

An abstract graphic on the left side of the page consists of a network of interconnected nodes and lines. The nodes are represented by small circles in white, black, and brown, connected by thin grey lines. The network is denser on the left and tapers off towards the right. Two horizontal blue lines are positioned above the main title.

# **NORTH EAST BALDIVIS (MILLARS LANDING) STRUCTURE PLAN AMENDMENT 1**

## **PART ONE | IMPLEMENTATION**

July 2019

Title: North-East Baldivis (Millars Landing) Structure Plan  
Amendment 1  
Part One | Implementation

Prepared for: Cedar Woods Properties

CLE Reference: 3043Rep80A

Date: 17 July 2019

Status: Final

Review date: 17 July 2019

Prepared by: CLE Town Planning + Design

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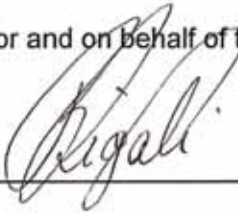
## Endorsement Page

This structure plan is prepared under the provisions of the City of Rockingham Town Planning Scheme No. 2.

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

6 September 2017 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

6/9/17 Date

6 September 2027 Date of Expiry

Table 1: Table of Amendments

Amendment No.	Description of Amendment	Amendment Type	Finally Endorsed by WAPC
1	Reclassify land north and south of Heartwood Boulevard from R30 and R40 and make associated changes to the movement network to accommodate the revised lot product.	Minor	23 July 2019

Table 2: Table of Density Plans

Amendment No.	Description of Amendment	Amendment Type	Finally Endorsed by WAPC



## Executive Summary

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The North East Baldivis Structure Plan (NEBSP) has been prepared in order to provide the City of Rockingham with a statutory framework to guide the orderly future subdivision and development of the subject site which is bounded by Kwinana Freeway to the east, Mundijong Road to the south, Baldivis Road to the west, and Pug Road to the north.

The NEBSP covers a total area of approximately 59.5394 hectares, comprising Lot 460 and 461 Baldivis Road, and part Lots 462 and 463 Baldivis Road.

The NEBSP has been prepared on behalf of Upside Property Pty Ltd, and Woodbrooke Property Pty Ltd, which are wholly owned subsidiaries of Cedar Woods Properties Limited.

The following consultants have been involved with the preparation of the NEBSP, and were responsible for the various technical reports and studies that underpin the Structure Plan:

- CLE Town Planning and Design
- RPS Environment – Environmental and Local Water Management
- Tabec – Engineering
- Plan E – Landscaping Design
- RUIC Fire – Bushfire Management Planning
- Cardno – Transport Assessment
- Lloyd George Acoustics – Transportation Noise Assessment
- Martinus Consulting – Economic and Employment Assessment

Once developed, the NEBSP will provide for a variety of housing choice through the provision of a range of densities and lot sizes accommodating a population of approximately 2,300 people through the provision of up to 830 lots.

The lot layout and access arrangements encompassed within the NEBSP will result in the creation of attractive streetscapes allowing future residents to enjoy a high level of amenity.

The NEBSP incorporates sustainable land use and lot design principles, and provides for an integrated open space, conservation and drainage network, balancing environmental, recreational and drainage objectives.

Ultimately, the NEBSP satisfies the relevant state and local strategic and statutory planning objectives and frameworks.

The area subject of this Structure Plan is identified within the East Baldivis District Structure Plan, which was endorsed by the City of Rockingham in February 2014 subject to modifications.

A summary of the key statistics for the NEBSP area are provided in the following table.

Table 3: Structure Plan Summary Table

Item	Data		Structure Plan Ref (Section No.)
Total are covered by the structure plan	59.5394 hectares		1.2.1
Area of each land use proposed:	Hectares	Lot Yield	
- Residential	30.11	795	3.2.2
- Commercial	0.6572	1	3.7
Total estimated lot yield	795 lots		Table 9
Estimated number of dwellings	795 dwellings		Table 9
Estimated residential site density	26 dwellings per hectare		Table 9
Estimated population	2226 @ 2.8 people per household		Table 9
Number of high schools	Nil		n/a
Number of primary schools	1 (3.5 hectares)		3.6
Estimated commercial floor space	1500sqm		3.7
Area of internal road reserves	16.05 hectares		3.4
Area of future road widening (Lot 460)	0.4 hectares		3.7
Estimated area and percentage of public open space given over to:	Total POS area = 8.518ha Total local parks = 5		Table 7 & 8
- Regional open space	POS area 2 0.86 ha		
- District open space	POS area 3 1.05 ha		
- Neighbourhood parks	POS area 4 0.51 ha		
- Local Parks	POS area 6 0.50 ha		
	POS area 7 0.16 ha		
	Total neighbourhood parks = 2		
	POS area 1 3.76 ha (gross)		
	POS area 5 1.74 ha		
Estimated percentage of natural area	RE Wetland (core): 0.8722ha RE Wetland (buffer): 1.598ha		Table 7 & 8

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## Structure Plan Content

This Structure Plan comprises:

### [Part One – Implementation \(as amended\)](#)

This section contains the Structure Plan Map, and outlines the purpose and intent of the Structure Plan.

### [Part Two – Explanatory Section](#)

This section contains the explanatory component of the structure plan including background information, and an explanation of the structure plan including design methodology, relevance, and compliance with the applicable planning frameworks at the State and Local Government level.

This section also includes plans and maps in support of the structure plan.

### [Appendices](#)

This section contains all of the technical reports and studies in support of the structure plan, with the level of detail contained within these reports and studies being commensurate with the context and scale of the proposed structure plan.

## Part One - Implementation

### 1.0 Structure Plan Area

This Structure Plan applies to Lots 460, 461, Part of Lot 462 and Part of Lot 463 Baldivis Road, Baldivis being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map.

The Structure Plan Map is provided in **Attachment A**.

This Structure Plan is identified as the North East Baldivis Structure Plan (NEBSP).

### 2.0 Operation

The date the structure plan comes into effect is the date the structure plan is approved by the WAPC.

### 3.0 Staging

The staging of subdivision and development within the structure plan will be guided by the following triggers:

- a. Provision of a full primary school site to service the structure plan area; and
- b. Provision of road access from Baldivis Road to access to and within the structure plan area from the existing established road network to the west

### 4.0 Interpretation and Relationship with Statutory Planning Framework

This structure plan is prepared in accordance with Part 4 of Schedule 2 (Deemed Provisions) in the *Planning and Development (Local Planning Schemes) Regulations 2015* ('the Regulations'). It is a Local Structure Plan fulfilling the requirements of City of Rockingham Town Planning Scheme No. 2 for the applicable 'Development' zone.

The Structure Plan Map (**Attachment A**) outlines future land use and zones applicable within the structure plan area.

Pursuant to the Regulations, a decision maker of an application for development approval or subdivision approval is to have due regard to the provisions of this Structure Plan, including the Structure Plan Map, Implementation Report, Explanatory Report and Technical Appendices.

## 5.0 Subdivision and Development Requirements

### 5.1 Land Use

- a. The subdivision and development of land is to be generally in accordance with the zones and reserves which appear in the structure plan map.
- b. Residential densities applicable to the structure plan area shall be those residential densities shown on the structure plan map.

### 5.2 Mechanisms to Protect Environmental Features

- a. The Resource Enhancement Category Wetland and wetland buffer area which falls within Lots 462 and 463 Baldivis Road will be contained within public open space as identified in the structure plan map.
- b. A Wetland Management Plan will be required as a condition of subdivision approval where the subdivision plan relates to Stage 1 of the structure plan.
- c. A Mosquito Management Plan will be required as a condition of subdivision approval where the subdivision plan relates to Stage 1 of the structure plan.

### 5.3 Hazards and Separation Areas

#### *Bushfire Management*

- a. No buildings or structures shall be permitted to encroach within the Asset Protection Zone identified in the structure plan map.
- b. A notification to be placed on the Certificate(s) of Title(s) will be required as a condition of subdivision approval where land or lots are deemed to be affected by a Bush Fire Hazard as identified in the Bushfire Management Plan contained within Appendix 2.
- c. Building setbacks and construction standards to achieve a Bushfire Attack Level -29 or lower in accordance with Australian Standards (AS3959-2009): Construction of buildings in bushfire prone areas shall be complied with for land or lots that are deemed to be affected by a Bush Fire Hazard as identified in the Bushfire Management Plan.
- d. Public roads abutting the Baldivis Tramway Reserve are to be wide enough to ensure that the separation between residential development and the Reserve is sufficient to ensure the Bushfire Attack Level affecting residential development is suitably low, without relying on or otherwise requiring the Reserve (whether in whole or in part) be managed in a low-threat state.

This notwithstanding, if the City of Rockingham does commit to managing the relevant portion of the reserve in a low-threat state, then the Access Street between the Reserve and the Residential R40 area may be converted to a laneway. However, this should only be done in consultation with the local government and should involve consideration, by the local government, of detailed engineering designs.

Noise Management

- e. A notification to be placed on the Certificate(s) of Title(s) will be required as a condition of subdivision approval where land or lots are deemed to be affected by transportation noise as identified in Transportation Noise Assessment contained within Appendix 3.
- f. Construction standards to achieve quiet housing design in accordance with State Planning Policy 5.4 *Road and Rail Transportation Noise and Freight Consideration in Land Use Planning* shall be complied with for lots that are deemed to be affected by transportation noise as identified in the Transportation Noise Assessment.

5.4 Residential Densities

- a. The residential densities which appear in the structure plan map are consistent with residential density targets under the Commission’s Liveable Neighbourhoods Policy.
- b. The subdivision and development of land is to be generally in accordance with the densities which appear in the structure plan map.
- c. The single house (R-MD) standards for medium density housing in structure plan areas (*Planning Bulletin 112, May 2015*) shall apply to the R25, R30 and R40 coded areas which appear in the structure plan map.

**6.0 Local Development Plans**

Local Development Plans (LDPs) shall be prepared and implemented for lots comprising one or more of the following site attributes:

- a. Lots with rear-loaded vehicle access;
- b. Lots with direct boundary frontage (primary or secondary) to an area of Public Open Space;
- c. Lots deemed to be affected by a recognised Bush Fire Hazard;
- d. Lots deemed to be affected by transportation noise; and
- e. All land zoned as ‘Commercial’ in the structure plan map.

**ATTACHMENT A**  
**STRUCTURE PLAN MAP**

**CLE Ref. 3043-72C-01**





**Legend:**

- Structure Plan Boundary

**Zones**

- Residential R25
- Residential R30
- Residential R40
- Residential R60-80
- Commercial

**Reserves**

- Public Open Space (POS)
- PS Public Purposes - Primary School
- Wetland
- Wetland Buffer
- Bushfire Hazard Separation Area
- Future Road Widening
- Area Cleared

**Road Hierarchy**

- Neighbourhood Connector A
- Access Street

**Note:**  
 All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval. The boundaries shown on this plan should not be used for final detailed engineers design.

**Source Information:**  
 Site boundaries: Landgate  
 Adjoining information: Landgate

## Part Two – Explanatory Report

## 1.0 Planning Background

### 1.1 Introduction and Purpose

This Structure Plan hereinafter referred to as the North East Baldvis Structure Plan (NEBSP) has been prepared on behalf of Upside Property Pty Ltd and Woodbrooke Property Pty Ltd which are wholly owned subsidiaries of Cedar Woods Properties Limited.

The purpose of the NEBSP is to facilitate the orderly future subdivision and development of the subject site, and to provide a range of housing types and densities to satisfy the demand for residential housing within the locality.

In addition to the planning considerations canvassed within this report, the preparation of this structure plan has been informed by a number of technical and design investigations, which are referred to in this report and the accompanying technical appendices.

This structure plan has been prepared in accordance with the design requirements outlined in Liveable Neighbourhoods, and responds to requirements outlined in the City of Rockingham Town Planning Scheme No 2 (TPS 2).

The format of this structure plan follows that set out in the Western Australian Planning Commission's (WAPC) Structure Plan Framework (August 2015), consisting of three parts:

- Part 1: Implementation Section: Contains the Structure Plan Map and outlines the requirements that will be applied when assessing subdivision and development applications.
- Part 2: Explanatory Section: Discusses the key outcomes and planning implications of the background and technical reports and describes the broad vision and more detailed planning framework being proposed. Part 2 is based on a detailed site specific analysis of opportunities and constraints and the following technical reports and strategies:
  - Environmental Assessment Report (RPS);
  - Bushfire Management Plan (RUIC Fire);
  - Local Water Management Strategy & Addendum (RPS);
  - Transport Assessment & Addendum (Cardno);
  - Engineering Infrastructure Report (TABEC); and
  - Landscape Master Plan (Plan E).
- Part 3: Technical Appendices: Includes the technical reports and supporting plans and maps prepared by the project team to support the structure plan.

### 1.2 Land Description

#### 1.2.1 Location and area

The subject site is situated approximately 9 kilometres (km) south-east of the Rockingham City Centre, and 42 km south of the Perth Central Business District in the locality of Baldvis (refer **Figure 1**).



The combined total land area of the parent lots comprised within the subject site is 67.82 hectares, however due to a portion of Lots 462 and 463 Baldivis Road areas being excluded from the structure plan for the purpose of future transfer into the MRS Primary Regional Road Reservation, the total structure plan area (subject site) is 59.5394 hectares.

### **1.2.2 Land use**

The following land uses are contemplated within the structure plan area:

- Residential comprising densities which range from R25 to R40
- Commercial
- Primary School
- Public Open Space
- Wetland and wetland buffer
- Road reserves

The subject site is comprised of predominantly cleared paddocks some of which remain completely unused, or used for horse grazing and agistment. The historical use of the subject site has been principally for agriculture and broad-scale farming.

The properties to the north of the subject site on the opposite side of Pug Road share a similar current and historical land use.

A clay quarry is situated at Lot 1 Mundijong Road to the east of the subject site, separated by the Kwinana Freeway.

A sand quarry is situated at Lot 1355 Baldivis Road to the west of the subject site, separated by the Baldivis Tramway Reserve and Baldivis Road.

A limestone and sand quarry is situated at Lot 800 Kerosene Lane and Lot 2170 Millar Road to the west of the subject site and is also separated by the Baldivis Tramway Reserve and Baldivis Road.

A cemetery operated by the Metropolitan Cemeteries Board, and referred to as Rockingham Memorial Park is situated to the south of the limestone and sand quarry.

The Kwinana Freeway abuts the subject site to the east and Mundijong Road abuts the subject site to the south beyond the portion of Lot 463 that has been excluded from the structure plan boundary for future roads.

