 2.8436 ha  |

*Table 1: Land Title Details*

## 1.5. Interpretations

The words and expressions used in the WTDP shall have the same meanings as given to them in the Scheme.

## 1.6. Relationship with the Scheme

In the event of there being any inconsistencies or conflicts between the provisions, standards or requirements of the Scheme and the provisions, standards or requirements of the WTDP, then the provisions, standards or requirements of the WTDP shall prevail.

## 1.7. Objective

The objective of the WTDP is to facilitate the subdivision and development of the Development Plan Area generally in accordance with the physical plan presented as Figure A. Variations to the land use proposals illustrated in Figure A may be permitted, subject to the provisions of Clause 4.25.3.7 of the Scheme.

## 1.8. Land Use

The land uses permitted within the Development Plan area are:

- Residential development at the density codes indicated in Figure A.
- Public Open Space.
- Roads and paths.

Development of these land uses shall be in accordance with the provisions applying to the nearest equivalent zones and reserves under the Scheme.





"WESTERN TRIANGLE" DEVELOPMENT PLAN

# PART 2 - EXPLANATORY REPORT

Prepared on behalf of,  
and with input from

ROEBUCK ESTATE DEVELOPMENT PTY LTD

For Submission to

SHIRE OF BROOME

Revision 1  
October 2009

■ Land Use

■ Design

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- C: Transport Assessment by  
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- D Draft Restrictive Covenant intended for lots backing onto Bilgungurr.

# 1 INTRODUCTION

This is Part 2 of the "Western Triangle" Development Plan (WTDP) – the Explanatory Report. The purpose of this report is to provide:

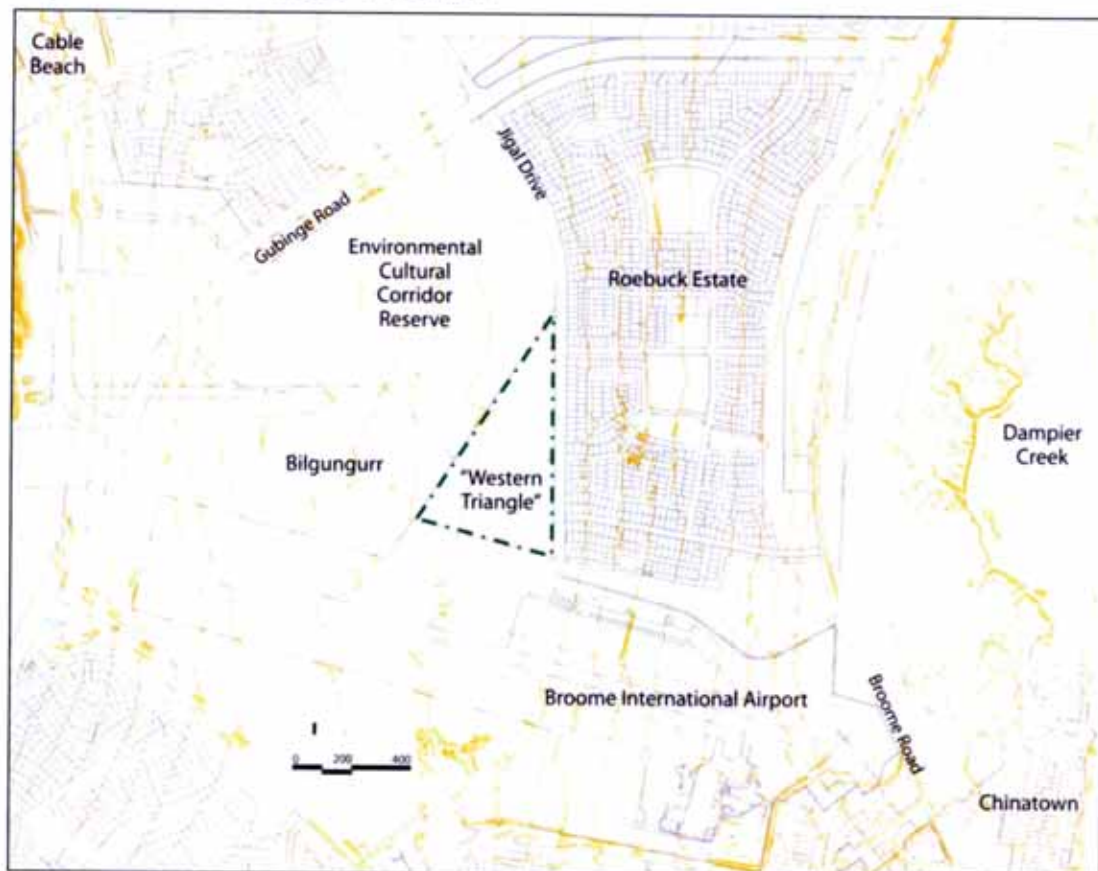
- A description of the land the subject of the development plan, and its context;
- The rationale for and details of the WTDP.

## 2 SUBJECT LAND

### 2.1 Location & Context

The subject land is a triangular shaped freehold parcel of some 19.7 hectares bounded by Jigal Drive to the east, Broome International Airport to the south and the Bilgungurr Aboriginal Community and land reserved for Environmental Cultural Corridor under TPS 4 to the west. Figure 1 shows the location of the subject land, which is referred to throughout this report as the "Western Triangle".

Figure 1 "Western Triangle": Location









larger development project. At the time, the whole of the area west of Jigal Drive (except Bilgungurr) was zoned "Development" in the Shire's town planning scheme. The current Environmental Cultural Corridor Reserve was not applied until later, and still applies in TPS No. 4.

The success of Roebuck Estate, the continuing expectations of substantial future demand for residential lots in Broome, and the reservation of adjacent land as Environmental Cultural Corridor (indicating the indeterminate nature of the development potential for the wider area) has prompted the production of this development plan, which will enable the Western Triangle to be developed in the short term. As this report will demonstrate, however, care has been taken to ensure that if urban development does eventually occur to the west of the triangle, it won't affect the integrity of the triangle precinct; nor will development of the triangle prejudice future development options in the wider area.

## 2.3 Access

Access is obtained from Jigal Drive, which currently defines the eastern boundary of the Western Triangle. A framework of major roads has been planned for Broome, with the major road system north of the airport currently comprising Broome and Gubinge Roads. Important secondary roads include Fairway Drive, Sanctuary Road and Cable Beach Road West. At present Jigal Drive forms an extension of Fairway Drive across Gubinge Road southwards to Sandpiper Avenue, which provides access to Broome Road.

The eventual relocation of the airport will enable Jigal Drive to be extended further southwards to connect with Port Drive, and Short Street to be extended from Chinatown westwards across Jigal Drive to link with Cable Beach Road West at Gubinge Road, in accordance with the LSP. At this time, the Western Triangle will be able to be extended further south to abut the new east west road. As explained later in this report the development plan allows for a straightforward southern expansion once the airport has been relocated.

