

A detailed cadastral map of Lot 306 McDonald Road, Baldivis. The map shows a complex network of streets, including a central road that curves around a large, irregularly shaped area. This central area contains several smaller, circular or oval-shaped features, possibly representing ponds or landscaped areas. The surrounding land is divided into numerous rectangular lots, many of which are numbered. The map is drawn in a light brown or tan color on a white background.

# PART TWO

## Explanatory Section

### PORTION OF LOT 306 MCDONALD ROAD, BALDIVIS STRUCTURE PLAN

1. Planning Background
2. Statutory, Strategic and Policy Considerations
3. Site Constraints
4. Context Analysis
5. Structure Plan
6. Infrastructure Co-ordination and Servicing
7. Implementation

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# 1 PLANNING BACKGROUND

## 1.1 Introduction & Purpose

The purpose of this Structure Plan is to provide a basis for zoning (including residential density) and subdivision of land of portion of Lot 306 McDonald Road (the subject land) zoned 'Urban' under the Metropolitan Region Scheme. The Structure Plan identifies the pattern of development by depicting specific matters such as the location of roads, residential densities, public reserves and pedestrian/cycle networks.

## 1.2 Land Description

### 1.2.1 Location

The Structure Plan area is located approximately 12km east of the Rockingham Town Centre, and 43km south of the Perth Central Business District. The Kwinana Freeway lies approximately 2km east of the subject land and can be accessed via Mundijong Road (refer **Figure 1**).

The subject land is generally bound by McDonald Road to the east, Fifty Road to the south, the future 'Paradiso Estate' to the north and other privately owned allotments to the west.

### 1.2.2 Ownership, Area and Legal Description

The Structure Plan area comprises northern portion of Lot 306, zoned 'Urban' under the MRS. The parent Lot 306 is 18.18ha in area, of which 13.115ha is the subject of this Structure Plan. Land ownership details are provided in **Table 1**.