### **1.2.3 Legal Description and Ownership**

The subject site is comprised of four individual landholdings owned by two separate entities which are wholly owned subsidiaries of Cedar Woods Properties Ltd. These landholdings are formally described as follows:

**Table 4 – Land Title Particulars**

Lot No.	Certificate of Title Details	Registered Proprietor(s)	Lot Area
460	Plan 202741, Volume 1251, Folio 396	Upside Property Pty Ltd	19.56ha
461	Plan 202741, Volume 1251, Folio 396	Upside Property Pty Ltd	18.62ha
462	Plan 202741, Volume 2158, Folio 269	Woodbrooke Property Pty Ltd	17.61ha
463	Plan 202741, Volume 2169, Folio 935	Woodbrooke Property Pty Ltd	12.03ha

Lot 460 is comprised of two non-contiguous land parcels bisected by Baldvis Road and the Baldvis Tramway Reserve. Lot 463 is also comprised of two non-contiguous land parcels bisected by Mundijong Road.

The structure plan boundary excludes a portion of Lots 462 and 463 Baldvis Road, which has been retained in the Urban Deferred zone in the MRS, and will be set aside as separate lots to facilitate future acquisition by Main Roads and reservation by WAPC for Primary Regional Roads associated with the construction of the future Fremantle-Rockingham Controlled Access Highway project. The southernmost non-contiguous portion of Lot 463 has also been excluded from the structure plan boundary.

### 1.3 Planning Framework

#### 1.3.1 Zoning and reservations

The subject site is zoned 'Urban' in the Metropolitan Region Scheme (MRS). The zoning context is identified in **Figure 2**.

The subject site is zoned 'Development' in the City of Rockingham Town Planning Scheme No. 2 (TPS 2). The Scheme provisions applicable to the Development zone provide that subdivision and development is to be in accordance with a Structure Plan adopted by the Commission.

The subject site is also included in Development Area 40 (DA 40) as identified in Schedule 9 of TPS 2. The provisions of TPS 2 relating to DA 40 give rise to the requirement for a Structure Plan to be prepared and adopted.

#### 1.3.2 Draft regional and sub-regional structure plan

To realise the vision encapsulated in *Directions 2031 and beyond* and the *State Planning Strategy 2050*, the Western Australian Planning Commission, through the Department of Planning has created a series of detailed draft planning frameworks, responding to those deepening and emerging challenges, with a unified, long-term growth strategy for land use and infrastructure for the Perth and Peel regions.

The *Perth and Peel@3.5million* strategic suite of documents has been developed to engage the community in open discussion on expectations of what our city should look like in the future, on how we can maintain our valued lifestyle and on how we can realistically accommodate a substantially increased population.

Together with the Perth and Peel@3.5million document, four draft sub-regional planning frameworks have been adopted for the Central, North-West, North-East and South Metropolitan Peel sub-regions.

In terms of the South Metropolitan Peel sub-region framework, this document provides guidance for:

- the preparation of amendments to the Perth metropolitan and Peel region schemes, local planning strategies/schemes and district, local and activity centre structure plans; and
- the staging and sequencing of urban development to inform public investment in regional community, social and service infrastructure.

The subject site has been the subject of a recent zoning change in the MRS to transfer the land into the Urban zone. The South Metropolitan Peel sub-regional framework document is reflective of the current zoning in the MRS and this factor is also reflected in the staging and sequencing of future urban development specifically to the south of the subject site in localities beyond Baldivis within the City of Rockingham.

### **1.3.3 Planning strategies**

#### **1.3.3.1 Directions 2031**

Directions 2031 is the current spatial planning framework for Perth and Peel, and outlines the planning vision and direction which will guide the planning of the region to 2031.

The Strategy recognises the benefits of a more consolidated city, which includes;

- A reduced overall need for travel via private vehicle;
- Supports the use of public transport, cycling and walking for access to services, facilities and employment; and
- A more energy efficient urban form.

The Strategy aims to provide for different lifestyle choices, vibrant nodes for economic and social activity and a more sustainable urban transport network. A key component of the strategy is to increase the gross residential densities in greenfield areas and to provide for greater housing diversity, which are items specifically relevant to the Structure Plan.

Directions 2031 seeks a 50% increase in the current average residential density of 10 dwellings per gross urban zoned hectare in new development areas i.e. 15 dwellings per gross urban zoned hectare of land. The Structure Plan provides for residential densities well in excess of this target minimum.

Endorsement of the proposed Structure Plan will facilitate subdivision and development of the subject site and assist in meeting the objectives established under Directions 2031. The proposed densities outlined in the Structure Plan will assist in meeting the increase in density requirements as per Directions 2031.

### **1.3.4 State planning policies**

The following State Planning Policies and operational policy are noted as being specifically relevant to the orderly planning of the structure plan area.

#### **1.3.4.1 Liveable Neighbourhoods**

The Western Australian Planning Commission's (WAPC) Liveable Neighbourhoods Policy is intended to guide the subdivision and development of land in Western Australia. The key principles of this policy include:

- Providing a variety of lots sizes and housing types to cater for the diverse housing needs of the community at a density that can ultimately support the provision of local services;
- To ensure cost-effective and resource efficient development to promote affordable housing; and
- To maximise land efficiency.

Liveable Neighbourhoods provides guidance for the design and development of greenfield subdivision through eight design elements; community design, movement networks, lot layout, public parkland, urban water management, utilities, activity centres and employment, and schools. These various elements have been considered in the preparation of the NEBSP, and are discussed as appropriate in later sections of this report.

#### 1.3.4.2 State Planning Policy No. 2.1 – Peel Harvey Coastal Plain Catchment

The objectives of Statement of Planning Policy (SPP) 2.1 reflect the environmental objectives of the Peel-Harvey EPP and aim to ensure that changes to land use within the catchment are controlled to avoid and minimise environmental damage.

The SPP contains a number of general and specific policy provisions relating to drainage. The policy states that subdivision proposals shall make provision for a drainage system that maximises the consumption and retention of drainage on site. Biological wetland filters or other means of drainage water retention or treatment approved by the EPA are to be incorporated into drainage designs, possibly by amendment of the soils in drainage basins or by the provision of wetland filters with nutrient-retentive soil amendments.

#### 1.3.4.3 State Planning Policy No. 3 – Urban Growth and Settlement

This Policy sets out the principles and considerations which apply to the planning of urban growth settlements in Western Australia. The Policy aims to facilitate sustainable patterns of urban growth and settlement and recognises that the State is undergoing rapid growth and change which is expected to continue. The policy acknowledges that the spread of urban development intensifies pressures on valuable land and water resources, imposes costs for the provision of infrastructure and services, increases dependence on private cars and creates potential inequities for those living in the outer suburbs where job opportunities and services are not so readily available.

The following summary of policy objectives and corresponding NEBSP response to each is provided below.

**Table 5 – SPP No.3 Policy Objectives and Structure Plan Response**

SPP No.3 Objective	NEBSP Response
To promote a sustainable and well planned pattern of settlement with sufficient and suitable land to provide for a wide variety of housing, employment, recreation facilities and open space.	The Structure Plan provides for a wide variety of housing densities and typologies having regard to the nearby proximity of the Structure Plan area to the Baldvis District Centre and Wellard Railway Station.
To build on existing communities with established local and regional economies, concentrate investment on the improvement of services and infrastructure and enhance the quality of life in those communities.	The subject site is located within an existing identified urban development area earmarked for urban subdivision and development. Being located in the South Western corridor of the Perth metropolitan area, planning and development of the land makes best use of existing infrastructure already present in the locality (e.g. utilities, transport infrastructure).
To manage the growth and development of urban areas in response to the social and economic needs of the community and in recognition of relevant climatic, environmental, heritage and community values and constraints.	Economic needs of the community have been established through district level Structure Planning for the locality.
To promote the development of a sustainable and liveable neighbourhood form which reduces energy, water and travel demand whilst ensuring safe and convenient access to employment and services by all modes, provides choice and	The proposed Structure Plan layout seeks to maximise energy efficient and climate responsive design by ensuring all lots can be provided in a north-south or east-west configuration. Sustainable urban water management principles have been applied to the treatment of stormwater and design of Public Open Space. Travel demand will be reduced through the provision of local employment and services, and a permeable

SPP No.3 Objective	NEBSP Response
affordability of housing and creates an identifiable sense of place for each community.	local movement network that encourages walking and cycling.
To coordinate new development with the efficient, economic and timely provision of infrastructure and services.	Development within the Structure Plan will be coordinated with the Urban zoned area to the west which contains established infrastructure and utility services that will be extended to service the structure plan area.

**I.3.4.4 SPP 5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning**

The objectives in the Policy are to:

- Protect people from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of proposals;
- Protect major transport corridors and freight operations from incompatible urban encroachment;
- Encourage best practice design and construction standards for new development proposals and new or redevelopment transport infrastructure proposals;
- Facilitate the development and operation of an efficient freight network; and
- Facilitate the strategic co-location of freight handling facilities.

**I.3.4.5 SPP 3.7 – Planning in Bushfire Prone Areas**

The objectives of this Policy are to:

- Facilitate the avoidance of placing people, property and infrastructure in areas of extreme bushfire risk;
- Reduce vulnerability to bushfire through the identification and assessment of bushfire hazards and risk in decisions at all stages of the planning process, including strategic planning, regional and local planning schemes, and structure planning through to subdivision and development;
- Ensure that subdivision, development and land-use proposals take into account bushfire protection requirements and include specified fire protection measures, especially over land that has or will have a moderate or extreme bushfire hazard level, and/or land where construction standards of BAL-12.5 and above apply; and
- Achieve a responsible and balanced approach between bushfire risk management measures and landscape amenity and biodiversity conservation objectives.

Planning or development applications within identified bushfire-prone areas are to undertake a bushfire hazard assessment (low, moderate or extreme), prepared by a fire consultant, in accordance with the methodology set out in the *Guidelines for Planning in Bushfire Prone Areas*.

**I.3.4.6 EPA Guidance Statement No. 3 –Separation Distances between Industrial and Sensitive Land Uses**

EPA Guidance Statement No. 3 Separation Distances between Industrial and Sensitive Land Uses (EPA 2005) provides generic separation distances. Site-specific studies are only required if a reduction of the buffer is required. The generic distance is not intended to be an absolute separation distance; rather they are a default distance for the purposes of:

- Identifying the need for specific separation distance or buffer definition studies; and
- Providing general guidance on separation distances in the absence of site-specific technical studies (EPA 2005).

### 1.3.5 Local planning policies

The following Local Planning Policies are noted as being specifically relevant to the orderly planning of the structure plan area.

#### 1.3.5.1 Local Planning Policy 3.1.2 – Local Commercial Strategy

The purpose of this Local Planning Policy is outlined as follows:

- Establish the objectives, principles and key strategies for retailing and commercial development in Rockingham.
- Apply the strategic planning policies set out in the State Government's *Metropolitan Centres Policy Statement (2000)*.
- Provide a context for the review of the City of Rockingham TPS2 in respect of provisions for retail and commercial development.
- Guide private sector investment and the City's capital works expenditure.
- Provide Council with a sound basis for decision making on development applications, rezoning proposals and the provision and location of future Council services and facilities.
- Identify centres and commercial locations requiring particular action, for example, where new ideas such as *Community Design Codes* may change the urban form of existing structure plans or for the restoration and improvement of established centres.

With regard to Precinct 4 – Baldivis, the Local Planning Policy applies the following objectives and principles in accordance with SPP4.2:

- Capitalise on opportunities to revitalise activity centres in established urban areas, as a catalyst for urban renewal in the surrounding catchment;
- Provide sufficient development opportunities to enable a diverse supply of commercial and residential floor space to meet projected community needs;
- Cater for a full range of needs from shopping, commercial and community services from local convenience to higher-order comparison retail/goods and services;
- Mitigate the potential for an over-concentration of shopping floor space in large activity centres at the expense of a more equitable level of service to communities; and
- Promote the walkable neighbourhoods principle of access to employment, retail and community facilities by distributing activity centres to improve access by foot or bicycle, rather than having to depend on access by car in urban areas.

#### 1.3.5.2 Local Planning Policy 3.4.1 – Public Open Space

The purpose of this Local Planning Policy is outlined as follows:

- To ensure that all residential development is complemented by well located areas of POS that provide for the recreational and social needs of the community.
- To ensure that POS is designed, developed and maintained to an acceptable standard to enhance local amenity.

### 1.3.5.3 Baldivis Tramway Reserve Management Plan (2014)

The purpose of the Baldivis Tramway Reserve Master Plan is to establish key directions; including use, development and management of the reserve over the next ten years. The vision and purpose of the Plan are to be driven by the following overarching objectives.

- Conserve and enhance the natural and cultural environment
- Encourage community use of and engagement in the reserve
- Coordinate management practices and responsibilities within the reserve
- Improve sense of place through landscaping, infrastructure and interpretive opportunities
- Ensure equity and safety of reserve users

The portion of the Baldivis Tramway Reserve that abuts the subject site falls within Precinct 1. The management objectives for Precinct 1 of the tramway reserve are outlined as follows:

- Maintain and protect all existing vegetation
- Manage priority weed species
- Focus revegetation of native species in key feature nodes and primary access points
- Utilise designated offset areas for future revegetation of native species to improve landscape connectivity
- Ensure adequate fire safety measures, such as breaks and slashing
- Establish an integrated DUP network
- Provide a safe pedestrian detour around the Kulija Road intersection
- Create a Wetland Concept Area for nature appreciation and interpretation

### 1.3.6 Other approvals and decisions

The NEBSP area is included in the East Baldivis District Structure Plan (DSP), which was endorsed by the City of Rockingham in February 2014 (subject to modifications). The context of the subject site relative to the DSP is identified in **Figure 3**.

The DSP illustrates the broad land use framework across the entire East Baldivis 'cell' including the major road network, neighbourhood structure, education, community and significant open space areas. It forms the basis of coordinating and considering structure plans and plans of subdivision to be prepared by landowners in the area.

**I.3.7 Pre-lodgement consultation****Table 6 – Pre-lodgement Consultation**

Agency	Date of consultation	Method of consultation	Summary of outcome
City of Rockingham	November 2014	Meeting	Pre-lodgement meeting to discuss draft structure plan layout and general approach. Conclusions from this meeting with respect to general layout, interface between POS and residential lots etc has been incorporated into the final SP.
Office of the Environmental Protection Authority (OEPA)	August 2013	Correspondence	OEPA has confirmed support for the buffer considerations and management measures contemplated by the final SP.
Main Roads Western Australia (MRWA)	May 2013	Correspondence	Main Roads WA has provided vehicle movement volumes and statistics associated with the surrounding road network which has been addressed in the Transport Assessment and Transportation Noise Assessment that are appended to this report.
Water Corporation	September 2013	Phone discussions & correspondence	The Water Corporation has provided information regarding water and wastewater availability and method of servicing the SP area which has been addressed in the Engineering Infrastructure Report appended to this report.
City of Rockingham	October 2016	Meeting	Meeting to discuss structure plan layout and response to WAPC comments of 6/10/16. Conclusions from this meeting with respect to general layout, interface between POS and residential lots, BMP etc have been incorporated into the final SP.
City of Rockingham	November 2016	Correspondence	Correspondence from Council providing comment on revised design tabled in October 2016. Comments have been incorporated into the final SP.