In the meantime, however, the Western Triangle has been designed to function as a residential precinct in its own right for as long as the airport remains where it is.

## 2.4 Zoning

The land is zoned "Development" in the Shire of Broome Town Planning Scheme No. 4.

## 2.5 Ownership

The land is owned by Roebuck Estate Development Pty Ltd.



## 2.6 Existing Land Use

Most of the land is uncleared bushland which was originally part of the Broome airport and fenced accordingly. A communications tower supporting the Vodafone mobile telephone network exists in the middle of the development area. This tower is expected to be relocated during 2009.

Some of the land has become degraded and is being used as a dumping ground for car bodies and general household rubbish, particularly along the eastern boundary. There is also an element of anti-social behaviour as the area has been used as a circuit for trail bikes and off road vehicles. The land owners have taken action to minimise these activities.

## 2.7 Topography

The land is relatively elevated, being nearly RL17m near its western corner, with a gentle slope downwards towards the east. It is around RL15m along its Jigal Drive frontage.

## 2.8 Soil

The Western Triangle is situated within the Dampier Peninsula which is characterised by surface deposits of red, fine grained silty sand with variable silt content, poor in nutrients and known as "pindan". These deposits are underlain at variable depths by the Broome Sandstone.

## 2.9 Vegetation

The vegetation on the Western Triangle is Pindan Woodland, which is dominated by Pindan Wattle. A detailed assessment of the vegetation by Mr. Tim Willing is included as Appendix A to this report.

## 2.10 Aboriginal Heritage & Cultural Sites

The land upon which the proposed WTDP is situated is privately owned freehold land which has been part of the Broome International Airport (BIA) since the airport was first operational in the early 20<sup>th</sup> century. The land has previously been fenced for security reasons to prevent trespass by humans for the majority of this period. Some of the land has previously been used as a storage and lay down area for aviation-related activities.

The Commonwealth of Australia divested the airport land and operations to the current owners in 1991. The land proposed for the Western Triangle is now outside the current airport security boundary and has been subject to dumping of car bodies and associated anti-social behavior over recent years. This has been an ongoing management issue for BIA.



Since 1991 there have been numerous correspondence and discussions with Rubibi and the Kimberley Lands Council in regard to aboriginal heritage and cultural issues that may affect potential development of land within the boundary of the airport. BIA (formally Airport Engineering Services – AES) understands that from these discussions and subsequent joint site inspections with traditional owners of all land owned by BIA north of the runway, there were no areas of aboriginal heritage that would be of concern if development proceeded.

A search of the electronic portion of the *Register of Aboriginal Sites* (established and maintained under the *Aboriginal Heritage Act 1972*) has been undertaken, the results of which are attached as part of Appendix B.

## 3 PLANNING CONTEXT

### 3.1 Report of the Broome Planning Steering Committee

Figure 1a in the Report of the Broome Planning Steering Committee, titled "Future Land Use Framework and Planning Strategies: Broome Townsite" shows the northern portion of the subject land, as "future housing area", and the southern portion as "future Aboriginal needs housing". Figure 1a also shows the southern portion of the subject land being traversed by a "major road-future", and a linear park adjacent to the future road.

Since the Report of the Broome Planning Steering Committee was produced, a review of the requirement for the future major road depicted in Figure 1a came to the conclusion that it was not going to be required. Accordingly, it does not form part of this development plan.

Figure 1a depicts an extensive area of Aboriginal needs housing on the western side of Jigal Drive, most of which is Crown land falling within the Environmental Cultural Corridor Reserve. The section to the immediate west of Bilgungurr appears to have been mistakenly located on private (airport) land located within the Development zone under TPS 4. It is therefore intended to develop this land for normal urban purposes, even though the bulk of it falls within a portion that will not be able to be developed until after the airport relocates.

The Report of the Broome Planning Steering Committee clearly indicates that opportunities to increase residential densities in new urban areas should not be ignored. Some relevant extracts from the section of the Report titled "Housing and Residential Land" are included in the following paragraphs:

*"Broome has one of the highest median house prices outside inner metropolitan Perth. This is affecting the community's access to housing, both as purchasers and as renters. Correspondingly, the Department of Housing and Works is finding it difficult to meet the growing demand for public housing.*

*High housing costs are attributed to high building and construction costs; the need to meet climatic conditions; a small amount of available land relative to growing demand; fewer consumer choices; and ongoing developer uncertainty over the resolution of native title. With further limitations on land availability together with continued population growth, land and housing costs can be expected to remain high in the medium term. High housing and rental costs are affecting a number of sectors of the community including lower income earners, young adults wishing to stay in the community and employers seeking to attract and retain employees....*

*...Constraints on land release, the most significant of which is native title, are limiting the ability to provide for demand... Strategies to accommodate demand will be based on the identification of appropriate alternative land release areas, and potentially, a review of densities in existing areas."*



It is clear from these words that appropriate increases in residential densities within existing areas were seen by the Broome Planning Steering Committee as one means of addressing issues of housing demand and affordability in Broome. For this reason, the WTDP proposes higher overall residential densities than were provided in Roebuck Estate.

### 3.2 Broome Local Planning Strategy

The purpose of the Local Planning Strategy is to provide a rationale for the zonings, reserves and provisions of the town planning scheme. For the purposes of this report the most relevant stated "Aims of the Scheme" include the following:

- To ensure there is sufficient supply of serviced and suitable land for housing, employment, commercial activities, community activities, recreation and open space.
- To provide for housing choice and variety in neighborhoods with a community identity and high levels of amenity.

The proposed development plan will help implement both of these aims. The development plan will result in an increased supply in the number of dwelling units in Broome, and provide greater housing variety and choice.

### 3.3 Broome Local Housing Strategy

The Shire of Broome has recently released a new Local Housing Strategy, which is underpinned by the following fundamental principles:

- Affordability;
- Diversity;
- Sustainability; and
- Heritage/ Character.

The strategy also lists the following objectives, together with a range of delivery actions aimed at achieving each of them:

1. Provide for additional residential land in appropriate locations;
2. Provide for a diverse range of housing types;
3. Provide for a diverse residential population;
4. Ensure there is an adequate provision of community facilities and open space;
5. Protect residential land from non-residential uses;



6. Provide for the development of environmentally and climatically responsive dwellings;
7. Protect the character of Old Broome (East of Herbert Street);
8. Provide for affordable, low cost temporary employee accommodation.

It is clear that the WTDP is not only in alignment with the principles and objectives of the Local Housing Strategy, but positively contributes to the realization of many of the stated objectives. In relation to the first of these objectives, the short term supply of residential lots is of particular concern:

*"Preliminary forecasts (based on forecast population growth) indicate that at least 1,090 new residential lots will be needed between 2007 and 2011, in addition to the current LandCorp releases. This estimate does not allow for any additional demand, should one or more of the proposed major resource projects in the area receive the go-ahead.*

*Implications:*

*DPI's draft land release plan indicates that approximately 505 residential lots will be released between 2007 and 2011. This will result in an estimated shortfall in demand of at least 500 lots if planning for additional releases cannot be progressed during this period."* (Local Housing Strategy; Page 35).