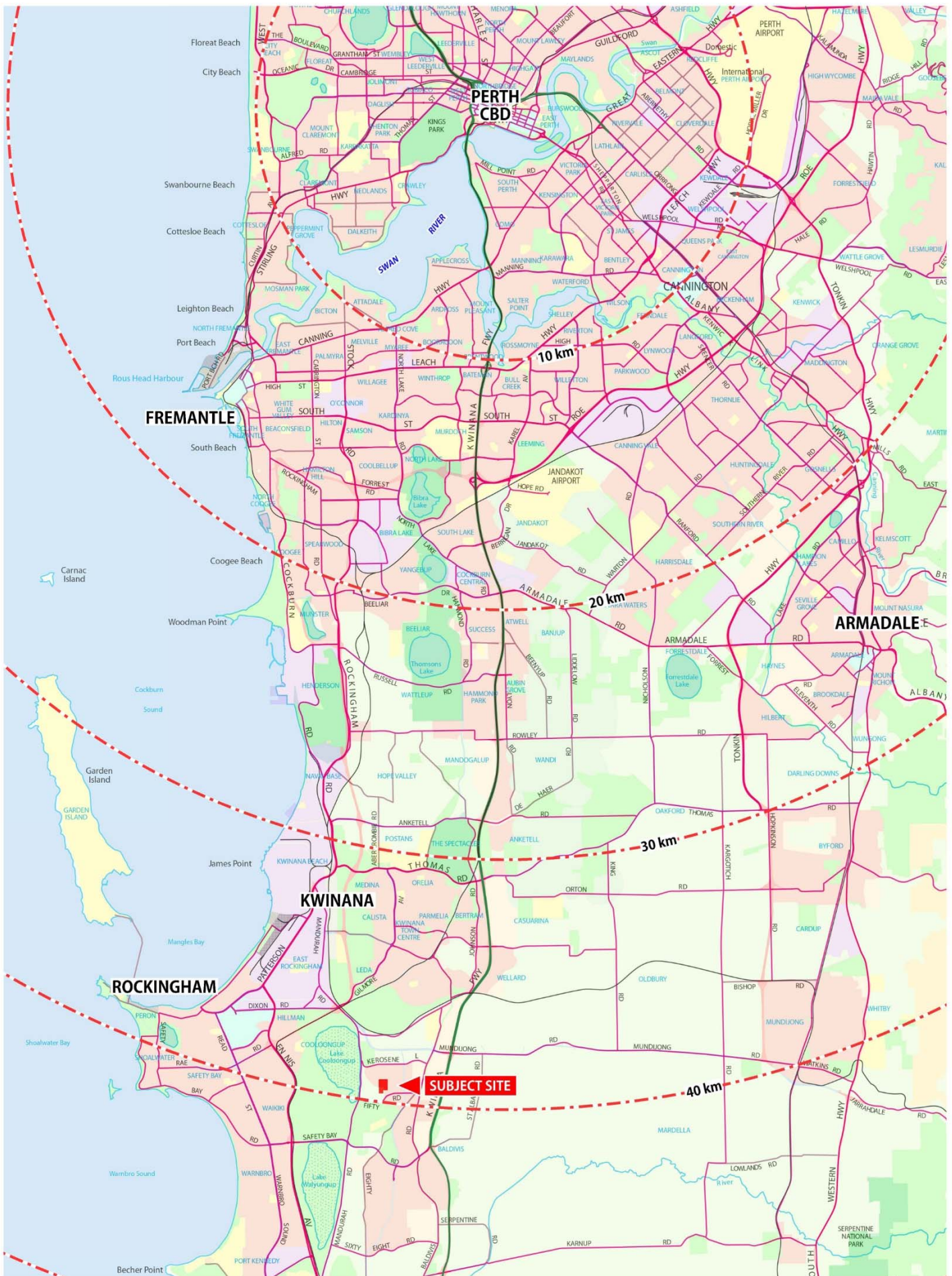
**Table 1: Land Ownership Details**

Lot Number	Owner	Certificate of Title	Area (Ha)
306	Carcione Nominees Pty Ltd in 99/100 share Mainday Holdings Pty Ltd in 1/100 share	1955/394	18.18
Total Area			18.18

The relevant Certificate of Title is attached in **Appendix 1**.

### 1.2.3 Land Use

The Structure Plan area is predominately cleared of vegetation as it was previously used for market gardens. Original 'homesteads' and associated outbuildings can be found on the south-east portion of the site; these are not intended to be retained. Furthermore, the Parmelia Gas Pipeline runs through the western portion of the site.



## LOCATION PLAN

Figure 1



Not to Scale@A4 Date: 11/11/2015 Plan: SPGBD-5-003A



## 2 STATUTORY, STRATEGIC AND POLICY CONSIDERATIONS

### 2.1 Zoning & Reservations

#### 2.1.1 Metropolitan Region Scheme

Under the provisions of the Metropolitan Region Scheme (MRS) the subject land is zoned 'Urban' (refer **Figure 2**).

#### 2.1.2 City of Rockingham Town Planning Scheme No.2

Under the provisions of the City of Rockingham Town Planning Scheme No.2 (the Scheme) the subject land is zoned 'Development' (refer **Figure 3**) and forms part of Development Area 22 (DA22) and Development Contribution Area 2 (DCA2).

Schedule 8 of the Scheme lists environmental conditions applicable to the subject land, depicted as 'EC2' on the Scheme maps. The environmental conditions were imposed on the subject land via Scheme Amendment No. 300 to Town Planning Scheme No.1 (section 2.4.5 refers).

Schedule 9 of the Scheme requires an approved Structure Plan to guide subdivision and development for land located within 'Development Area 22'.

The subject land forms part of DCA No 2 and is therefore subject to development contribution requirements as outlined within Clause 5.6, Schedule 12 of the Scheme and DCA No. 2 Map. The provisions applying to the Development Contribution Area apply in addition to the provisions applying to any underlying zone or reserve and general provisions of the Scheme.

The liability for cost contributions applies in accordance with Clause 5.6.14 of the Scheme.

### 2.2 Baldivis (North) District Structure Plan

Endorsed by the Western Australian Planning Commission (WAPC) in 2000 and subsequently modified in 2006, the City of Rockingham's Baldivis (North) District Structure Plan (DSP) guides the preparation of Structure Plans by broadly defining preferred land uses and the district road network for the North Baldivis urban cell (refer **Figure 4**). It establishes a development framework for the location of major land uses, public transport, road layout, schools, open space and major infrastructure with respect to the physical and contextual opportunities for the site and community aspirations.

The DSP separates North Baldivis into three precincts, with the subject land being located within 'Precinct 2'. In accordance with the objectives of the DSP, this Structure Plan provides a greater level of detail in respect to the design for the site. The DSP shows the Structure Plan area as 'Residential' with a pocket of medium density in the north-west portion of the site and an area of public open space (POS) on the western side of the site. The main 'district' level design element influencing the Structure Plan design relates to the proposed east-west aligned Neighbourhood Connector road abutting the subject land's northern boundary, as well as the expansion of McDonald Road to the north which will intersect with the aforementioned Neighbourhood Connector road.