## 2.0 Site Conditions and Constraints

An Environmental Assessment Report (EAR) has been specifically prepared to support the NEBSP.

The EAR has been prepared by RPS Environment, and is provided in **Appendix 1**.

The EAR identifies the site conditions and environment unique to the NEBSP area, and outlines management measures in response to the key environmental issues.

A summary of the site conditions and environment, and associated management measures is provided as follows.

### 2.1 Biodiversity and Natural Area Assets

#### 2.1.1 Flora and Vegetation

Previous flora and vegetation surveys undertaken within the NEBSP area did not identify any Threatened, Rare or Priority Flora Species. Additionally, there was little or no native annual or understorey flora identified. The majority of the NEBSP is cleared farmland and pasture consisting of alien grasses and herbs, being largely devoid of native vegetation as a result of historical agricultural land uses.

Aside from minimising road crossings from the NEBSP area through the adjoining Baldvis Tramway Reserve (not surveyed as part of this report) to minimise disruption of any vegetation within the Tramway Reserve, there are no specific management responses applicable to the retention and management of flora and vegetation within the NEBSP with the exception of the Resource Enhancement (RE) wetland as addressed in the preceding sections of this report (Part 1 Section 5).

#### 2.1.2 Fauna

The majority of the site has been historically cleared and as a consequence, significant fauna habitat has been largely removed.

A search of the Commonwealth Department of Environment (DoE) website for matters of National Environmental Significance (NES) protected under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) highlighted a number of listed fauna species that potentially may utilise this habitat. Of this list, the key species that could potentially be impacted through development of the site has been identified in Section 3.4 of the EAR.

Waterbirds have been known to forage opportunistically in the open paddock areas adjacent to the core RE wetland during periods of seasonal inundation. However, waterbirds are known to and have been observed foraging in areas of standing water in open paddocks across the broader Peel region; particularly adjacent to the Peel Main Drain (PMD) or in nearby lakes, such as Lake Cooloongup and Lake Walyungup.

The proposed management and use of the wetland and surrounding buffer proposes to replicate the predevelopment conditions associated with both surface and groundwater availability to the existing *Melaleuca raphiophylla* within the RE wetland. Therefore waterbirds can continue to utilise the core RE wetland area and the surrounding buffer after seasonal rain events.

The RE wetland will be retained and protected within the NEBSP consistent with the advice received from the OEPA. It is anticipated that in retaining and rehabilitating the RE wetland, a more suitable water bird habitat will be created.

The potential habitat on the subject site for black cockatoo species comprises of 0.15 ha of poor foraging quality *Eucalyptus rudis* trees. There is no roosting or breeding habitat within the subject site.

Although the LSP site has limited fauna habitat values due to historical clearing, the maintaining of mature trees within public open space (POS) areas where possible and Tramway Reserve will assist in preserving avifauna habitat.

## 2.2 Landform and Soils

The topography of the NEBSP area is low-lying with areas subject to seasonal inundation. The topography of the NEBSP is generally flat, ranging from 4.4 metres Australian Height Datum (m AHD) to 6.6 m AHD approximately 5 m AHD across most of the site.

Based on the Department of Environmental Regulation's regional Acid Sulfate Soils (ASS) risk mapping, the NEBSP area has been identified as having a "moderate to low" risk of ASS occurring within 3 m of the natural soil surface.

A preliminary site assessment for ASS will be undertaken, and a subsequent management plan will be prepared (if required) at the subdivision stage.

## 2.3 Groundwater and Surface Water

### 2.3.1 Groundwater

The NEBSP area is located within the Stakehill Groundwater Area and more specifically the Tamworth Swamp and Stakehill Confined sub-areas. The aquifers within each respective groundwater sub-area comprise the superficial Swan (unconfined), Cattamarra, Leederville and Yarragadee North formations.

The Perth Groundwater Atlas indicates that the groundwater levels beneath the NEBSP are approximately 3 m AHD. This equates to groundwater at 2 m to 3 m below ground level. Pre-development observations indicate that the site has the potential to become inundated in the winter months.

The depth to groundwater is shallow and levels are expected to rise even further in winter, and further again with urban development due to the increase in impervious surfaces and higher infiltration rates associated with imported fill. On this basis, groundwater levels will need to be controlled by a combination of fill material and subsurface drainage.

The issue of groundwater management is addressed in further detail in later sections of this report (Urban Water Management).

### 2.3.2 Surface Hydrology and Wetlands

The NEBSP area is located within the Peel Estuary–Serpentine River Catchment and Peel Main Drain (PMD) Sub-Catchment. The PMD is situated to the east, and drains stormwater run-off from the catchment into the Serpentine River and ultimately the Peel–Harvey Estuary.

Several small open 'agricultural' drains traverse the NEBSP area, which convey surface water to one of four culverts that pass beneath the Kwinana Freeway and discharge into the PMD. Surface water not conveyed via the open drains would otherwise sheet flow off the site until it reaches these culverts.

Flood mapping indicates a large portion of the NEBSP area is within the floodplain of the PMD during major river flows. Whilst the area is flood prone, flood plain mapping undertaken on behalf of the Department of Water indicates that proposed development in flood prone areas is acceptable subject to the implementation

of management strategies which include ensuring a minimum habitable floor level of 0.50 m above the adjacent 1 in 100 year ARI flood level is implemented in order to provide adequate flood protection.

Engineering fill will be required across the NEBSP area to provide appropriate separation to 1 in 100 year ARI flood level.

A number of Multiple Use category (MU) wetlands and a small Resource Enhancement category (RE) wetland situated within Lot 462 are located within the NEBSP area.

The MU wetlands are extremely degraded, and no specific management responses are required.

Site surveys indicate that the RE wetland is in a degraded condition, with modified vegetation, and no Threatened or Priority Flora species recorded.

Consultation has been undertaken with the Office of the Environmental Protection Authority (OEPA) regarding management of the RE wetland within the NEBSP. The OEPA is satisfied with the inclusion of the RE wetland within the NEBSP providing the following management measures are implemented to protect the environmental values of the wetland:

- Provision of a buffer from the mapped edge of the wetland, primarily to retain the *Melaleuca raphiophylla* trees
- Maintaining the ecological water requirements of the *Melaleuca raphiophylla* trees by incorporating the infiltration of surface waters within the wetland buffer, as it currently occurs
- Weed management
- Revegetation of the core wetland area
- Surface water retention swales planted using endemic species
- Interface treatments between conservation areas and recreation areas

A wetland management plan will be prepared and implemented at the subdivision stage in order to address the management of the RE wetland.

## 2.4 Bushfire Hazard

A Bushfire Management Plan (BMP) and Bushfire Protection and Design Report have specifically been prepared to support the NEBSP. These studies have been prepared by RUIC Fire, and are provided in **Appendix 2**.

In order to reduce the risk of bushfire to people, property and infrastructure, the WAPC has prepared State Planning Policy (SPP) identified as SPP 3.7: Planning in Bushfire Prone Areas. SPP 3.7 specifies the operation of the SPP, and where it is intended to apply. Specifically, the SPP requires the preparation of a BMP to assess the risk and where practicable, reduce potential impact from vegetation fire. Section 3.0 of the Bushfire Management Plan (Page 36) details compliance with the requirements of SPP3.7.

The objectives of the BMP are as follows:

- Achieve consistency with objectives and policy measures of the current Guidelines for Bushfire Prone Areas (GfBPA); and any local planning scheme provisions relating to bushfire;
- Understand and document the extent of bushfire risk for the BMP area;
- Prepare bushfire risk management measures for bushfire management of all land subject of the Plan, with due regard for people, property, infrastructure and the environment;

- Nominate individuals and organisations responsible for fire management and associated works within the plan area (e.g. local government for land vested in it and private property owners for freehold land); and
- Define an assessment procedure which will evaluate the effectiveness and impact of proposed, as well as existing, bushfire risk management measures and strategies.

Following the full development of the NEBSP, areas of remnant vegetation will be cleared within the development site and the majority of the remnant vegetation outside of the site in the Tramway Reserve and within the Kwinana Freeway road reserve will remain and to this end, may pose an ongoing bushfire hazard.

It is noted that the hazard mapping has not included the consideration of the noise attenuation wall that will be located on the eastern boundary of the LSP area. The noise wall will have a height of 2.4m above ground level and be of masonry construction, thereby providing radiant heat and flame shielding properties, however it is not relied upon for the purpose of determining risk and mitigation.

The BMP makes specific reference to the southern portion of the structure plan area adjacent to a stand of remnant vegetation within the Baldvis Tramway Reserve. The vegetation in this area is considered to warrant a specific analysis of the radiant heat impact on the subject site. The study undertaken within this area which is documented in the Bushfire Protection Design Report concludes that incorporating a Building Protection Zone of 14 metres in width for future lots adjacent to Class B Woodland, and a BPZ of 8 metres in width for future lots adjacent to Class G Grassland will satisfy the GfBPA Performance Criteria P4. The Structure Plan identifies a Bushfire Hazard Separation Area that at subdivision stage will incorporate either road reserve or managed private open space between lots and the Tramway Reserve to serve as an appropriate asset protection zone.

The BMP has determined that the subject site does not exhibit physical features, weather conditions or historical incidence of bushfire that suggests the site is at an increased threat from potential bushfire activity compared to the surrounding area.

All residual bushfire related risk levels affecting the site are identified as low. In accordance with GfBPA, the bushfire risk to the proposed development is not considered unreasonable and should not prohibit development of the site, subject to the measures detailed in this Bushfire Management Plan being complied with. Given the limited potential for bushfire activity within the development and low level of bushfire related risk from external bushfire events, the current development design inclusive of lots backing onto the limited vegetation structures of the south western boundary is considered suitable and does not expose future buildings at an unacceptable level of bushfire related risk or potential radiant heat flux impact.

Although a limited bushfire event occurring within or adjacent to the site remains a credible threat, it is concluded that the proposed development is not subject to an unacceptable level of radiant heat impact, hazard level or bushfire related risk.

## 2.5 Context and Other Land Use Constraints and Opportunities

An Opportunities and Constraints Plan which illustrates the subject site and surrounding context is provided in **Figure 4**. An aerial overview of the proposed structure plan is also provided in **Figure 5**. A brief discussion regarding site context, constraints and opportunities is provided as follows.

### 2.5.1 Contamination

A review of the Department of Environment Regulation (DER) Contaminated Sites Database determined there are no registered contaminated sites within the NEBSP area.

In 2010, a Preliminary Site Investigation (PSI) was undertaken to identify possible areas and sources of potential contamination within the subject site. The PSI identified that the majority of the subject site has been used for grazing and agricultural purposes and there is little likelihood of any potential contamination sources. Accordingly, the subject site is not affected by contamination and no further consideration of this matter is required.

### 2.5.2 Noise

An Acoustic Assessment was undertaken for the East Baldivis DSP area by Herring Storer Acoustics (2009) in view of the proximity of the cell to the Kwinana Freeway and local arterial routes of Mundijong Road.

The results of the acoustic assessment indicate that noise received at residences located adjacent to the Kwinana Freeway and Baldivis Road in the year 2025 will exceed the “Noise Limits” as outlined in State Planning Policy 5.4: *Road and Rail Transport Noise and Freight Considerations in Land Use Planning* (WAPC 2009). However, the level of exceedance would only be minor.

Given the possible level of exceedance, Herring Storer Acoustics concluded that compliance with the Commission’s State Planning Policy could be achieved through a combination of construction of noise walls, building design and notification on titles.

A Transportation Noise Assessment has specifically been prepared to support the NEBSP. This assessment has been undertaken by Lloyd George Acoustics, and is provided in **Appendix 3**.

As part of this assessment, noise monitoring was undertaken near the Kwinana Freeway to quantify existing noise levels and to assist in calibrating a noise model for the site. To satisfy the requirements of State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning, the following has been identified as indicative noise mitigation:

- Construct noise wall on the boundary with a nominal height of 2.4 metres. Noise wall is to be solid, free of gaps and of a material having a minimum surface mass of  $15\text{kg/m}^2$ ;
- For dwellings requiring Packages A, B or C acoustic attenuation treatments, alternatives can be accepted if supported by a report by a suitably qualified acoustical engineer (member firm of the Association of Australian Acoustical Consultants);
- All affected lots are to have notifications on lot titles as per Section 4.5 of SPP 5.4
- Ground level of all affected lots will receive noise levels below the limit and will therefore be a ‘reasonable’ outdoor acoustic amenity in accordance with SPP 5.4. For lots where the ground level noise is above the target, one outdoor living area is to be provided where practicable, in a location where noise is no more than the target.

Lots closer to Mundijong Road are calculated to be below the target in 2031, with the inclusion of the 2.4m high noise wall. However, this interchange will be significantly upgraded at some time after 2031 as part of the Fremantle Rockingham Controlled Access Highway (FRCAH). As such, similar treatments are also recommended for these lots adjoining Mundijong Road, even though noise levels through to 2031 will be below the target. In the future when the FRCAH project is undertaken, the road builder will be required to undertake their own noise assessment, to ensure the FRCAH project meets the limit at all residences. As the road design and traffic volumes will significantly change at that time, there may be a requirement to construct additional walls or increase the height of existing walls.

As the subdivision design is completed along with finished lot levels, the recommendations of this report are to be refined.

### 2.5.3 Surrounding Land Uses

The EAR notes that the surrounding land uses which have been identified Section 1.4 of this report comprising sand, clay and limestone quarrying activities are either:

- Adequately separated from the subject site in accordance with the EPA Guidance Statement on Separation Distances Between Industrial and Sensitive Land Uses;
- Contain buffers within the boundaries of their site areas, thereby mitigating off-site impacts; and/or
- The operational lifespan of these quarrying activities will cease prior to the final build out of the NEBSP area.

## 3.0 Land Use and Subdivision Requirements

### 3.1 Land Use

The key design principles which underpin the NEBSP are outlined as follows:

- A framework for subdivision and development of land within the NEBSP area that integrates with the broader district and regional context;
- Variety of housing choice through a range of densities and lot sizes;
- Sustainable land use and lot design that responds to solar orientation principles;
- An integrated open space, conservation and drainage network, balancing environmental, recreational and drainage objectives;
- Passive surveillance of POS through the provision of higher density adjacent to POS areas in line with CPTED principles; and
- Housing design, lot layout and access arrangements which create attractive streetscapes.

### 3.2 Public Open Space

The NEBSP provides for a total of 8.44 hectares of POS (to be ceded as public open space) across the NEBSP area.