Subject to the approval of this WTDP, the conveniently located residential land in the Western Triangle could potentially be developed and made available within the short to medium term, thus helping to satisfy the identified demand.

### 3.4 Broome Commercial Strategy

A review of the Broome Local Commercial Strategy carried out in 2007, amongst other things defined a three-tier centres hierarchy for Broome, namely:

- Chinatown/ Town Centre;
- Broome Boulevard;
- Local (village) centres.

Roebuck Estate contains a local (village) centre at the corner of Sanderling Drive and Spoonbill Avenue. The commercial strategy review recommended encouraging improvements to various local centres, including that in Roebuck Estate.

The WTDP will result in more dwelling units being constructed within the primary trade areas of Chinatown and (for local convenience shopping) the Roebuck Estate village centre. This will help support the local village centre, thus potentially encouraging its improvement. The number of residential units proposed in the Western Triangle is insufficient to support an additional local centre within the triangle itself. When the airport relocates and Jigal Drive is

extended southwards, the population of the Western Triangle will also have easy access to the Broome Boulevard shopping centre.

## 3.5 Strategies/ Policies

The only State Planning Policies considered relevant in respect of the proposed development plan are:

- SPP No. 3.1 Residential Design Codes (Variation 1);
- SPP No. 3 Urban Growth and Settlement; and
- Liveable Neighbourhoods.

### 3.5.1 Residential Design Codes

The new Residential Design Codes (Variation 1) publication is self-explanatory. Development on the subject land will need to be in accordance with the RCodes and any permitted variations. The proposed RCodes are described later in this report.

### 3.5.2 Urban Growth and Settlement Policy

The overall aim of the high-level Urban Growth and Settlement Policy, which applies throughout Western Australia is:

*"... to facilitate sustainable patterns of urban growth and settlement by setting out the requirements of sustainable settlements and communities and the broad policy in accommodating growth and change."*

The objectives of the policy may be summarised as follows:

- To promote a sustainable and well planned settlement pattern, with sufficient and suitable land to provide for a wide variety of housing.
- To build on existing communities with established local and regional economies, and enhance the quality of life in those communities.
- To manage the growth and development of urban areas in response to the social and economic needs of the community.
- To promote the development of a sustainable and liveable neighbourhood form which reduces energy, water and travel demand, provides choice and affordability of housing.
- To coordinate new development with the efficient, economic and timely provision of infrastructure and services.

Implementation of the policy is intended to occur through, amongst other things, local planning schemes. The development plan will contribute to the



implementation of the Urban Growth and Settlement Policy by increasing housing supply and variety in response to social and economic needs.

### **3.5.3 Liveable Neighbourhoods**

This "operational" policy intends that neighbourhoods should be the basic building blocks for urban development. New urban areas are to be comprehensively planned as sustainable communities within easy walking or cycling reach of services and employment. The policy recommends inclusion of a variety of lot sizes and housing types within neighbourhoods to cater for the diverse housing needs of the community at a density that can ultimately support the provision of local services.

Implementation of the policy is intended to be facilitated through district and larger-sized structure plans, local structure plans and subdivisions. Although there are several site constraints limiting the potential for a pure interpretation of Liveable Neighbourhoods, the WTDP will nevertheless contribute to the implementation of this policy by facilitating subdivision and development of conveniently located and accessible residential land in Broome. Accessibility and related Liveable Neighbourhoods criteria are illustrated and discussed in the next main section of this report.

## **3.6 Council Policy**

A review of the current Council policies listed on its website indicates that the only policy of any potential relevance to the proposed amendment is Policy No. 4.1.17 Titled "Residential Design Codes 2002 – Regional Exceptions". Any development following approval of the development plan would need to have regard to this policy.

## **3.7 Consultation**

It is recognised that, under TPS 4, once the Council is satisfied with the WTDP it will need to be advertised for public comment, prior to finalisation and subsequent adoption by the WAPC. At various times during preparation of the WTDP, it was discussed with Council officers. It is considered that the plan now generally accords with Council officer's requirements and expectations.

The Bilgungurr Aboriginal Corporation's (BAC) community abuts the lower third of the western side of the WTDP. There are potentially ten residential lots that are proposed along the WTDP/BAC interface boundary.

The BAC, through State and Shire planning processes and earlier meetings with representatives of Broome International Airport (BIA), has been aware of potential development on the Western Triangle for some time. BIA and BAC met to discuss the project over two years ago and more recently a meeting was held with the Chairman of BAC, Mr Michael Torres to discuss BAC/WTDP interface issues.



It is understood that the BAC had a preference for an unfenced "Cultural Corridor" as the buffer between BAC and the WTDP. However, it is recognized that a strip of public land, either designated as a "Cultural Corridor" or Public Open Space could promote a continuation of the anti-social behavior that has occurred in the past to the rear of the BAC boundary and compromise the security and amenity of existing BAC and future WTDP residents.

Both BAC and BIA recognize the need for a buffer to limit noise and provide separation so that any compromise on amenity of both the BAC and the future residents of the Western Triangle is minimized.

It is proposed that there would be a 6 metre deep landscaped buffer within and at the rear of the lots abutting BAC, in addition to the normal building setback requirements. There would also be an appropriate fence along the full length of the common boundary intended to maximize privacy and limit noise. Copies of these proposals, which are discussed in detail in the next section of this report, have been forwarded to the BAC for further consideration in advance of the public advertising period for the WTDP.

### **3.8 Conclusion**

The review of the planning context summarised in this section of the report clearly indicates that the proposed development plan, which will be described in the following report section, is either consistent with or positively supports all relevant current or draft State or Council planning strategies and policies.

## 4 DEVELOPMENT PLAN

The Western Triangle development plan is illustrated in Figure A. The relevant land use statistics are summarised in Table 1.