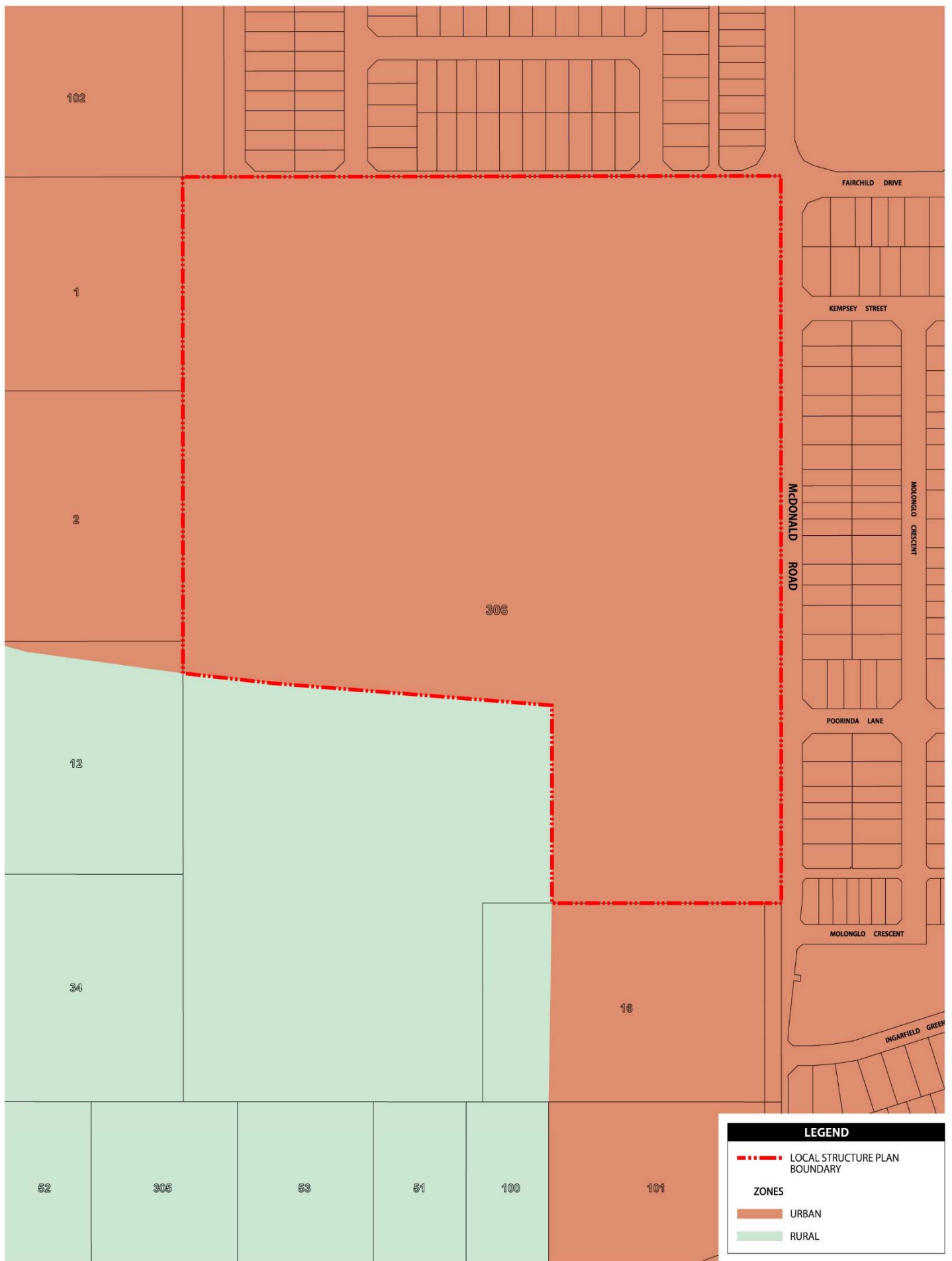
The Structure Plan is generally consistent with the intent of the endorsed DSP.

### 2.3 Key State Government Strategies and Policies

#### 2.3.1 Directions 2031 – Spatial Planning Framework for Perth and Peel (2009)

*Directions 2031*, the WAPC's strategic planning framework document for Metropolitan Perth and Peel, is a high level strategic plan that establishes a vision for the future growth of the Perth and Peel region. It provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate that growth.

Broadly defined, the Structure Plan area is located within the 'South-West Sub-Region', which encompasses the Local Governments of Cockburn, Rockingham and Kwinana. By 2031, the population of this sub-region is expected to grow by 70,000 people to a total population of 278,000. This will result in an additional 41,000 dwellings being required. This increase in population is expected to support an additional 41,000 jobs, and for which the document aims to have 70% of the total workforce employed locally.