In accordance with the Element 4 (Public Parkland) requirements of Liveable Neighbourhoods, the POS Schedule for the SP is provided in Table 7 as follows.

**Table 7 – Public Open Space Schedule**

<b>Site Area</b>			<b>59.5394</b>
Less		Subtotal	
Resource Enhancement Category Wetland (core)	0.8722	0.8722	
Net site area			58.6672
<b>Deductions</b>			
Primary School	3.6	4.9633	
Commercial	0.633		
Dedicated Drainage Reserve (1:1 area)	0.3303		
Area of Future Road Widening (Lot 460)	0.4		
Gross Subdivisible Area			53.7039
Public Open Space Required @ 10%			<b>5.37039</b>
May comprise			
<i>minimum 80% unrestricted POS</i>		4.296312	<b>5.37114</b>
<i>maximum 20% restricted POS</i>		1.074078	
<b>Unrestricted POS sites</b>			
POS 1	1.0343	4.9937 ha	
POS 2A	0.4744		
POS 2B	0.2796		
POS 2C	0.048		
POS 3	0.7872		
POS 4	0.4468		
POS 5	1.5758		
POS 6	0.3377		
POS 7	0.1671		
<b>Restricted Use POS Sites</b>			
POS 1 (Incl REW Buffer 1.5794ha)	2.638	3.4522 ha	
POS 2A	0.045		
POS 2B	0		
POS 2C	0		
POS 3	0.175		
POS 4	0.039		
POS 5	0.125		
POS 6	0.126		
POS 7	0		
<b>Maximum 20% Restricted Use POS</b>		<b>1.074ha</b>	
Restricted POS not included in POS contribution	2.377972 ha		
<b>TOTAL POS PROVISION (Credited)</b>			<b>6.067928 ha</b>



The ultimate function and usability of the POS for active and passive recreational purposes (including local water management functions) will be subject to further detailed design at the subdivision stage to the satisfaction of the local authority.

The following table provides a full breakdown of each POS area.

**Table 8 – Public Open Space Area Statistics**

POS area	Gross Area (Ha)	Total Area of 1:1 Year Drainage (Ha)	Total Area (Ha) of Restricted POS (1:5 Drainage Area)	Creditable Restricted Buffer	Total Area (Ha) of Restricted POS	Net Unrestricted POS Area (Ha)
1	3.769	0.0967	1.04	1.598	2.638	1.0343
2A	0.542	0.0226	0.045		0.045	0.4744
2B	0.2796	0	0		0	0.2796
2C	0.048	0	0		0	0.048
3	1.051	0.0888	0.175		0.175	0.7872
4	0.5184	0.0326	0.039		0.039	0.4468
5	1.745	0.0442	0.125		0.125	1.5758
6	0.5091	0.0454	0.126		0.126	0.3377
7	0.1671	0	0		0	0.1671
<b>Total</b>	<b>8.6292</b>	<b>0.3303</b>	<b>1.55</b>		<b>3.148</b>	<b>5.1509</b>

Further discussion regarding the use and treatment of POS areas is provided as follows.

### 3.2.1 Landscaping

A Landscape Masterplan has specifically been prepared to support the NEBSP (refer **Figure 6**). In addition to the Landscape Masterplan, concept plans have been prepared for each specific POS area identified in Table 8 together with key cross sections. These plans and cross sections are provided in **Figure 7**.

### 3.2.2 Baldvis Tramway Reserve

With respect to the adjoining Baldvis Tramway Reserve which runs parallel to Baldvis Road along the western boundary of the subject site, the landscape masterplan contemplates the provision of a landscaped entry statement.

These works will be subject to the approval of the City of Rockingham at the subdivision stage, which will provide the opportunity for the City to consider a detailed planting schedule submitted by the developer.

The EAR notes that vegetation within the Tramway Reserve consists of patches of *Eucalyptus rudis* with the occasional *Melaleuca raphiophylla* and *Corymbia calophylla*. The EAR also notes that there are groups of trees particularly in the southern end of the Tramway Reserve in “Good” condition, albeit that the Tramway is largely dominated by large open areas supporting weed growth.

With respect to the interface between the subject site and the Baldivis Tramway Reserve, the tramway reserve masterplan provides a number of indicative cross sections for which development interfacing should have due regard to. Figure 4.2.3 – Indicative Section C is particularly instructive, and represents the anticipated interface treatment that would be implemented for the majority of the subject site where a road interface is contemplated along the western boundary. Opportunities for a terraced interface between the boundary of lots and the tramway reserve may also be possible (Figure 4.2.1). The interface treatments between the subject site and tramway reserve will be considered in further detail at the detailed design/subdivision stage when final development levels are confirmed through the engineering design and Urban Water Management Plan.

### 3.2.3 Resource Enhancement Wetland

The RE wetland buffer and the encircling POS area will accommodate the following uses:

- re-vegetation
- bio-retention swales
- walking/cycle paths
- recreational spaces

Interface treatments proposed for protection of the RE wetland will be detailed in a Wetland Management Plan and a more detailed landscape plan to be submitted at the subdivision stage.

### 3.2.4 Other Public Open Space Areas

The NEBSP contains several parklands which are provided in a site responsive manner to maximise the retention of existing trees where practicable, and take into account other site characteristics such as topography and equitable distribution based on the layout of key road linkages and street blocks.

These parkland areas contain a mix of passive and semi-active ('kickabout') recreational areas. The POS areas have been specifically designed to be co-located with bio-retention areas in the form of multiple use corridors, whilst maintaining sufficient 'dry' recreational areas outside of bio-retention basins, which will be available for year round use. The co-located bio-retention areas have been designed having regard to Better Urban Water Management principles, and are expected to be useable for the majority of times during the year with the exception of periods of heavy rainfall inundation.

Careful consideration has been given to the retention of existing significant trees within the linear POS areas, and to the interface between POS areas and abutting residential lots as illustrated in the accompanying landscaping cross sections.

## 3.3 Residential

### 3.3.1 Dwelling Type and Distribution

The NEBSP contemplates a mix of medium density housing ranging from Residential R25 to R40, with a base density code of R25. This is intended to facilitate the delivery of a wide range of housing types, which will provide for the diverse and changing needs of the community.

The NEBSP establishes higher densities adjacent to proposed areas of POS, which will offer high amenity outlooks for future dwellings and provide increased passive surveillance for the POS area and adjacent streets. The range in residential densities provided by the NEBSP facilitates a variety of housing styles

being provided across the NEBSP area. Single residential lots/dwellings, grouped housing, multiple dwellings and ancillary dwellings are all permissible within the ‘Residential’ zone under TPS 2.

### 3.3.2 Dwelling Yield and Density Estimates

As illustrated in the table below, areas identified for ‘Residential’ purposes in the NEBSP are estimated to yield approximately 830 dwellings. An indicative lot layout plan which illustrates the potential dwelling yield is provided in **Figure 8**. Based on these dwelling yield estimates, the NEBSP achieves an estimated residential density of approximately 15 dwellings per gross hectare of ‘Urban’ zoned land, and 25 dwellings per net hectare of residential developable land. This is calculated as follows:

**Table 9 – Residential Density Calculations**

Indicator	Amount
Gross SP area ( <i>all ‘Urban’ zoned land</i> )	59.11 hectares
Net SP area identified for ‘Residential’ purposes	32.89 hectares
Total estimated dwellings	830
Estimated Gross Residential Density ( <i>Dwellings / Gross SP area</i> )	15
Estimated Net Residential Density ( <i>Dwellings / Net Residential area</i> )	25

These estimated residential densities meet the various density targets set by the following regional and district level planning documents:

- **Directions 2031** – Sets a target of 15 dwellings per gross urban zoned hectare in new development areas.
- **Liveable Neighbourhoods (Element 1, R17)** – Recommends a minimum residential density of 20 to 30 dwellings per site hectare (net residential density) for areas within 400m of neighbourhood centres.

### 3.4 Movement Networks

A Transport Assessment (TA) has been specifically prepared to support the NEBSP. The TA and an associated addendum memorandum have been prepared by Cardno, and are provided in **Appendix 4**.

The TA has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Assessment Guidelines for Developments: Volume 2 – Structure Plans (2006)*.

Site access arrangements including the proposed internal road network, intersections to Baldvis Road, access to the primary school site, access to the commercially zoned site, and the adequacy of the internal road hierarchy have been assessed by the TA. This assessment has been undertaken having regard to existing weekday traffic volumes occurring on surrounding roads being Baldvis Road, Mundijong Road and Kulija Road as identified in Table 2-1 of TA.

Traffic flow forecasts based on the proposed road network of the structure plan area are provided in Section 6.1 of the TA.

The TA assesses and validates stopping and intersection sight distances contemplated in the NEBSP, and how this relates to intersection spacing along Baldivis Road. Egress capacity has also been considered regarding the ability of vehicles to exit from an access into a traffic stream.

The TA identifies that additional widening along Baldivis Road will be required at intersection locations to provide for turning pockets and passing.

Intersection layout and spacing proposed along Baldivis Road is considered sufficient both in terms of safe distances and egress capacity for vehicle movements, and will operate within acceptable capacity limits with the proposed development traffic.

The proposed internal road hierarchy is illustrated in Figure 5-2 of the TA. This diagram is supported by typical cross sectional details for road reserves based on their hierarchy classification. These cross sectional details are in line with the Commission's Liveable Neighbourhoods Policy.

It should be noted that road reserve widths associated with the road hierarchy classification are indicative only and would be discussed and agreed upon at the detailed design (subdivision) stage.

The outcomes of the TA indicate that the proposed development will not significantly impact the adjoining road network, will consist of a safe and effective internal road system, and has adequate access to regional cycling facilities. In this regard, an indicative path network plan illustrating the proposed future internal path network is provided in **Figure 9**.

Cardno undertook a further traffic analysis using new information in May 2017 for the intersection of Baldivis Road /Mundijong Road/Kulija Road and concluded that:

- The existing intersection currently operates at an acceptable level of service
- The existing intersection with the proposed development also operates at an acceptable level of service
- The intersection is expected to require upgrading within 17 years to cater for future growth of the area. (assuming full buildout of the proposed North Baldivis Structure Plan and a linear 2% growth rate).

### 3.5 Water Management

A Local Water Management Strategy (LWMS) has specifically been prepared to support the NEBSP. The LWMS has been prepared by RPS, and is provided in **Appendix 5**.

The LWMS details the integrated water management strategies to facilitate future urban water management planning. The LWMS will achieve integrated water management through the following design objectives:

- Effectively manage the risk to property damage and environmental degradation from water contamination, flooding and water logging;
- Maintain water quality (surface and groundwater) within the development in relation to pre-development water quality;
- Reduce potable water consumption within both public and private spaces through the use of practical and cost-effective measures;
- Promote infiltration of surface water to minimise the risk of further water quality degradation in the Peel Harvey Catchment;
- Implement best management practices in regards to stormwater management; and

- Incorporate where possible, low maintenance, cost-effective landscaping and stormwater treatment systems.

The LWMS provides that the drainage objectives for stormwater management will involve the following elements:

- Rainfall from 1 year 1 hr ARI (Annual Recurrence Interval) events (or 15 mm rainfall depth) will be retained and infiltrated as close to source as possible using soakwells, lot connection pits and biofiltration areas in each POS;
- Flood storage will primarily be provided within bioretention areas and conveyance swales that convey drainage to the Peel Main Drain;
- Stormwater entering each bioretention area will infiltrate into an underlying subsurface system that will discharge into a series of conveyance swales for additional treatment prior to off-site discharge;
- POS 1 located adjacent to the REW will provide biofiltration areas directly adjacent to the REW, with overtopping to the REW occurring in larger events (> 1year 1 hour ARI). This will ensure pre-development surface water flows to the REW are maintained whilst improving water quality to the wetland;
- Larger events (> 1year 1 hour ARI) will be detained in POS 2 to POS 7 and conveyed off site through a series of pipes and/or conveyance swales;
- Drainage from the northern catchment will be treated within a vegetated median swale system in Pug Road that includes underground piped storage, prior to any downstream outflow; and
- Outflow from the site will occur via four existing culverts, beneath the Kwinana Freeway to the east of the site, which ultimately deliver water to the PMD.

The same surface water management principles discussed above will be utilised in POS 1 directly adjacent to the REW, however the REW itself will be utilised to manage larger events in this location. This methodology is required in order to maintain the pre-development hydrological regime whilst improving water quality in this location generally.

In terms of water quality treatment, appropriate vegetation will be included in all biofiltration basins and substantial portions of the conveyance swales to help prevent erosion, maintain soil infiltration, restrict water flows and remove particulate and soluble pollutants, particularly nitrogen. Planting will occur within the bioretention areas of the basins over an area equivalent to at least 2% of the impervious road area.

The LWMS also identifies measures to control groundwater rise throughout the site whilst preventing any impacts on any ecological sensitive areas on site or nearby, including the REW at the south of the site and the PMD.

### 3.6 Education Facilities

As identified in the East Baldivis DSP, the provision of a primary school site is required to service the northern portion of the DSP cell bounded by Millar Road, Kwinana Freeway, Mundijong Road, and Baldivis Road. The DSP contemplates the land requirement for the primary school site being shared on a 50/50 basis with Lot 459 to the north of the subject site.

The NEBSP makes provision for a 3.5 hectare primary school site co-located with local open space in accordance with the Department of Education's Primary School Site Planning Criteria completely within the structure plan area.

Consultation has been undertaken with the Department of Education with respect to the location of the primary school site relative to the proposed internal road network, and the proposed size and configuration of the school site relative to the structure plan area.

It is noted that the proposed location of the primary school site differs from the location contemplated in the East Baldivis DSP insofar as the proposed school site is situated within a more centralised portion of the NEBSP area relative to the surrounding catchment as opposed to the western portion.