Table 1 Proposed Land Use

| Land Use               | Total<br>Area (ha) | Prop.<br>Dev. Area | No.<br>Lots             | Avg<br>Lot Area | Units@<br>(R40)** | Units@<br>(R50)** |
|------------------------|--------------------|--------------------|-------------------------|-----------------|-------------------|-------------------|
| Residential            |                    |                    |                         |                 |                   |                   |
| R15                    | 6.0643             | 30.8%              | 88                      | 689             | 88                | 88                |
| R20                    | 3.7304             | 20.1%              | 68                      | 549             | 68                | 68                |
| R30                    | 0.8630             | 4.7%               | 12                      | 719             | 24                | 24                |
| R40/ R50 **            | 1.7751             | 9.6%               | 6                       | 2,959           | 77                | 95                |
| Total Residential      | 12.4328            | 67.1%              | 174                     | -na-            | 257               | 275               |
| Public Open Space      | 1.3780             | 7.4%               | (7% of Total WTDP Area) |                 |                   |                   |
| Internal Roads         | 4.7134             | 25.4%              |                         |                 |                   |                   |
| Total Development Area | 18.5242            | 100%               |                         |                 |                   |                   |
| No Development***      | 1.1615             | -na-               |                         |                 |                   |                   |
| Total Western Triangle | 19.6857            | -na-               |                         |                 |                   |                   |

\*\*\* Area that will not be developed until after the airport has been relocated

### 4.1 Principles & Concept

As mentioned earlier, when the alignment of Jigal Drive was determined as part of the original Airport Area LSP, it was confidently anticipated that most of the area west of Jigal Drive (i.e. excluding Bilgungurr) would soon be planned and developed as a residential neighbourhood in a similar manner to Roebuck Estate. This did not eventuate, and most of the available land has since been reserved as an environmental cultural corridor in the town planning scheme. Whilst it still has sound development potential, and the current reserve could in the future be changed to facilitate development, there is at present no way of knowing if or when this might occur.

However, development of the privately owned Western Triangle offers timely production of residential lots pending leisurely resolution of the future of the balance of the entire area west of Jigal Drive. Conveniently located new residential land will be needed in Broome and the Western Triangle can be developed by straightforward connection with the urban infrastructure that has been established as part of the Roebuck Estate development. For all practical purposes, the Western Triangle is an extension of Roebuck Estate, as illustrated in Figure 3.







Figure 3 "Western Triangle" Relationship with Roebuck Estate

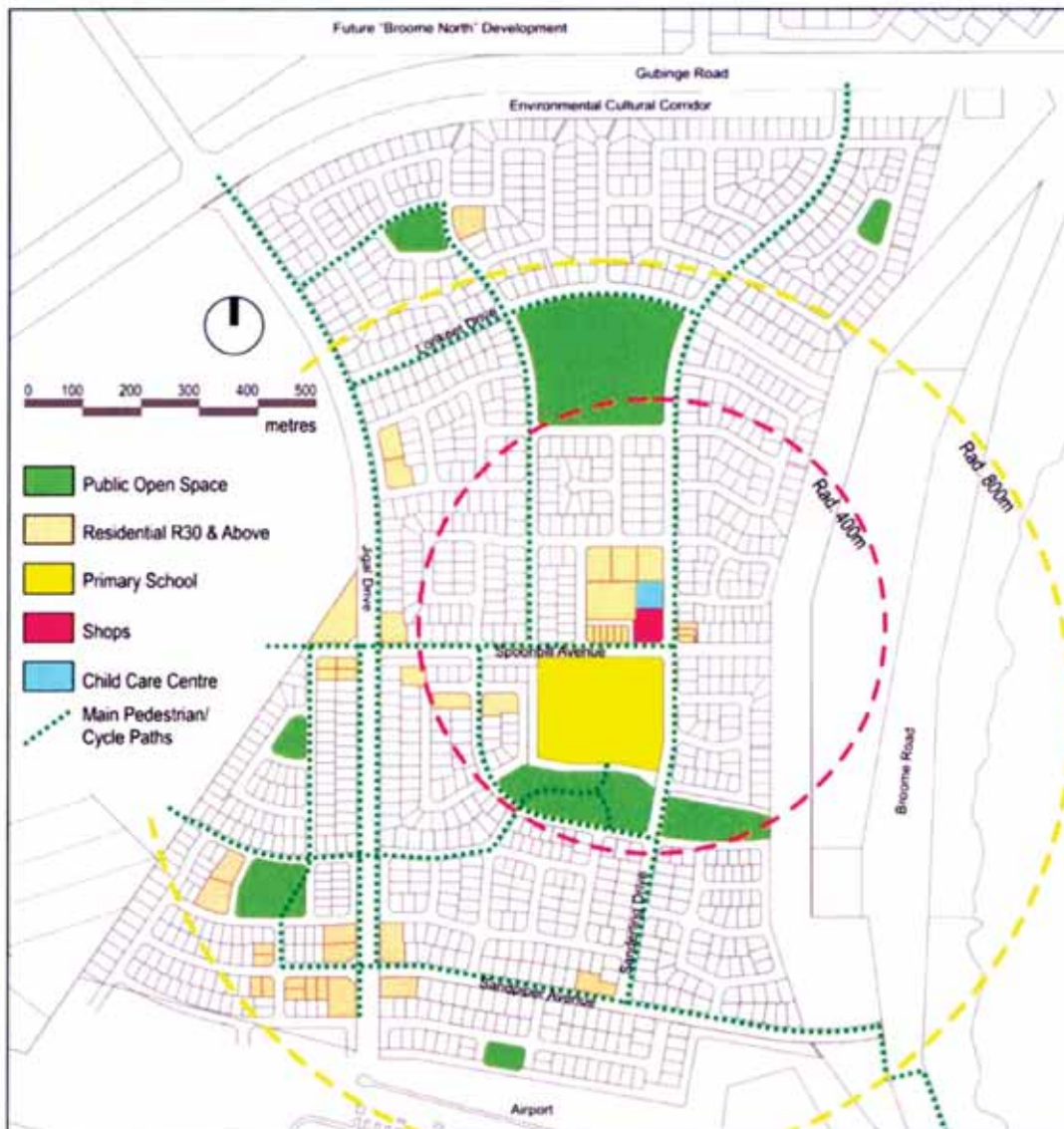


Figure 3 shows a 400 metre radius around the local shops in Roebuck Estate, and an 800 radius around the school. It also shows how the main pedestrian/ cycle path system connects with that in Roebuck Estate to provide good accessibility to both shops and school. It can be seen from Figure 3 that households in the Western Triangle will have pedestrian/ cycle access to the school and shops which is, on the whole, superior to that in the northern part of Roebuck Estate. Access to public open space is also of a very high standard, with every residential lot in Roebuck Estate and the Western Triangle being well within 400 metres of a park. (This point has not been specifically illustrated in Figure 3 as it can easily be perceived by perusal of the map.)



### 4.1.1 Objectives

In recognition of its context, the following objectives for development of the Western Triangle have been established:

- The creation of a separate residential precinct as an extension of Roebuck Estate, albeit with a higher overall residential density;
- Ensure that development of the adjacent environmental cultural corridor, if it occurs, will not adversely impact upon the character and amenity of the precinct. (The precinct may well have been established for many years before adjacent development occurs).
- Conversely, ensure that any development of the environmental cultural corridor is not prejudiced by development within the Western Triangle.
- Ensure that development of the airport land to the south, when it occurs, will not adversely impact upon the character and amenity of the precinct.
- Conversely, ensure that any development of the airport land to the south is not prejudiced by development within the Western Triangle.
- Provide a practical, manageable "buffer" between the residential development in the Western Triangle and Bilgungurr.