## METROPOLITAN REGION SCHEME

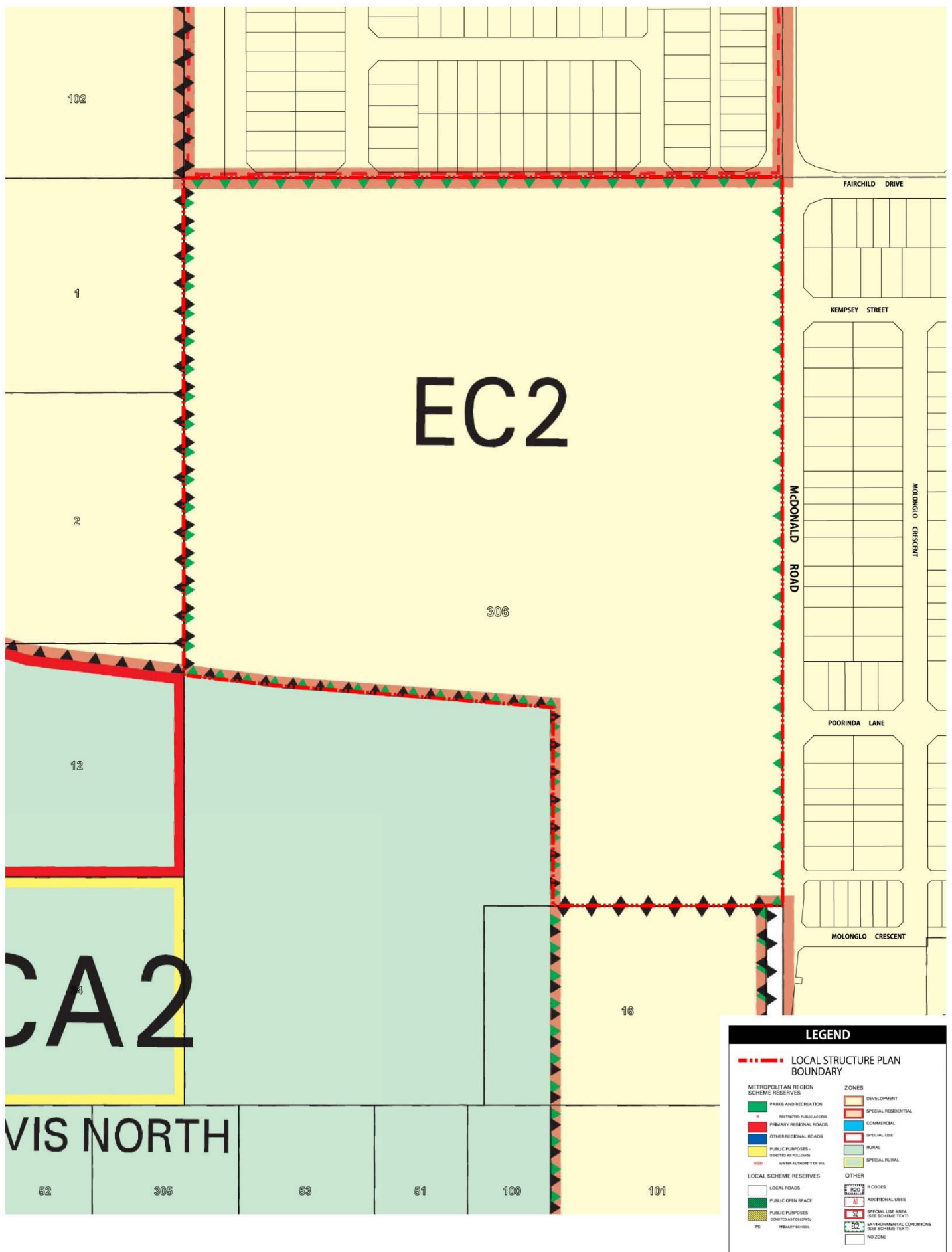
Figure 2



0 30 60 90m

Scale: 1:3000@A4 Date: 12/11/2015 Plan: SPGBD-5-008B





# **CITY OF ROCKINGHAM** **Town Planning Scheme No. 2 Zoning Map**

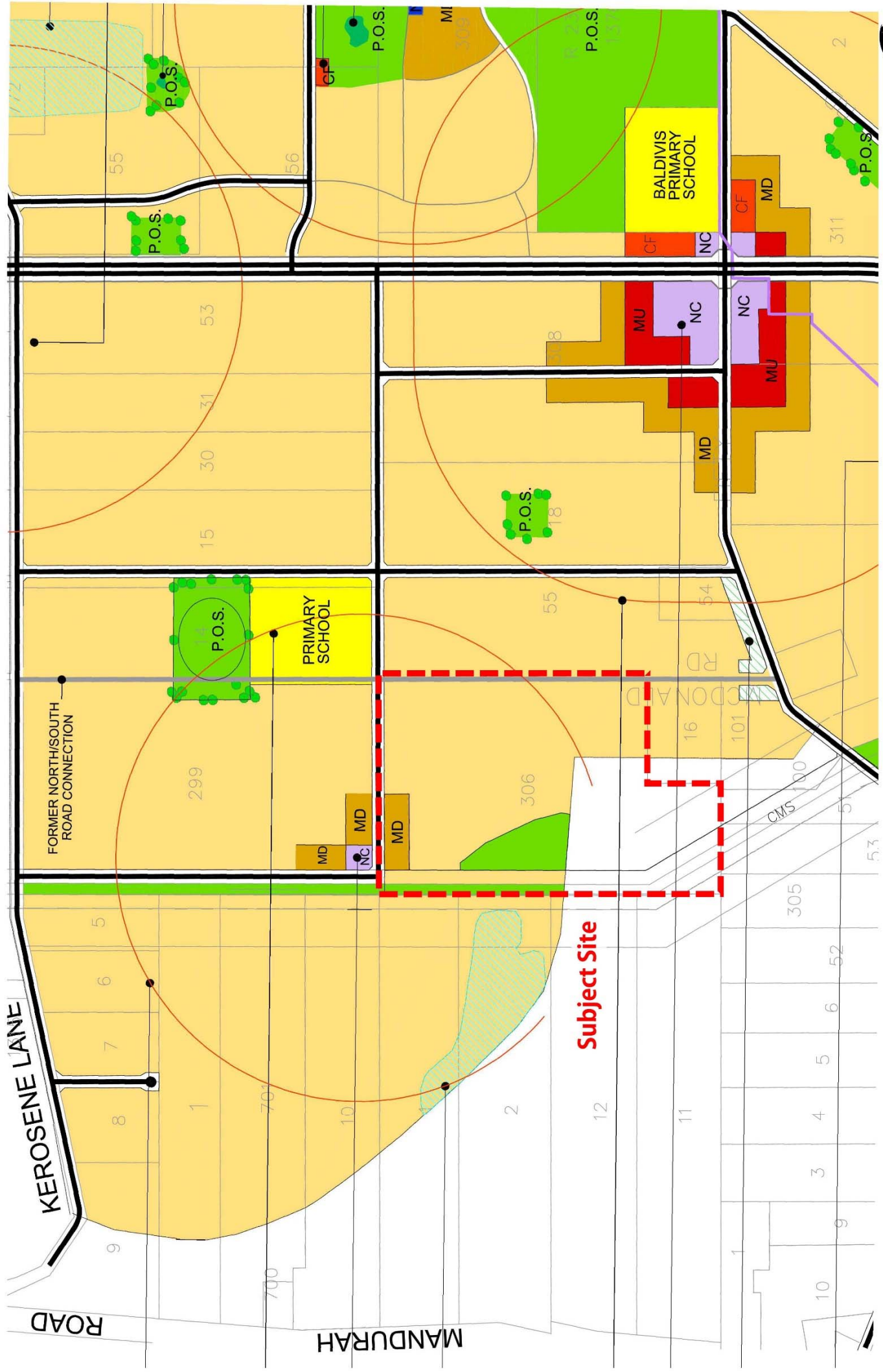
Figure 3



0 30 60 90m

Scale: 1:3000@A4 Date: 12/11/2015 Plan: SPGBD-5-008B





APPROVED MODIFICATION - BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN

Figure 4



### 2.3.2 Outer Metropolitan Perth and Peel, Sub-Regional Strategy

The *Outer Metropolitan Perth and Peel, Sub-Regional Strategy* (OMSRS) provides a framework for delivering the objectives of Directions 2031. The document provides a more detailed analysis in terms of strategic plans of action, stakeholder responsibilities and timeframes for delivery of development within the metropolitan corridors. The subject land identified as 'urban zoned – undeveloped' under the OMSRS and is referenced as 'BA1' in the South-West sub-region spatial framework map. The total site is projected to yield approximately 3,900+ dwellings by 2031, based on a 'Connected City' development model of 15 dwellings per gross urban zoned hectare.

### 2.3.3 Statement of Planning Policy 2.1 - Peel Harvey Coastal Plain Catchment

The objectives of this policy are to:

- Improve the social, economic, ecological, aesthetic, and recreational potential of the Peel - Harvey coastal plain catchment.
- Ensure that changes to land use within the catchment to the Peel – Harvey estuarine system are controlled so as to avoid and minimise environmental damage.
- Balance environmental protection with the economic viability of the primary sector.
- Increase high water using vegetation cover within the Peel - Harvey coastal plain catchment.
- Reflect the environmental objectives in the Environmental Protection (Peel Inlet -Harvey Estuary) Policy 1992.
- Prevent land uses likely to result in excessive nutrient export into the drainage system.