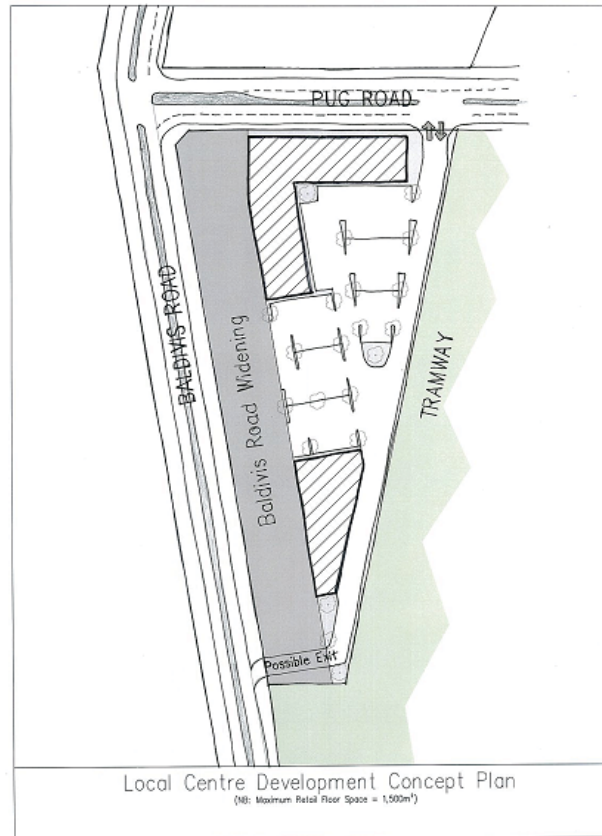
The following justifications are provided with respect to the proposed location of the primary school site:

- The site is better situated relative to the surrounding catchment and remains more centralised to its catchment having regard to the proposed road network;
- Regular configuration of the site has been maintained;
- Road access to the school site is optimised with regard to the Department of Education site planning criteria;
- The location allows for higher amenity lots to be created in closer proximity to the tramway reserve taking advantage of the amenity values offered by the tramway;
- The proposal enables the status quo to be maintained for Pug Road in terms of continuity of access from Pug Road through to Baldivis Road, negating the need to undertake any road closure of Pug Road at its interface with Baldivis Road;
- More equitable distribution of POS within the adjoining structure plan areas is achieved through the school site oval being situated centrally relative to the future structure plan to be prepared to the north of the subject site;
- There is no substantive benefit having school site POS abutting tramway and it reduces surveillance opportunities that could be achieved by having development adjoining/overlooking tramway;
- Having the tramway abutting the development will increase opportunities for residents to use and care for tramway; and
- A larger oval can be provided with the site being situated more centrally within the structure plan area as opposed to adjacent to the tramway.

The proposed location of the primary school site is supported by the Department of Education noting that all features of the site are consistent with the Department of Education's site planning criteria.

### 3.7 Activity Centres and Employment

An Economic and Employment Assessment (EEA) has specifically been undertaken to support the NEBSP. The EEA has been prepared by Martinus Consulting, and is provided in **Appendix 6**.



### **Indicative Concept Plan – Commercial Zone**

The NEBSP proposes the 0.6572 hectare portion of Lot 460 being assigned with a Commercial zone. The location of the proposed local centre is considered ideal as it will not only be serviced by the ultimate catchment of the resident population in the greater East Baldvis locality, but will also potentially capture significant passing trade using Baldvis Road. On this basis, the total catchment of this centre is considered capable of capturing sufficient patronage to sustain a local/mixed used centre with floor space of up to 1500sqm NLA.

Such business that may be attracted to the site might include services such as accountancy, barristers and solicitors, training specialists, people services/business coaching, personal training and/or health and wellness coaches, independent book publishing – eBooks and website development, property development consultants and the like.

North Baldvis is strategically located for residents and businesses to take advantage of a number of regional infrastructure opportunities including the Baldvis Library and Community Centre, Baldvis District Sporting Complex (expected completion 2017-2018), and the Baldvis Town Centre.

These significant regional infrastructure features will attract households of the mindset that they can contribute to, and make a living from, the economic activity of the area. Investment in provisioning infrastructure as residential and commercial lots are readied for market will promote the viability of the neighbourhood centre and the 'liveability' of North Baldvis.

A significant amount of work has been detailed in the most recent City of Rockingham Economic Development Strategy that makes mention of recent major development approvals that impact the Baldvis Activity Centre and the secondary economic consequences.

The major additions and alterations to the Baldivis Shopping Centre will mean that proximity to this centre will enhance the viability of micro and small business activity in North Baldivis.

Notwithstanding that development of the structure plan area will predominantly be for residential purposes, it will contribute to regional Rockingham in a number of ways, including:

- Creation of over 700 direct and indirect jobs within the infrastructure provisioning, construction and operational stages;
- Use of strategic location and road network to provide trip-linking possibilities which will greatly enhance commercial and business opportunities; and
- Integrate directly into the aspirational statement of local job creation and self sufficiency in the City of Rockingham Economic Development Strategy 2014-2017.

Ultimately, the EEA recognises that by creating opportunities for local enterprises to occur, the provision of essential infrastructure that will be required to service the NEBSP area can be optimised. Additionally, the creation of lasting and diverse employment and investment opportunities within a defined area is consistent with the City's Economic Development Strategy, and more broadly is consistent with the employment and sustainability objectives identified in Directions 2031.



## 3.8 Infrastructure Coordination, Servicing and Staging

### 3.8.1 Infrastructure Coordination and Servicing

An Engineering Infrastructure Report (EIR) has specifically been prepared to support the NEBSP. The EIR has been prepared by TABEC, and is provided in **Appendix 7**.

This EIR provides a broad range of advice with respect to servicing and infrastructure as it relates to the NEBSP area.

This EIR has been based on the civil engineering aspects of residential related land uses and summarises the availability of existing infrastructure assets in proximity to the landholding and the potential engineering infrastructure requirements to support urban development within the subject site.

The information provided in the EIR is preliminary and subject to change as the development process proceeds and more information and detail becomes available from the various service authorities.

#### 3.8.1.1 Earthworks

Based on detailed geotechnical investigations, the subject site will require filling of between 0.7 metres to 1.7 metres of sand fill to achieve adequate separation distance from the 1 in 100 year flood level, with Class A sites being achievable across the majority of the NEBSP area. An indicative lot levels plan which illustrates the future finished lot levels is provided in **Figure 10**.

#### 3.8.1.2 Surrounding Road Network

Access to the NEBSP area is available from Baldvis Road to the immediate west which is a local road vested in the City of Rockingham.

The NEBSP plan proposes a single intersection to be constructed onto Baldvis Road across the Tramway reserve. Access from Pug Road, which is an existing unmade road to the north, will also be available. Direct access from Mundijong Road to the south is not possible.

Mundijong Road has recently been upgraded and extended through to Mandurah Road. An un-signalised staggered T-intersection at Baldvis Road has been constructed with Mundijong Road as the priority route. Levels at the intersection have been raised from the natural surface by approximately 6 metres. Baldvis Road therefore ramps up to the intersection over a length of approximately 300+ metres. The alignment of Baldvis Road (north) now varies and occupies part of the Tramway reserve to suit the staggered T-intersection design.

Baldvis Road in its current state is a two lane undivided rural road with an 80km/hr speed limit. Intersections onto Baldvis Road will need to cater for the ultimate Baldvis Road configuration, which contemplates the widening of Baldvis Road and the construction of a 5 metre pavement width in each direction.

#### 3.8.1.3 Stormwater Drainage

The EIR describes the location of the subject site relative to the Peel-Harvey catchment, noting that surface stormwater collected on site grades toward the Peel Main Drain (PMD) and drains through existing irrigation channels in an easterly direction through 4 adjacent culverts.

A constraint for the stormwater disposal is the low lying nature of the site with a high groundwater table and that a significant portion of the site contains clayey material. Consequently, infiltration on site has required

detailed consideration. Discharge of stormwater water through the Freeway culverts is possible, however the flow rate is restricted to a maximum permissible outflow of 4.5L/s/ha.

The EIR notes that the design of drainage facilities will consider the site conditions including the capacity for stormwater infiltration and conveyance of stormwater runoff via the road network to a conventional pit and pipe drainage network, with discharge into public open space areas where drainage basins and facilities will be located. The EIR also notes that the Baldvis Tramway Reserve will not be impacted by stormwater drainage runoff, and an outlet will be provided to ensure no ponding occurs within the tramway reserve. Additionally, a free outfall will be maintained with subsoil drainage outlets with these outlets being maintained 300mm above the culverts within the adjoining freeway reserve.

Drainage management measures have been identified through the Local Water Management Strategy prepared by RPS, which is provided in **Appendix 5** and described in further detail in both the EIR and the LWMS.

#### 3.8.1.4 Wastewater

It is noted that the Water Corporation has no permanent waste water outlet available to the subject site as the site falls into the catchment of the East Rockingham Waste Water Treatment Plant (ERWWTP) which is yet to become operational. To allow development to proceed, various interim solutions have been investigated and are described in further detail in the EIR.

Temporary discharge of waste water has been agreed to by the Water Corporation, subject to necessary upgrades at the existing receiving waste water pump station (WWPS). A plan illustrating the indicative location of the WWPS is provided in **Figure 11**.

Landholdings between Mundijong Road and Millar Road will ultimately be served via a Type 40 waste water pump station located in Lot 460 which is central to the catchment, necessitating the construction of pressure mains.

The EIR describes temporary conveyance solutions in the context of Water Corporation's planning and funding priorities, and notes the ultimate wastewater flows will be directed toward the ERWWTP.

It will be necessary for the WWPS to be constructed in the first stage of development, with a deep gravity sewer main being directed to the WWPS location. The exact WWPS location remains to be determined. However, as planning progresses, the nominated WWPS site will form part of the subdivision plan, subject to Water Corporation acceptance.

The development will be served via a gravity fed network of varying sized sewer pipes designed in accordance with the Water Corporation specifications.

In summary, a viable solution for the interim and ultimate wastewater servicing of the NEBSP area exists, and is acceptable to the Water Corporation.

#### 3.8.1.5 Water Supply

In response to updated Planning Framework in the South Metropolitan Peel sub-region, Water Corporation is currently in the process of revising and updating the water servicing planning for the area that appropriately addresses intended development. The previous strategy has been revised due to planning updates to the east of the Kwinana Freeway.

The Water Corporation is currently reviewing both long term strategies and short term solutions to enable the first stages of development to proceed at North Baldvis. TABEC and Cedar Woods Properties have been in

regular contact with the Water Corporation over the last 6 months to ensure this is tailored to the development time frame and rate of residential lot production.

An interim water servicing measure is likely to require a water distribution main being constructed from Fifty Road to Pug Road, and smaller reticulation water mains only being constructed to the north of Pug Road. A thorough review of this infrastructure has been required due to the NEBSP area being situated across two reticulation scheme boundaries. This will also ensure the North Baldvis planning advice will adequately address other developments on Baldvis Road which are intended to commence in 2016. It is anticipated that an agreement for contributions from other developers will be sought for the practical implementation of water mains to suit Water Corporation's requirements.

#### 3.8.1.6 Power Supply

Existing Western Power overhead lines abut the subject site along Baldvis Road.

The EIR describes the location of nearby zone substations, and anticipates that no high voltage reinforcements will be required to supply the initial stages of the NEBSP.

Further upgrades of the network will be required when the existing network reaches capacity. The requirement and timing of these upgrades is dependent on the load growth of the subject site and surrounding developments.

Works within the subject site to service the ultimate load demand will include transformers and associated infrastructure as required by the staging of the development. There may also be a requirement to relocate existing overhead aerial transmission lines underground on the boundary of the subject site.

In summary, electrical supply will be available to service the NEBSP.

#### 3.8.1.7 Telecommunications

NBN Co is responsible for the installation of optic fibre in all broad acre developments of 100 or more dwellings, within the long term optic fibre footprint, to which the NEBSP area will qualify. The developer will be responsible for providing pit and pipe infrastructure throughout the future subdivision for the optic fibre to be installed. Ultimately, there are no impediments to the supply of telecommunication infrastructure to service the subject site.

#### 3.8.1.8 Gas Supply

An existing high pressure gas main is situated approximately 1.9km to the south of the proposed southern entry road to the NEBSP area.

ATCO Gas has confirmed the headworks required to provide services to the future subdivision which is illustrated in the EIR. The extension of the existing gas main will require significant construction costs. It has been confirmed that ATCO Gas would contribute the vast majority of this cost for these headworks, although a contribution would be sought from the developer to provide the infrastructure from which internal reticulation will be laid.

An internal gas supply will be provided to each lot through common trenching at no additional cost to the project.

### 3.8.2 Staging

There is no formal infrastructure coordination or staging arrangements proposed in the NEBSP, owing to the limited number of properties affected, the consolidated nature of the land tenure as being wholly owned subsidiaries of Cedar Woods Properties Ltd, and relatively straightforward approach to the provision of infrastructure and POS. A development staging plan illustrating potential staging of subdivision within the structure plan is provided in **Figure 12**.

It is noted that the proposed WWPS, pressure main and water trunk services identified in Section 4.4 are being planned with, and will be funded entirely by the proponent.

### 3.9 Developer Contribution Arrangements

The NEBSP area is located within Development Area 40 (DA 40) as identified in Schedule 9 of TPS 2. No specific developer contributions are identified as being applicable to the DA 40 area, nor has the subject site been identified in Schedule 10 – Developer Contribution Areas in TPS 2. In this regard, the NEBSP, and more broadly, the East Baldivis DSP is a largely self contained “cell” with infrastructure and services being funded entirely by the developers without the need for an overarching developer contribution framework.

The NEBSP area also falls within the Development Contribution Scheme No. 2 – Community Infrastructure, and infrastructure contributions in this regard will apply at the subdivision stage.

### 3.10 Other Requirements

#### 3.10.1 Local Development Plans

To further guide and control development within the NEBSP area, Local Development Plans (LDP) will be prepared in the following instances:

- For residential lots provided with vehicular access via a rear laneway;
- For residential lots abutting proposed Parks and Recreation reserves;
- For lots deemed to be affected by a recognised Bush Fire Hazard;
- For lots deemed to be affected by transportation noise; and
- For the land zoned as Commercial in the structure plan map.

LDPs may be prepared as part of a subdivision application or imposed as a condition of subdivision approval.

Matters to be addressed by LDPs for residential lots generally include:

- Built form outcomes, including setbacks, garage locations and open space provision;
- POS and private lot/dwelling interface, ensuring adequate surveillance of POS;
- Appropriate separation of public and private space;
- Orientation and design of homes to address solar orientation principles; and
- On-street and off-street parking provision.