It is considered that the WTDP (see Figure A) satisfactorily addresses these objectives. Features of the development plan, and the Western Triangle's relationship with the rest of Roebuck Estate, are discussed in the following sections.

## 4.2 Road Layout

The main entry points into the Western Triangle precinct are via extensions of Spoonbill Avenue to the north, and Sandpiper Avenue to the south. The Spoonbill Avenue entry point has been designed to facilitate direct connection with future development to the west, should this be required in the future. Spoonbill Avenue provides access to both the primary school and shops in Roebuck Estate. Both main entry roads have reserve widths of 25 metres, the same width as the roads from which they extend. *(at Sandpiper Ave - reserve ↓ to 18m (12))*

The majority of internal roads have reserve widths of 18 metres. Some narrower road reserves (16 metres) are provided over short lengths, and where one side of the road forms a common boundary with public open space.

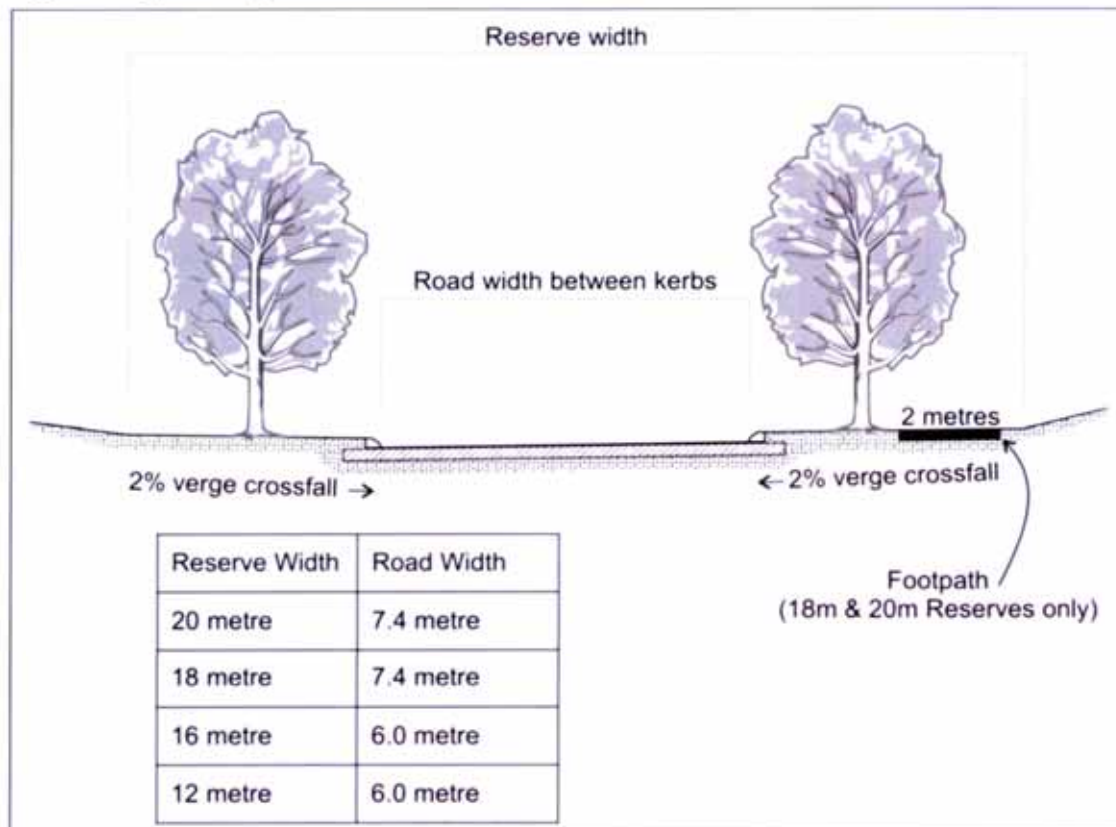
There are two instances where the planned road reserve is reduced to a width of 12 metres:

1. On the western side of the main public open space, where two group housing sites are proposed;

2. Along a short length where the access road serving six small lots shares a common boundary with Jigal Drive.

In both these cases, a reserve width of 12 metres is considered to be all that is required to provide vehicular access to the lots and facilitate the provision of utility services, without compromising future residential amenity. A typical cross section of the proposed roads is illustrated in Figure 4.

**Figure 4 Typical Superelevated Road Cross Section**



Source: Roebuck Estate Development Pty Ltd; Shire of Broome.

It is envisaged that some marked parking bays will be provided in the road reserves adjacent to open space, and that visitors to individual residences will park on the road at or near their destination in the usual manner.

### 4.3 Transport Assessment

In order to ensure that the additional traffic generated by the proposed development plan was consistent with assumptions made during recent traffic studies carried out as part of the Airport Development Plan, a study was undertaken by Uloth & Associates, which is included as Appendix C. The overall conclusions and recommendations of the transport assessment are as follows:



- The road network and road reserves within the proposed development plan are acceptable and provide good connectivity, permeability and efficiency for vehicles as well as pedestrians and cyclists.
- It is recommended that footpaths be provided on all streets within the development plan area in accordance with the advice given in Liveable Neighbourhoods, in addition to the proposed paths already indicated in the development plan.
- It is also recommended that an additional footpath should be provided along the western side of Jigal Drive for the entire length of the Development Plan area. (This recommendation has been diagrammatically incorporated into Figure A.)
- It is recommended that suitable pedestrian crossing treatments should be provided at the three crossing locations proposed along Jigal Drive, connecting pedestrian routes from the Development Plan area with the existing and proposed paths along Jigal Drive and within Roebuck Estate. It is therefore suggested that a pedestrian refuge island will be required within Jigal Drive at the proposed crossing near Bandicoot Loop. (This recommendation has been diagrammatically incorporated into Figure A.)
- It is also recommended that provision should be made for a possible future bus stop on Jigal Drive close to the proposed pedestrian crossing near Bandicoot Loop. (This recommendation has been diagrammatically incorporated into Figure A.)

## 4.4 Housing

The WTDP offers a good mixture of single residential lot sizes and Multiple Dwelling Sites enabling a diverse range of housing types to be constructed compliant with existing Roebuck Estate restrictive covenants, which will reflect and maintain the Broome style architecture promoted within Roebuck Estate.

As indicated in Table 1 on page 12, it is proposed to provide for a total of between 257 and 275 residential units. The development plan shows 88 single residential lots at R15 and 68 single residential lots at R20. Fourteen R15 lots of at least 700 sqm are proposed to have direct frontage to Jigal Drive, in a similar manner to what has been implemented directly opposite them in Roebuck Estate.

The R20 lots are mainly concentrated in the southern portion of the precinct, in the vicinity of the main public open space and southern entry from Sandpiper Avenue. These lots not only have good access to the main open space, but are also well placed in terms of fairly direct pedestrian access to the school and shops through Roebuck Estate.