The Structure Plan incorporates Water Sensitive Urban Design principles and Best Management Practice to prevent excessive nutrient export into the drainage system and will improve social, aesthetic, environmental and recreational potential within the catchment while aiming to balance environmental protection with economic viability within the region.

### 2.3.4 Draft State Planning Policy 3.7 – Planning for Bushfire Risk Management and Draft Planning for Bushfire Risk Management Guidelines – 2014

The primary focus of these guidelines is to ensure that bush fire hazards are considered in planning decisions at all stages of the planning process; to avoid increased fire risk to life and property.

Given the 'Rural' zoned portion of Lot 306 (abutting the Structure Plan area) contains bushland, planning for bushfire protection requires consideration during the Structure Plan and subdivision phases of the development. Consideration of bushfire management at the structure planning level includes identifying potential bushfire hazards and providing adequate separation from these areas through design.

The Structure Plan road and cell design has been influenced by a detailed Fire Management Plan (FMP) (**Appendix 2** refers). The FMP provides guidance for detailed subdivision design to ensure all fire mitigation strategies, such as appropriate building setbacks, landscaping and interface treatment of the zone between the bushland and residential development is achieved.

The Policy informs the Structure Plan design, particularly along the western boundary of the subject land (Section 5.5 refers).

### 2.3.5 Planning Bulletin No.87 – High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region

This planning bulletin provides guidance on matters to be taken into account in considering planning proposals in the vicinity of the Dampier to Bunbury Natural Gas Pipeline and the Parmelia Gas Pipeline, in the Perth metropolitan region. Appendix 1 of the Bulletin - *Planning Guidelines for Proposals within the High Pressure Gas Transmission Pipeline Setback Distance* provide guidance regarding the setback distance, risk mitigation measures and pipeline risk assessment for proposed development in the setback area.

The bulletin applies to the Perth metropolitan region. It applies to schemes, scheme amendments, structure planning, subdivision or development, except for conventional agricultural or rural pursuits, within the vicinity of the Dampier to Bunbury Natural Gas Pipeline corridor and the Parmelia Gas Pipeline easement.

The Parmelia High Pressure Gas Pipeline runs in a north to south direction along the western boundary of the Structure Plan area. Land uses on the pipeline easement and within proximity to the easement are therefore guided by the Planning Bulletin No. 87 (refer **Appendix 3**).

## 2.3.6 Planning Bulletin No.112/2015 – Medium-density single house development standards – Structure plan areas

This planning bulletin provides an outline of acceptable residential development standards for medium-density single houses in structure plan areas for consistent application across WA.

The medium-density single house development standards act as a replacement to existing R-Codes standards for building and garage setbacks (Clauses 5.1.2, 5.1.3 and 5.2.1), open space (Clause 5.1.4), parking (Clause 5.3.3), visual privacy (Clause 5.4.1) and solar access (Clause 5.4.2).

All other R-Codes standards apply, where relevant to the proposal, including site area (Clause 5.1.1); building height (Clause 5.1.6); street surveillance, walls, fences and sightlines (Clauses 5.2.3 to 5.2.5); parking space design and vehicular access (Clauses 5.3.4 and 5.3.5); site works, retaining walls and stormwater management (Clauses 5.3.7 to 5.3.9); and outbuildings, external fixtures and utilities and facilities (Clauses 5.4.3 to 5.4.5).

The remaining R-Codes standards in Part 5 do not apply as they do not relate to single house development, including communal open space (Clause 5.1.5); appearance of retained dwelling (Clause 5.2.6); landscaping (Clause 5.3.2); and pedestrian access (Clause 5.3.6).

The medium-density single house development standards as outlined by Planning Bulletin 112/2015 are attached to Part One of this report under **Table 1**.

## 2.4 Key Local Government Strategies and Policies

### 2.4.1 City of Rockingham Urban Growth Programme (2009)

The City of Rockingham *Urban Growth Programme* has been prepared by the City to assist in understanding the likely pattern of urban growth to 2031. The Urban Growth Programme recognises the subject land as being developed for urban purposes, with commencement of development forecast between 2012 and 2021.

### 2.4.2 City of Rockingham Developer Contribution Plan No. 2

The subject land falls within Developer Contribution Area (DCA) 2. Development Contribution Plan No.2 will assist in the funding of community infrastructure by requiring landowners to pay a contribution when their land is subdivided or developed. The introduction of developer contributions is provided for by *State Planning Policy No.3.6 - Developer Contributions for Infrastructure*.