## 4.0 Conclusion

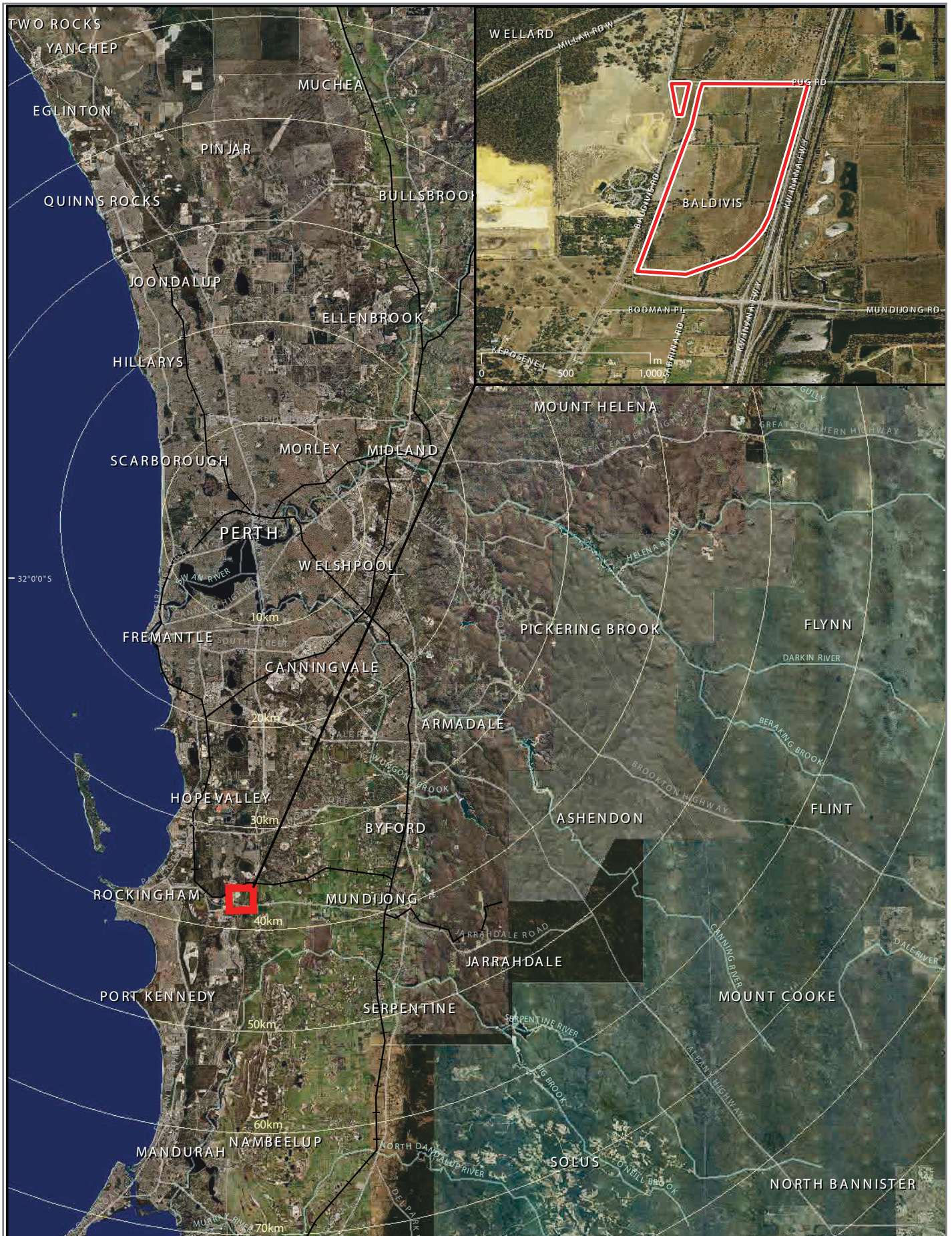
The purpose of this Structure Plan is to facilitate the future subdivision and development of the subject site, and to provide a range of housing types and densities that will assist in diversifying the existing housing stock within the City of Rockingham.

This Structure Plan has been prepared in accordance with the design requirements outlined in Liveable Neighbourhoods, and responds to requirements outlined in the City of Rockingham TPS 2.

The design of the Structure Plan is based on best-practice urban design principles, including housing choice/diversity, climatic responsiveness, sustainable urban water management, conservation of environmental assets (e.g. RE wetland), and the provision of a safe and efficient movement network.

The Structure Plan provides for the efficient and orderly development of planned residential land, and provides an appropriate and attractive interface between planned urban developments to the north and south.

# FIGURES

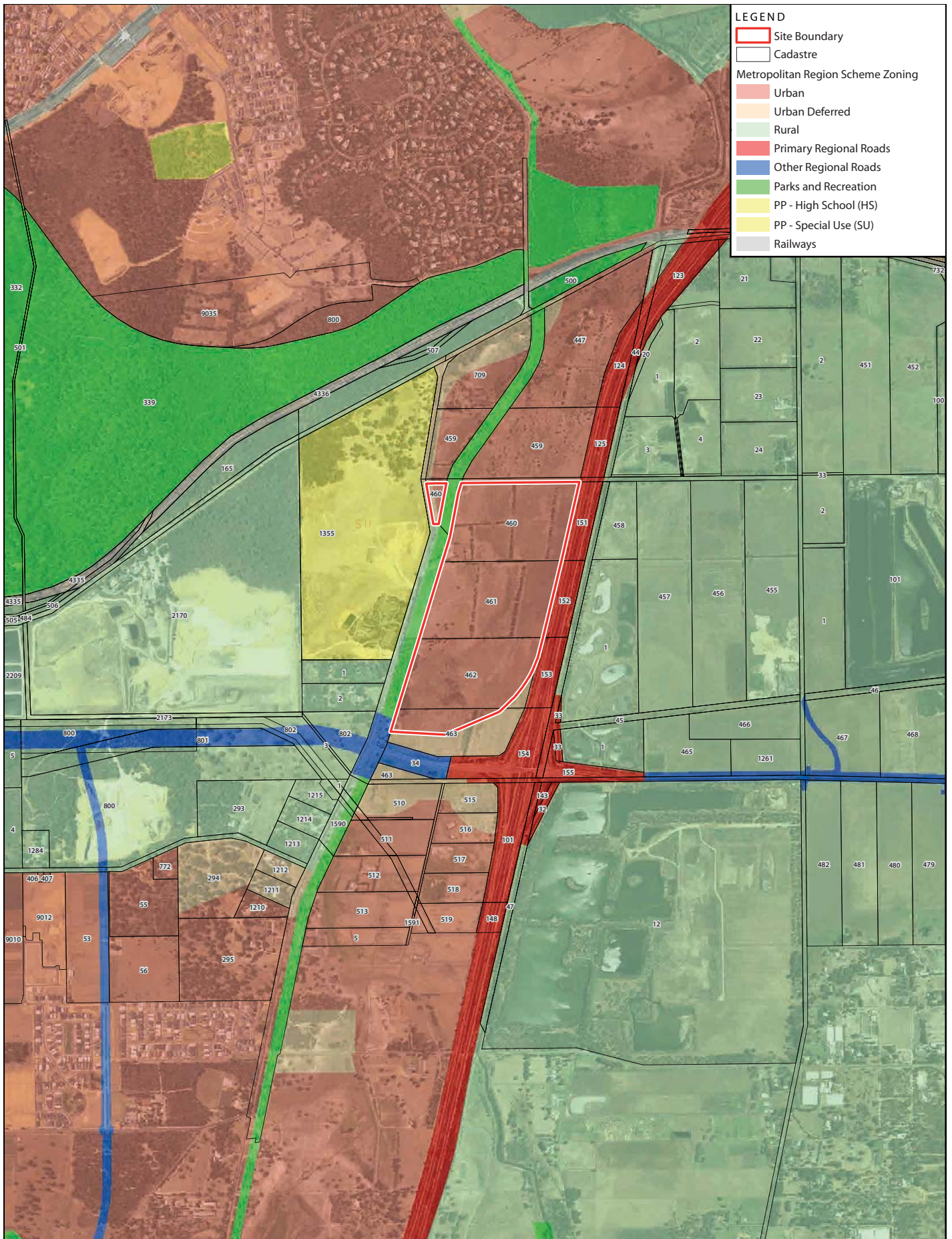


**NORTH BALDIVIS**  
 Site Location  
 Figure 1

0 250 500

**RPS**  
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**LEGEND**

- Site Boundary
- Cadastre
- Metropolitan Region Scheme Zoning**
- Urban
- Urban Deferred
- Rural
- Primary Regional Roads
- Other Regional Roads
- Parks and Recreation
- PP - High School (HS)
- PP - Special Use (SU)
- Railways



**NORTH BALDIVIS**  
Metropolitan Region Scheme  
Figure 2

**RPS**

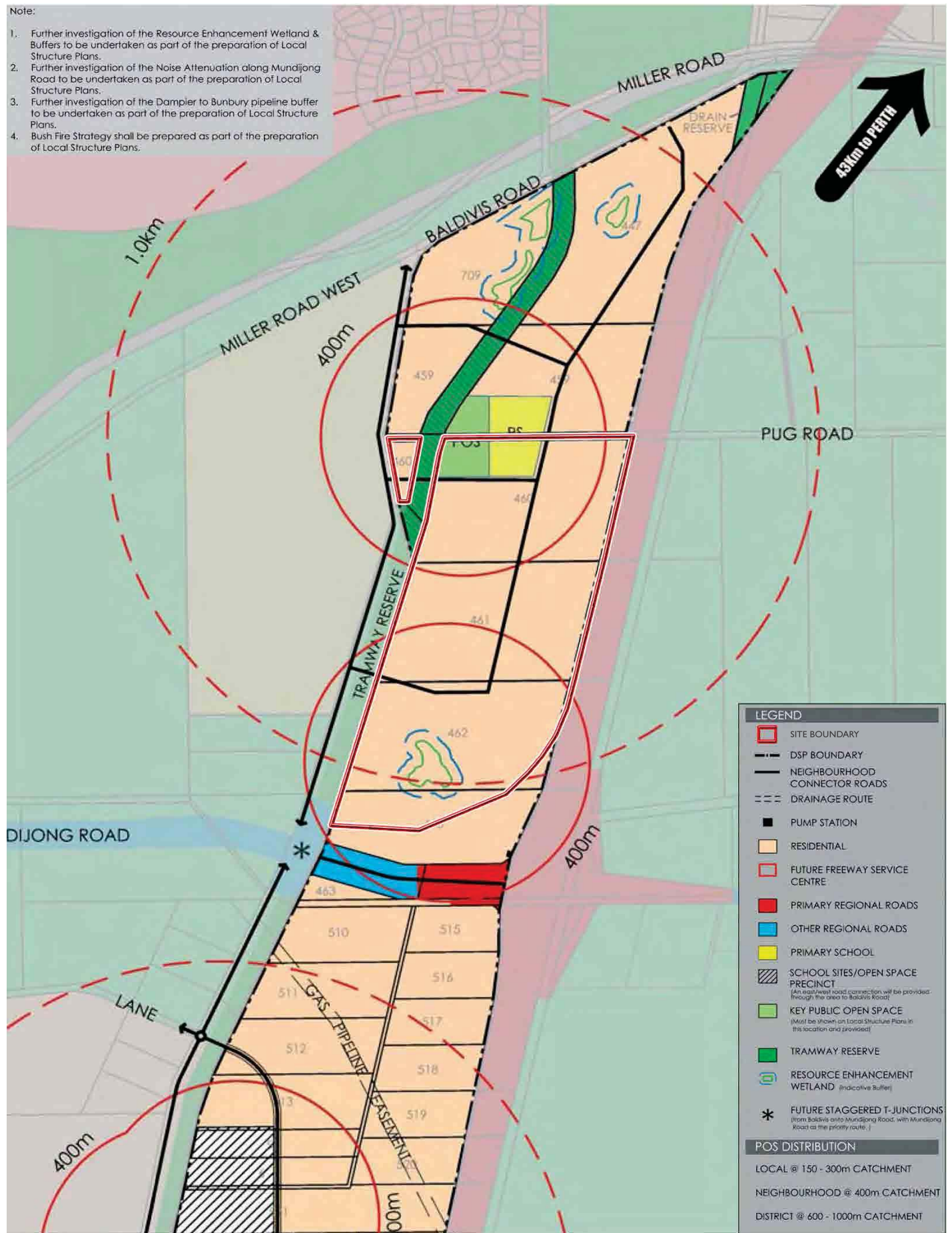
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Note:

1. Further investigation of the Resource Enhancement Wetland & Buffers to be undertaken as part of the preparation of Local Structure Plans.
2. Further investigation of the Noise Attenuation along Mundijong Road to be undertaken as part of the preparation of Local Structure Plans.
3. Further investigation of the Dampier to Bunbury pipeline buffer to be undertaken as part of the preparation of Local Structure Plans.
4. Bush Fire Strategy shall be prepared as part of the preparation of Local Structure Plans.



**LEGEND**

- SITE BOUNDARY
- DSP BOUNDARY
- NEIGHBOURHOOD CONNECTOR ROADS
- DRAINAGE ROUTE
- PUMP STATION
- RESIDENTIAL
- FUTURE FREEWAY SERVICE CENTRE
- PRIMARY REGIONAL ROADS
- OTHER REGIONAL ROADS
- PRIMARY SCHOOL
- SCHOOL SITES/OPEN SPACE PRECINCT  
(An east-west road connection will be provided through the road to Baldvis Road)
- KEY PUBLIC OPEN SPACE  
(Must be shown on Local Structure Plans in this location and provided)
- TRAMWAY RESERVE
- RESOURCE ENHANCEMENT WETLAND  
(Indicative Buffer)
- \* FUTURE STAGGERED T-JUNCTIONS  
(From Baldvis into Mundijong Road, with Mundijong Road as the priority route.)