A total of six group/ multiple dwelling sites are proposed, all but one of which is located in the southern portion of the precinct. It is intended to code these as R50, but for the purposes of estimating potential unit yields, it is assumed

that the actual yield on these parcels will be somewhere between R40 and R50.

#### ***4.4.1 Affordable Housing***

A total of twelve R30 lots are provided in pairs – four pairs in the south and two in the north – in order to facilitate development of a specific residential concept whereby a group of four dwelling units are developed on each pair of lots in a manner that enables each unit to commence with a first stage that can be added to later. This “grow house” concept can thus facilitate an affordable housing option for first home buyers. The significant number of relatively small single residential lots proposed in the Western Triangle will also contribute to housing affordability.

In addition, there will be an opportunity for the Department of Works and relevant not-for-profit organisations to purchase lots within the Western Triangle. This opportunity will be the practical means by which the Department and the not for profit organisations can implement the guidelines for affordable housing specified in the 2009 Local Housing Strategy.

#### ***4.4.2 Large lots Abutting Bilgungurr***

The ten R15 lots backing onto Bilgungurr are deliberately relatively large, all exceeding 900 sqm. This is part of the strategy of providing a “buffer” between Bilgungurr and the Western Triangle development. With the 6 metre front setback facilitated by the R15 coding, these lots will have greater than normal depth to the back yards. It is proposed to use this additional depth as a buffer under the private management of each home owner, rather than provide a public buffer comprising some form of public open space or cultural corridor. It is considered that such a public buffer would, over time, become just an untended wasteland and facilitate a continuation of the anti-social activity which currently occurs.

As an alternative, it is proposed that all lots abutting Bilgungurr will have Restrictive Covenants placed on their titles requiring that no structures of any kind will be permitted within six metres of the common rear boundary of the lots; and that the six metres will be appropriately maintained as heavy landscaping. A draft Restrictive Covenant indicating the nature of what is proposed is presented in Appendix D. This will be finalised in consultation with the Shire prior to any subdivision of the affected lots.

It is intended that the 6 metre rear setback required under the R15 Code will apply from the boundary of the landscape strip, and not the rear boundary of the actual lot. Thus, for all practical purposes, house and garden in each of the affected lots will be developed as if the lot had a 34 metre depth, rather than the 40 metre depth that will actually exist. The concept is illustrated in Figure B.



# Bilgungurr

appropriate  
boundary fence

6m landscaped  
buffer

minimum 12m  
total rear  
setback

Street

The concept is to create large single residential lots (900 sqm) of considerable depth (40 metres) backing onto the shared Bilgungurr boundary.

There would be a dense landscaped buffer of 6 metres depth on each lot between the main backyard of the houses and the Bilgungurr boundary. No building of any kind would be permitted within the landscaped buffer, which would need to be maintained by each householder.

It is also intended that there will be a 6 metre rear setback between the houses and the landscaped buffer. Thus the total separation between houses and the Bilgungurr boundary will be 12 metres.

Not to Scale  
30 March 2009

Western Triangle: Proposed Treatment  
of Lots Sharing Bilgungurr Boundary

SHRAPNEL URBAN PLANNING

Figure B



In this manner it is proposed that a heavily landscaped buffer will be created, which will be under private ownership and maintenance. The total spatial separation between Bilgungurr boundary and main dwellings will be at least 12 metres. Garden sheds and similar structures would be permitted between the rear of the dwelling and the boundary of the landscaped strip, but not within the landscaped strip itself. Plant species suitable for the initial planting within the strip will be determined in consultation with the Shire, which favours maximum use of endemic species.

In the interests of privacy it is also envisaged that an appropriate fence will be constructed along the common boundary between Bilgungurr and the proposed residential lots intended to maximise privacy and limit noise. This could be specially engineered to provide visual and acoustic screening but still allow the passage of breezes.

There is currently only one residential dwelling within Bilgungurr with close proximity to the BAC/ WTDP boundary. This dwelling is shown in Figure B. It is therefore considered that the proposed treatment along the boundary will provide an adequate buffer between the Western Triangle and Bilgungurr.

## 4.5 Public Open Space

As indicated in the development plan, two areas of public open space are proposed – a large one of 1.0616 hectares in the southern portion, and a smaller one of 3,164 sqm to the north. The open space represents the main community focal points within the WTDP area itself, and has been distributed and designed to provide a high level of access and amenity within the precinct.

As indicated in Table 1, the public open space represents 7 percent of gross subdivisible area (being the entire Western Triangle area), rather than the 10 percent normally required by the WAPC when approving residential subdivisions. As was the case with the Roebuck Estate, it is proposed, with the support of the Shire of Broome, to seek a dispensation from the WAPC to provide 7 percent POS on the basis that the englobo land value of the shortfall to 10 percent will be invested in providing landscaping treatments to the POS areas.

Such an approach was supported by the Shire of Broome and accepted by the WAPC in the Roebuck Estate for the following reasons:

- Within the overall urban design of the area, the amount and distribution of open space was considered sufficient for the needs of the community;
- Given the high cost of watering and maintenance of public open space in the State's north-west, it was agreed that the trade-off between quantity and quality represented by the dispensation proposal provided a net benefit.



These reasons which applied to the Roebuck Estate apply equally to the Western Triangle, particularly as the Western Triangle will become, for all practical purposes, part of the Roebuck Estate. The design and implementation of landscaping projects carried out by the developer as a result of the public open space dispensation arrangements will occur in consultation with the Shire, which has already advised that it favours the use of endemic plants for this purpose to the maximum practicable extent.

## **4.6 Aboriginal Heritage**

In accordance with the comments in Section 2.10 on Page 4 of this report, no specific measures directly relating to Aboriginal heritage have been incorporated within the WTDP.

## **4.7 Commercial Development**

No commercial development is proposed within the WTDP because there will be insufficient households to support a local shop, and access to the local school and shop in Roebuck Estate on the eastern side of Jigal Drive is easily achieved by car, cycle, or on foot.

## **4.8 Pedestrian/ Cycle Routes**

Figure A shows the main pedestrian/ cycle system within the Western Triangle, and its relationship with connecting paths in the Roebuck Estate. It is envisaged that there will be a footpath constructed on at least one side of each road within the precinct with a reserve width of 18 metres or more; however, the paths diagrammatically illustrated in Figure A identify the most important paths in the system. Three main crossing points on Jigal Drive are proposed:

1. Spoonbill Avenue roundabout;
2. Sandpiper Avenue roundabout;
3. A median crossing opposite the northern section of Bandicoot Loop.

The Spoonbill and Sandpiper Avenue connections will facilitate convenient pedestrian/ cycle access to both these significant streets, with Spoonbill Avenue providing a direct connection to the school and shops in the Roebuck Estate. The Bandicoot Loop connection will also provide a convenient access to and from the school (see Figure 3 on Page 13).