The requirement for developer contributions is prescribed under Schedule 12 of the City's Town Planning Scheme No.2. Under Developer Contribution Plan No. 2 the Structure Plan is located within the 'Baldivis North Sub-Area'. Developer contributions are to be addressed at the subdivision stage or before the construction of dwellings commences.

### 2.4.3 City of Rockingham Local Planning Policy 3.4.1 – Public Open Space

Local Planning Policy 3.4.1 – Public Open Space (LPP 3.4.1) has been prepared to address the design, location and maintenance of public open space (POS) to an acceptable standard.

In accordance with recently approved Structure Plans within the City of Rockingham the crediting of restricted and unrestricted open space within the Parmelia Gas Pipeline Easement for Lot 306 has been calculated using the method as follows:

- Pipeline easement/core identified as restricted open space.
- Pipeline buffer identified as unrestricted open space (100% credit).
- Restricted open space to account for a maximum of 2% as per *Liveable Neighbourhoods*.
- Excess restricted POS applied as a deduction.

Section 5.7 addresses how the policy has been applied through the Structure Plan.

### 2.4.4 Relevant Council Policies

The following Local Government Policies are considered relevant and applicable to the Structure Plan area:

- Policy 3.3.7                      Display Home Centres
- Policy 3.3.20                    Residential Design Codes
- Policy 3.4.2                      Subdivision Fencing

- 
- Policy 7.2 Local Bushland Strategy
  - Procedure 1.9 Detailed Area Plans

### 2.4.5 Other Approvals and Decisions

The Structure Plan area comprised part of Amendment No. 300 to the City of Rockingham's Town Planning Scheme No. 1, which was initiated to rezone a number of landholdings including a portion of Lot 306 from 'Rural' to 'Development'. The rezoning application was assessed by the EPA in 2001 and it was determined that the proposal could be implemented subject to conditions. The formal approval and associated conditions are outlined in Ministerial Statement No. 580 (dated 19th December 2001) (refer **Appendix 4**) and included in Schedule 8 of the Scheme. The conditions require preparation of the following management plans:

- Condition 1: Drainage and Nutrient Management Plan (addressed as a Local Water Management Strategy (LWMS) in accordance with the Department of Water's (DoW) Better Urban Water Management Guidelines (DoW, 2008));
- Condition 2: Soil and Groundwater Investigation and Remediation Plan (addressed as a Preliminary Site Investigation – detailed in Section 3.1.4 of this report);
- Condition 3: Pipeline Protection Plan (addressed at subdivision stage through the preparation of PPP – detailed in Section 3.5 of this report);
- Condition 4: Spray Drift Investigation and Management Plan; and
- Condition 5: Vegetation Management Plan.

Not all of the conditions are specifically relevant to the Structure Plan area, but those that are must be addressed prior to development of the subject land, in accordance with the provisions under the City of Rockingham's TPS No.2, Schedule 8. A brief outline of the conditions relevant to the Structure Plan area has been provided below:

- Condition 1 relating to a Drainage and Nutrient Management Plan will be address through the Local Water Management Strategy.
- Condition 2 relating to a Soil and Groundwater Investigation and Remediation Plan will be addressed through a Preliminary Site Investigation which is discussed within the Environmental Assessment Report (refer **Appendix 5**).
- A Pipeline Protection Plan (PPP) identified under Condition 3 will be addressed at subdivision stage via an imposed condition of subdivision approval.
- Condition 4 relating to the Spray Drift Investigation and Management Plan is not relevant to this site as market gardening activities have recently ceased.
- Condition 5 relating to the Vegetation Management Plan (VMP) is not relevant to this site as it does not abut Bush Forever Site 356.

## 3 SITE CONSTRAINTS

### 3.1 Existing Environment

An Environment Assessment Report (EAR) has been prepared by Coterra Environment in support of this Structure Plan. A summary of the key findings of the EAR is provided below. The detailed findings of the EAR are contained under **Appendix 5**.

#### 3.1.1 Topography

The subject land has a significant rise to the central west boundary, with the remainder of the area being relatively flat (refer **Figure 5**). The land height is roughly 5 metres Australian Height Datum (AHD) at the eastern and southern boundaries, and approximately 15 metres AHD at the northern boundary. The elevation rises steeply to 40 metres AHD in the western portion.

#### 3.1.2 Landforms and soils

The Department of Minerals and Energy (2000) mapping indicates that the subject land contains two natural soil types of the Spearwood and Tamala soil systems consisting of:

- Sand (S7): pale yellowish brown, medium to coarse-grained, sub-angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin; and,
- Limestone (LS1): pale yellowish brown, fine to coarse-grained, sub-angular to well rounded, quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin.