**POS DISTRIBUTION**

- LOCAL @ 150 - 300m CATCHMENT
- NEIGHBOURHOOD @ 400m CATCHMENT
- DISTRICT @ 600 - 1000m CATCHMENT

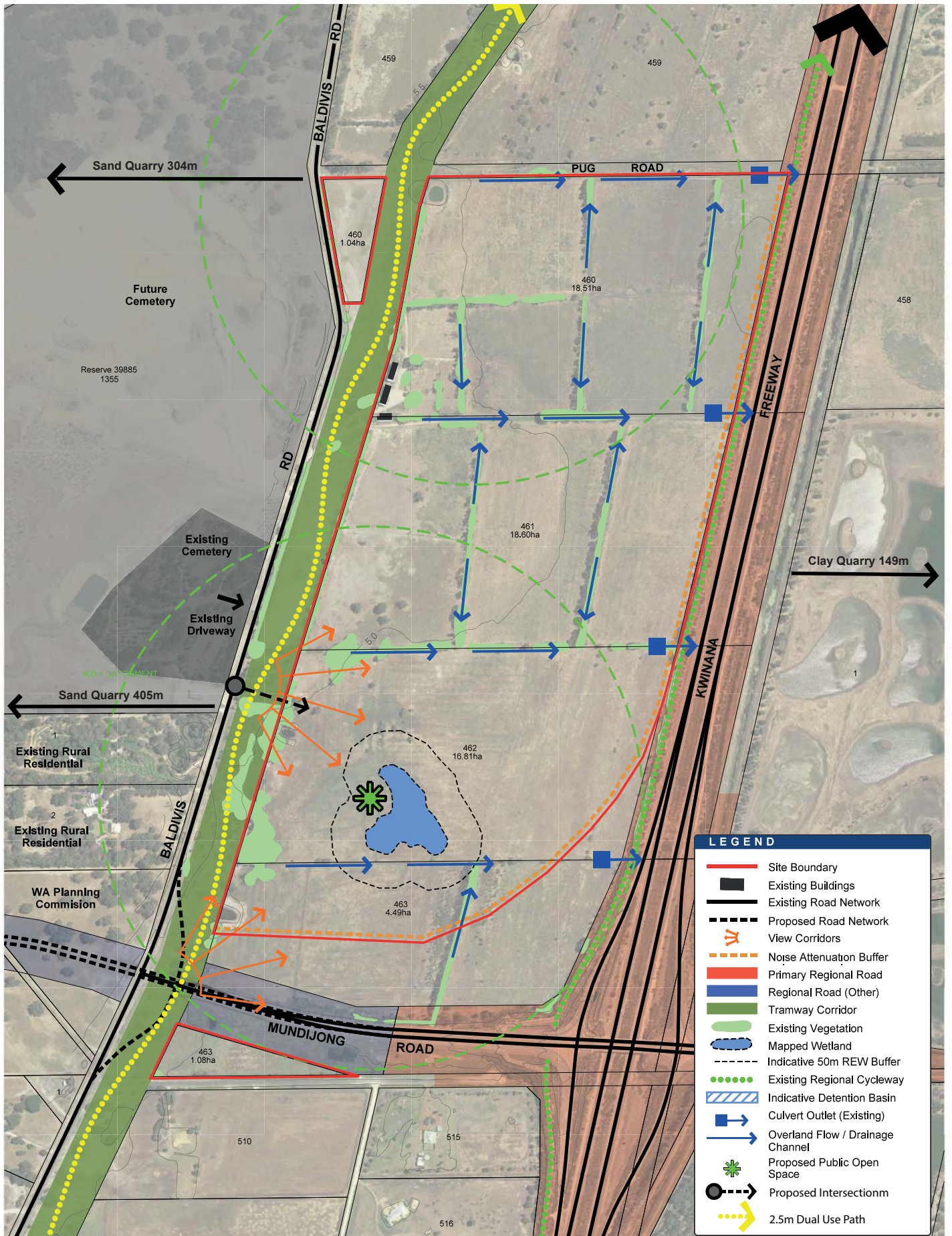


**NORTH BALDIS**  
East Baldvis District Structure Plan  
Figure 3



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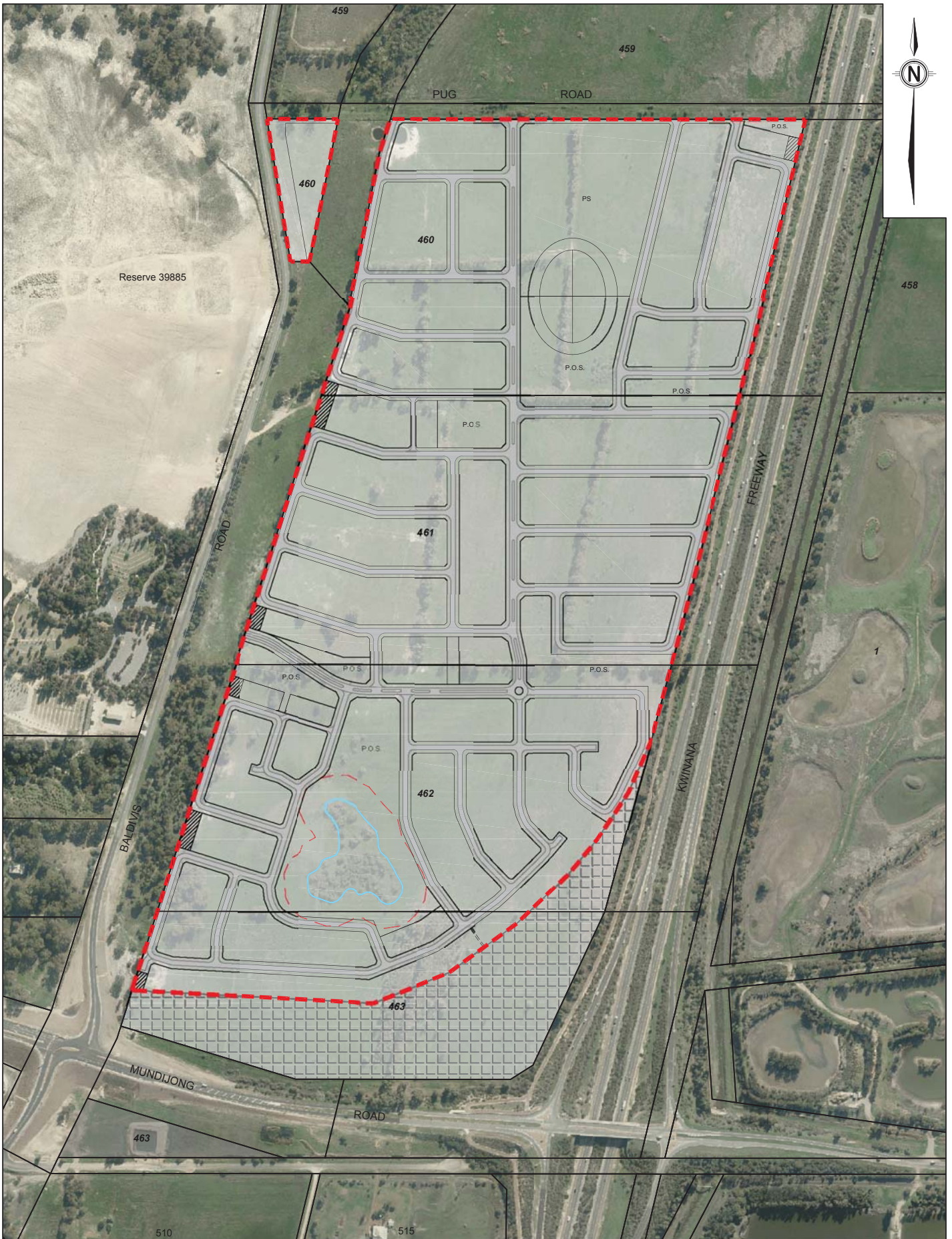


LEGEND	
	Site Boundary
	Existing Buildings
	Existing Road Network
	Proposed Road Network
	View Corridors
	Noise Attenuation Buffer
	Primary Regional Road
	Regional Road (Other)
	Tramway Corridor
	Existing Vegetation
	Mapped Wetland
	Indicative 50m REW Buffer
	Existing Regional Cycleway
	Indicative Detention Basin
	Culvert Outlet (Existing)
	Overland Flow / Drainage Channel
	Proposed Public Open Space
	Proposed Intersection
	2.5m Dual Use Path



**NORTH BALDIVIS**  
Opportunities and Constraints  
Figure 4

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**NORTH BALDIVIS**  
Structure Plan - Aerial Overlay  
Figure 5

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NORTH BALDIVIS  
 PREPARED FOR CEDAR WOODS

LANDSCAPE MASTERPLAN

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JAN 2017



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NORTH BALDIVIS - POS 2  
 PREPARED FOR CEDAR WOODS  
 LANDSCAPE CONCEPT PLAN



SECTION B-B  
POS 2



SECTION C-C  
POS 2

NORTH BALDIVIS - POS 2  
PREPARED FOR CEDAR WOODS

LANDSCAPE CONCEPT SECTION B-B & C-C

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EXISTING VEGETATION TO BE RETAINED & PROTECTED WHERE POSSIBLE AND APPROPRIATE. EXISTING TREES TO BE ASSESSED BY ARBORIST PRIOR TO FINAL DETERMINATION.

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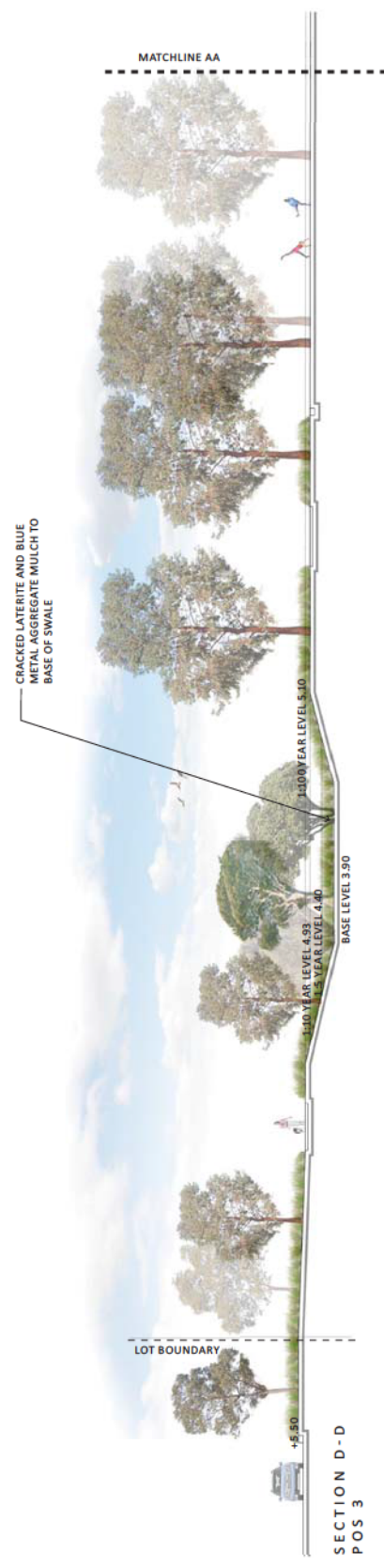


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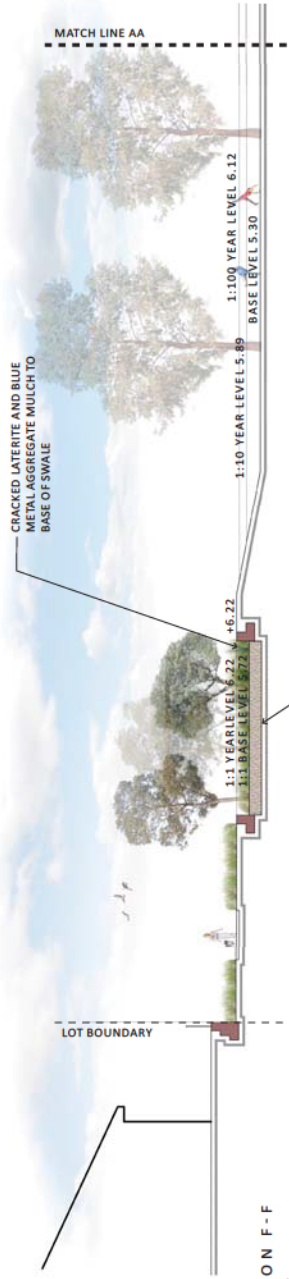


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DEC 2016



SECTION F - F  
POS 4

CRACKED LATERITE AND BLUE METAL AGGREGATE MULCH TO BASE OF SWALE



SECTION G - G  
POS 4

CRACKED LATERITE AND BLUE METAL AGGREGATE MULCH TO BASE OF SWALE





SHADE STRUCTURE WITH BBQ OVERLOOKING TURF KICK-ABOUT & BASIN

DRAINAGE BASIN PLANTED WITH NATIVE REEDS, SEDGES AND TREES

FITNESS CIRCUIT WITH VARIOUS OUTDOOR EQUIPMENT ON SOFTFALL

TURF  
1:100 YR DRAINAGE OVERFLOW

1:1 YR BASIN

TURF

EXISTING VEGETATION TO BE RETAINED & PROTECTED WHERE POSSIBLE AND APPROPRIATE. EXISTING TREES TO BE ASSESSED BY ARBORIST PRIOR TO FINAL DETERMINATION

1:5/1:10/1:100 CONVEYANCE SWALE SIDESLOPES AT 1:4 GRADE

EXTENT OF SITE



SECTION H-H  
POS 5

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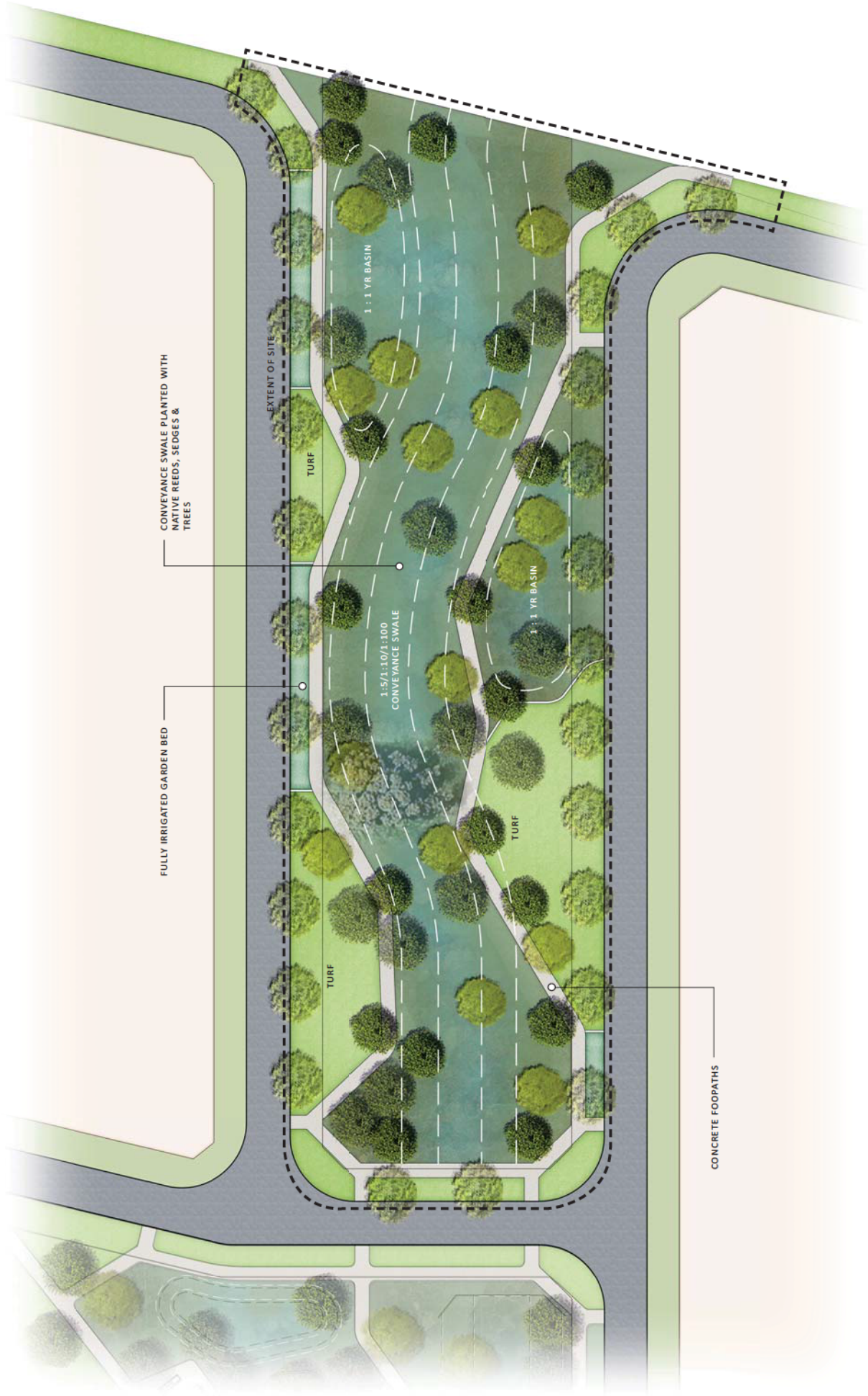
DEC 2016