## **4.9 Utility Services**

A summary of the proposed services for the subdivision of the Western Triangle, as investigated in consultation with Engineering Consultants KBR

Pty Ltd and RJ Menzies & Associates Pty Ltd, is provided in the following sub-sections.

#### **4.9.1 Water Supply**

All lots within the subdivision will be connected to the Water Corporation's water reticulation system. A water connection for the precinct already exists and was provided as part of the development of Roebuck Estate on the eastern side of Jigal Drive.

#### **4.9.2 Sewerage**

All lots within the subdivision will be connected to the Water Corporation's sewerage system. A gravity sewer connection for the precinct already exists and was provided as part of the development of Roebuck Estate on the eastern side of Jigal Drive.

#### **4.9.3 Electricity**

All development will be provided with reticulated underground power from Horizon Power's existing network. Underground high voltage cables will feed HV/LV transformers within the precinct from the existing underground high voltage line in Jigal Drive.

#### **4.9.4 Telecommunications**

The existing telecommunication network will need to be upgraded to accommodate the service through the Western Triangle precinct. Telstra has been advised of the proposed development in order for planning and installation of plant and equipment to be undertaken commensurate with the anticipated timing of development and release of lots.

#### **4.9.5 Gas**

There is currently no reticulated gas network throughout Broome. Bottled gas is available to individual dwellings. It is not expected that reticulated gas in Broome will be economically feasible in the foreseeable future.

### **4.10 Stormwater Management**

#### **4.10.1 Design Criteria**

It is proposed that the management of stormwater and design of stormwater infrastructure is to essentially comply with the intent and objectives of the *IPWEA Local Government Guidelines for Subdivisional Development 2009* and the draft *Shire of Broome Addendum (Revision 1 – 16<sup>th</sup> October 2009)*



which includes the Shire of Broome *Guidelines for the Design of Stormwater Drainage Systems (Engineering Services September 2009)*.

The following runoff coefficients have been used in the drainage design in accordance with the Shire of Broome's guidelines:

- Vegetated Areas     0.4     (pre-development)
- Residential Lots     0.7
- Road Reserve        0.9

It is proposed that stormwater flow will be conveyed initially within the road pavement to accommodate the 1:10 year storm event between kerbs and then below ground pipe drainage to take the excess flow. The opportunity for rear lot drainage to reduce earthworks will be investigated at detailed design stage.

#### **4.10.2        Catchments**

Overland stormwater drainage within the Western Triangle flows across contour, generally from west to east. A preliminary "Drainage Catchment Plan" has been prepared identifying two primary catchments, one to the north and one to the south with outlets into the existing open drainage network (Figure 5):

- **Northern Catchment "A"**: an area of approximately 6.8 ha with discharge to the existing culvert at the corner of Jigal Drive and Spoonbill Av.
- **Southern Catchment "B"**: an area of approximately 11.0 ha with discharge to the existing open drain, currently located through Broome International Airport land owned by Pearl Coast Properties Pty Ltd.

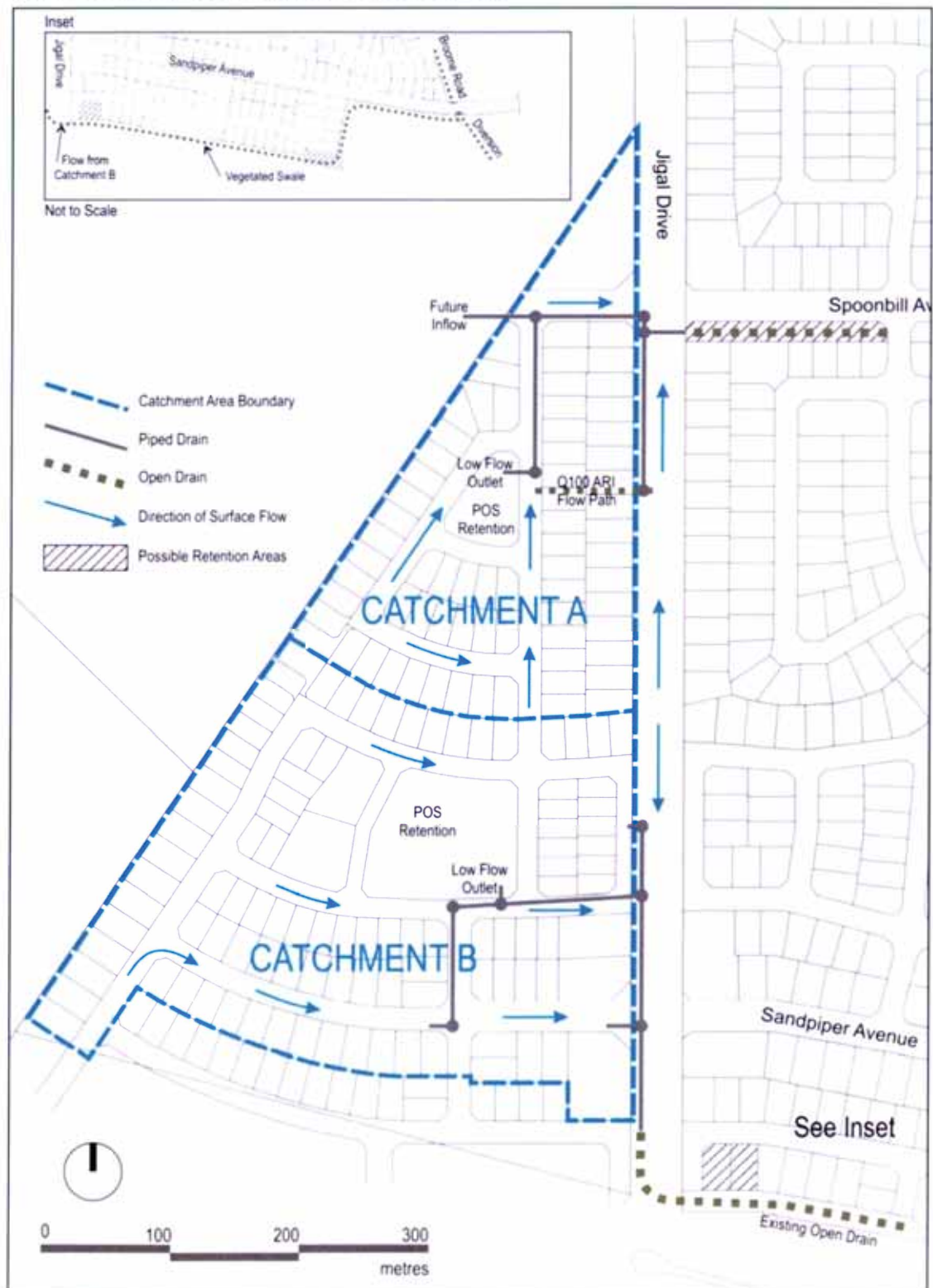
#### **4.10.3        Water Quantity**

The public open space areas within each catchment will be re-contoured and landscaped to act as multi-use basins to provide storage so that peak runoff outflows from each catchment will be no greater than those occurring under pre-development conditions. Preliminary calculations indicate that there is sufficient area within the public open space areas to retain the required stormwater volume without compromising the recreation function of the public open spaces.