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NORTH BALDIVIS - POS 6  
PREPARED FOR CEDAR WOODS  
LANDSCAPE CONCEPT PLAN



CONVEYANCE SWALE PLANTED WITH  
NATIVE REEDS, SEDGES &  
TREES

FULLY IRRIGATED GARDEN BED

EXTENT OF SITE

TURF

1 : 1 YR BASIN

1.5:1.0:1.100  
CONVEYANCE SWALE

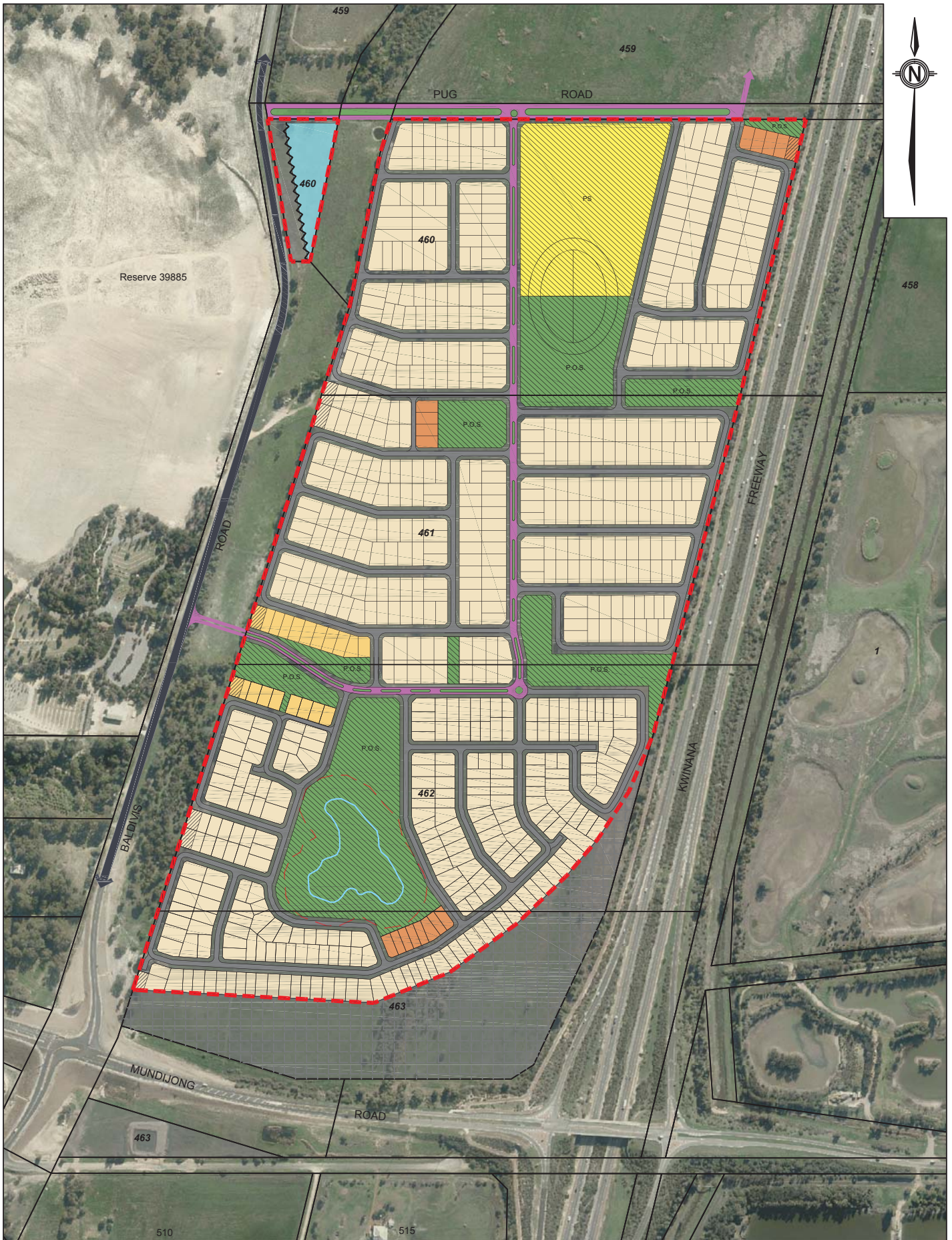
TURF

1 : 1 YR BASIN

CONCRETE FOOTPATHS



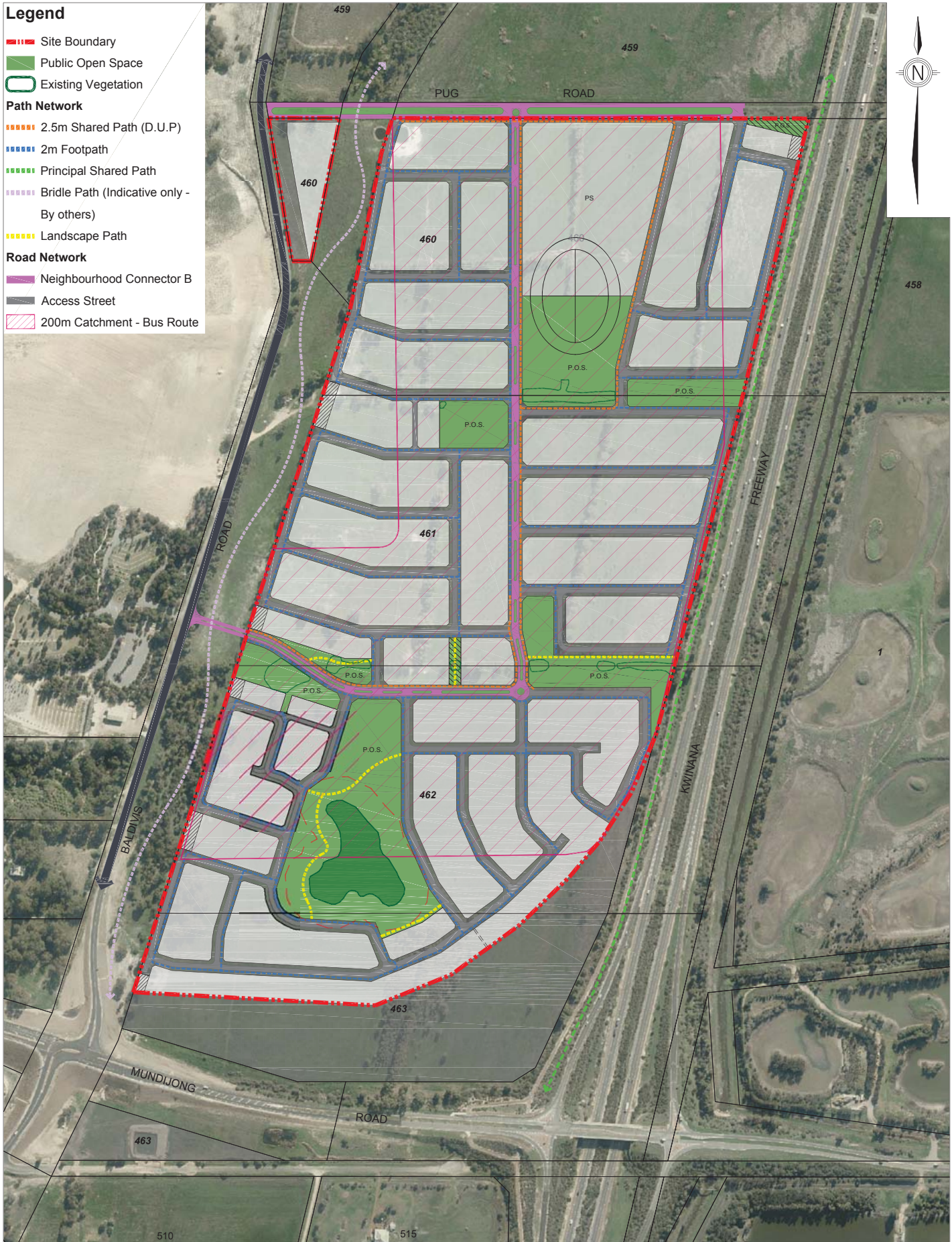




**NORTH BALDIVIS**  
 Lot Layout  
 Figure 8

**RPS** Australia East Pty Ltd  
 ACN 140 292 762  
 ABN 44 140 292 762  
 Level 22/270 Park Street  
 West Perth, WA, Australia 6005  
 PO Box 170, West Perth WA 6005  
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 T +61 8 9211 1111  
 F +61 8 9211 1122  
 W rpsgroup.com.au

- Legend**
- ▬▬▬ Site Boundary
  - ▬▬▬ Public Open Space
  - Existing Vegetation
  - Path Network**
  - ▬▬▬▬▬ 2.5m Shared Path (D.U.P)
  - ▬▬▬▬▬ 2m Footpath
  - ▬▬▬▬▬ Principal Shared Path
  - ▬▬▬▬▬ Bridle Path (Indicative only - By others)
  - ▬▬▬▬▬ Landscape Path
  - Road Network**
  - ▬▬▬▬▬ Neighbourhood Connector B
  - ▬▬▬▬▬ Access Street
  - ▬▬▬▬▬ 200m Catchment - Bus Route

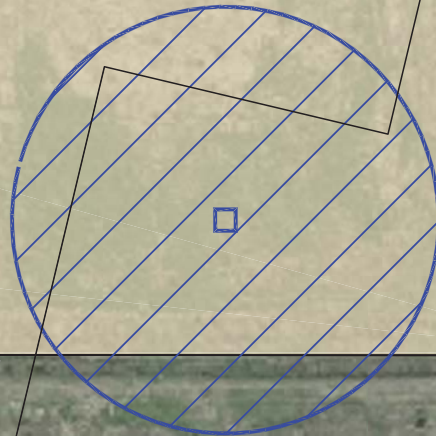






FUTURE DEVELOPMENT

FUTURE P.O.S.





PUG ROAD

P.O.S.

PRIMARY SCHOOL

KWINANA FREEWAY

**Legend**

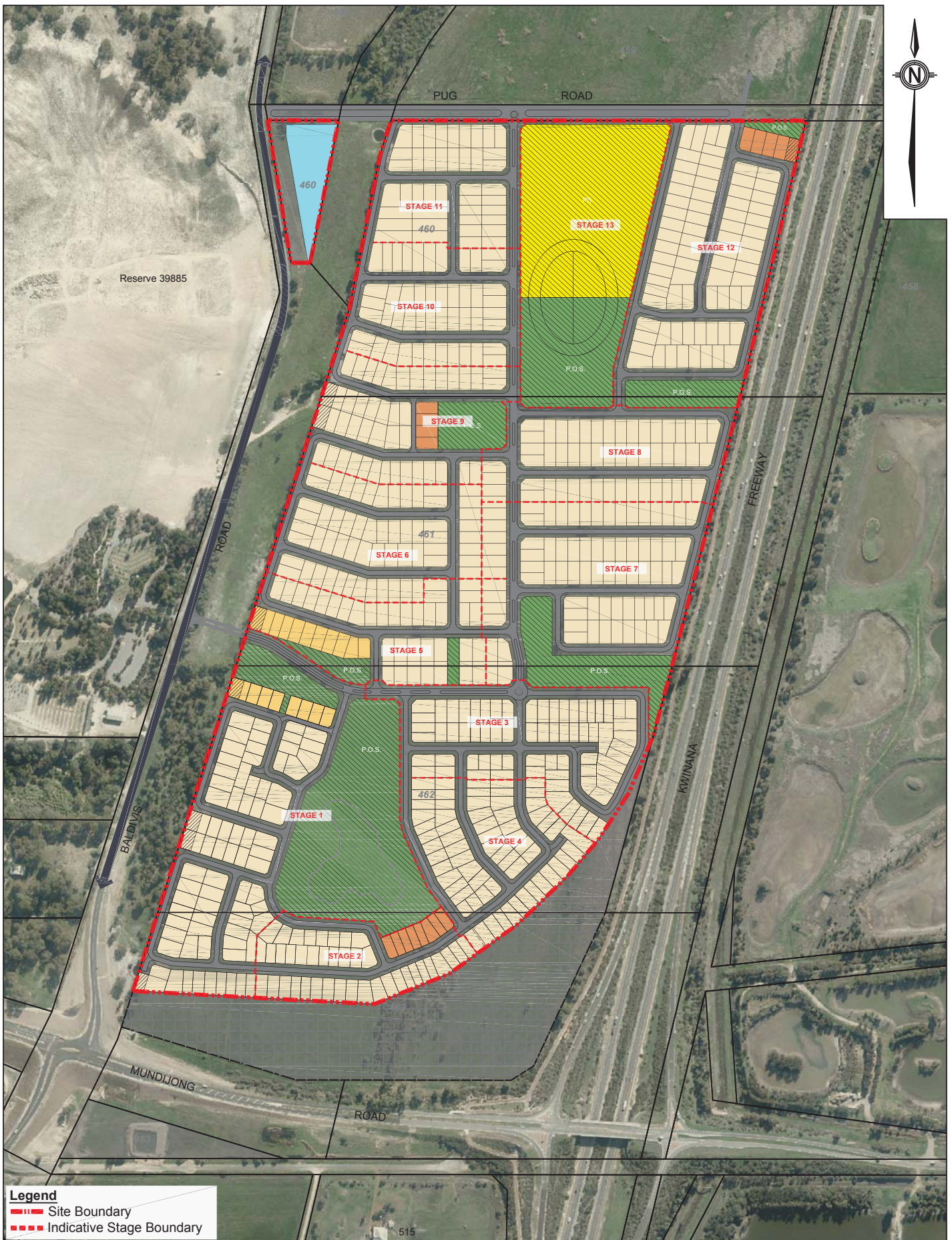
-  Type 40 (WWPS) (Indicative Location)
-  30m Buffer



**NORTH BALDIVIS**  
Waste Water Pump Station Location  
Figure 11

**RPS**  
RPS Australia East Pty Ltd  
ACN 140 292 762  
ABN 44 140 292 762  
Unit 22/2700 South Street  
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**Legend**  
 - - - Site Boundary  
 - - - Indicative Stage Boundary



**NORTH BALDIVIS**  
 Development Staging Plan  
 Figure 12

**RPS**  
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