Public open space will be grassed and serve a recreation as well as a drainage function. The grassed slopes of the public open spaces will generally not be steeper than 1 vertical to 10 horizontal, except in local areas to create barbeque and shade structure facilities. In order to reduce the risk of mosquito breeding and associated mosquito borne diseases, a concrete invert flow channel will be constructed across the public open spaces and connect to a

low flow pipe outlet, thus ensuring that standing water does not occur for prolonged periods.

**Figure 5 Preliminary Drainage Catchment Plan**





In order to reduce earthworks, retain natural vegetation and improve recreation areas within the public open spaces, the possibility of utilising surplus storage capacity in the open drains immediately on the eastern side of Jigal Drive will be investigated at detailed design stage as follows:

- Northern Catchment A: The construction of weirs with low flow outlets to provide storage along the length of the Spoonbill Avenue drain between Jigal Drive and the culvert at Sugar Glider Avenue. The opportunity will be taken to re-shape, where possible, and landscape this section of drain to soften the existing engineered drainage channel.
- Southern Catchment B: Provide additional storage capacity by expanding a local area of the drain immediately east of Jigal Drive creating a more traditional compensating basin remote from residential housing which could be incorporated into the ultimate drainage network.

#### **4.10.4 Water Quality**

The shape and limited size of the site makes it difficult to fully implement all of the provisions of the IPWEA and Shire of Broome Guidelines, particularly provisions relating to water quality. It is intended, however, to improve and augment downstream drainage, east of Jigal Drive for retention purposes thereby providing the opportunity to improve water quality by minimising velocities and erosion by aiding sedimentation.

The quality of stormwater originating from the larger Catchment B is proposed to be managed through the construction a vegetated swale drain within the existing open drain from Jigal Drive through to Broome Road. A drainage reserve width of up to 20 metres is proposed to allow flatter swale batters to provide a more natural waterway. Dry/ ephemeral detention basins using weirs and a low flow drain system would be constructed at opportune locations along the length of the swale to minimise velocities and erosion, aid sedimentation and the removal of gross pollutants.

The existing open drain serving Catchment B runs through Broome International Airport land owned by Pearl Coast Properties Pty Ltd. It is proposed to protect the area covered by the drain by an easement in favour of the Shire of Broome, or by a "private easement".

### **4.11 Environmental Protection**

#### **4.11.1 Hydrology, Surface Water & Drainage**

Drainage throughout Broome and in particular within Roebuck Estate and downstream of the Western Triangle consists of a combination of piped and open drainage conveying excessive stormwater runoff from impervious areas including roadways and buildings.



All excessive stormwater runoff on the east side of the Broome peninsula ultimately discharges into Dampier Creek via an open drainage system through culverts under Broome Road. Prior to discharge into Dampier Creek stormwater passes through a combination of low gradient swales and retention basins to control flow and minimise transportation of suspended solids.

#### **4.11.2 Hydrogeology**

The Western Triangle is situated within the townsite sub-area of the Broome Groundwater Area, which is proclaimed under the *Rights in Water and Irrigation Act 1914*. All groundwater in this area is subject to licensing and an application must be made to the Waters and Rivers Commission to take groundwater from this area.

The drilling of new bores and abstraction of groundwater is discouraged, as even low rates of abstraction in this sub-area can be expected to result in increases in groundwater salinity.

#### **4.11.3 Acid Sulphate Soils**

The Department of Environment and Conservation (DEC) describe Acid Sulphate Soils (ASS) as follows:

*"ASS are a natural component of the landscape and may be found in a variety of waterlogged soil types. These include:*

- *dark organic rich soils and muds*
- *peaty wetland soils*
- *some pale grey sands (Bassendean sands and Spearwood sands)*
- *'coffee rock' (cemented iron and/ or organic rich sands) found below the watertable.*

*ASS in Western Australia commonly occur in low lying wetlands, back-swamps, estuaries, salt marshes and tidal flats but are not constrained to coastal areas."*  
(Source DEC website)

To date there is no evidence of ASS in the WTDP area, which contains no waterlogged soil types and is elevated, being within the 15 to 17 metre contours (AHD). This is more elevated than all of the Roebuck Estate, during the development of which no evidence of ASS has materialised. For these reasons it is considered most unlikely that ASS occur in the WTDP area.

Notwithstanding the unlikelihood of ASS in the WTDP area, as a precaution, appropriate soil testing will be carried out prior to development. In the unlikely event that ASS are detected, appropriate management strategies will be prepared and implemented during the land development process.



#### **4.11.4 Flora & Fauna**

An assessment of flora and fauna within the WTDP area was undertaken by Tim Willing an ex long-term officer with CALM who has considerable experience with flora and fauna in the Kimberley. A copy of Mr Willing's report *Assessment of Flora and Fauna on 29HA of Bushland Northwest of Broome International Airport* is attached as Appendix A. In summary:

Flora - the Western Triangle is a single contiguous community of pindan woodland typical of vast inland areas of the southern Dampier Peninsula and is predominantly vegetated with native bushland. No species of flora of conservation significance were found to occur.

Fauna – the entire site is criss-crossed with a network of Agile Wallaby tracks and it is most likely, subject to appropriately managed clearing operations, that the population of Agile Wallabies would relocate themselves to adjoining bushland on Crown Land. All of the birds sighted are species common to the Broome area and the habitat and suburban setting makes it unlikely that any rare species are present.

#### **4.11.5 Airport Noise Intrusion**

The potential effects of noise due to the proximity of Broome International Airport have been considered. The applicable standard providing guidance on the siting and construction of buildings in the vicinity of airports to minimise aircraft noise intrusion is Australian Standard AS 2021-2000 "*Acoustics – Aircraft noise intrusion – Building siting and construction*".

The total area of the WTDP is outside the 20 Australian Noise Exposure Forecast (ANEF) zone for Broome International Airport (see Figure A following Page 12.) Therefore, pursuant to the provisions of AS 2021-2000, all building types are deemed "Acceptable" and there is usually no need for the building construction to provide protection specifically against aircraft noise.

The 20 ANEF is reasonably easy to define mainly because Broome International Airport has only a single runway and little variation in aircraft flight paths.

### **4.12 Staging of Development**

Development of the Western Triangle will commence at the Spoonbill Avenue and/ or Sandpiper Avenue extensions in order to simply and efficiently connect with the existing utility services in Roebuck Estate. Market demand will determine the size and timing of the individual development stages.