#### 3.1.3 Acid Sulfate Soils

According to Acid Sulfate Soil (ASS) risk mapping sourced from the CSIRO *Australian Soil Resource Information System* (ASRIS) database, the subject land is identified as having 'no known occurrence of actual acid sulfate soils (AASS) and potential acid sulfate soils (PASS) occurring'.

A small portion of land outside the Structure Plan area (but within Lot 306) in the south-western corner of the rural area may be within an area where there is a 'high probability of AASS and PASS occurring'.

An ASS investigation is planned to be undertaken for the subject land early in 2015. Depending upon the results of the ASS investigation and proposed earthworks, an Acid Sulfate Soil Assessment and Dewatering Management Plan will be prepared if required. This plan will be approved for implementation by the DER prior to any ground disturbing works being undertaken.

#### 3.1.4 Contamination

The DER's online Contaminated Sites Database was searched for known or suspected contaminated sites in November 2014. No known or suspected contaminated sites were identified within the subject land.

Given the previous land uses on the subject land (horticulture), it is expected that development of the area will attract a WAPC condition with regard to potential contamination on-site. To pre-empt this condition, Emission Assessments Pty Ltd undertook a Preliminary Site Investigation (PSI) and a Sampling and Analysis Quality Plan (SAQP).

The PSI and SAQP has been completed and approved by an auditor (EAPL, 2014a) with a summary of the key findings are provided within the EAR, (refer section 4.3 of the EAR, contained within **Appendix 5**).

The investigation determined that a DSI will be required to assess the nature, extent and magnitude of contamination (if present) at the locations identified as having potential contamination concerns. The need for remedial works will be identified following these site specific investigations.

The DSI (Detailed Site Investigation) prepared for the site addresses the requirements of the Ministerial Statement. It should be noted that based on the available data presented within the DSI, the site is considered to be suitable for its proposed land use for residential development and POS. Soil remedial works are not considered required as no risks to human health have been identified and there were only two isolated Ecological Screening Level occurrences, which are considered not to pose a significant risk to human health and/or the environment.



**LEGEND**

- LOCAL STRUCTURE PLAN BOUNDARY
- GAS PIPELINE CENTRELINE
- GAS PIPELINE CORRIDOR

# SITE ORTHOPHOTO

Figure 5



0 30 60 90m

Scale: 1:3000@A4 Date: 12/11/2015 Plan: SPGBD-5-004A



### 3.1.5 Hydrology

#### 3.1.5.1 Groundwater

The Perth Groundwater Atlas indicates that the site is underlain by three primary aquifers – Perth Superficial Swan Aquifer, Perth Confined Leederville Aquifer and Perth Confined Yarragadee Aquifer. The minimum groundwater level contours are at approximately 1.5 to 1.75 m AHD across the subject land.

Regional groundwater information indicates that groundwater flow is generally in a westerly direction.

#### 3.1.5.2 Surface Water & Wetlands

A search of the Department of Parks and Wildlife (DPAW) geomorphic wetlands database indicated there are no wetlands within the Structure Plan area.

A Conservation Category (CCW) dampland is located to the south-west of the Structure Plan area (in the south western corner of Lot 306). As a CCW, this wetland requires a minimum 50 metre buffer to development which does not impact on the Structure Plan area.

There are no wetlands within the subject land listed under the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*.

There are no other natural watercourses or waterbodies within or near the subject land.

#### 3.1.5.3 Peel-Harvey Estuary Catchment

The subject land is located within the Swan Coastal Plain Catchment of the Peel-Harvey Estuary, which has a history of poor water quality. The objective of the *Environmental Protection (Peel Inlet – Harvey Estuary) Policy 1992* is to reduce the input of phosphorous into the Peel-Harvey Estuary through a number of means, which includes appropriate land management by landowners in the policy area.

A change in land use from predominantly agricultural to urban development, with a reticulated sewer system, will reduce the potential for nutrient export to the receiving environment, which is in accordance with the general objectives of the policy.

### 3.2 Vegetation & Flora

The subject land contains a small area (approximately 2.5 to 3 ha) of vegetation in the central-west portion. The balance of the subject land has previously been cleared to accommodate market gardens and contains no native vegetation. The eastern portion of the vegetated area was previously cleared in the early 1980's and has regrown since this time.

A Level 2 flora and vegetation survey was undertaken by Bennett Consulting Ecologists Pty Ltd (BCE), with the field component of the works carried out on 2 April 2014 and 6 November 2014 (spring survey). Temporary quadrats were recorded and flagged during the first field survey in order to conduct the comparative survey in spring.

No threatened or priority flora or threatened or priority ecological communities were identified during the flora and vegetation survey.

### 3.3 Fauna & Habitat

A site visit was undertaken by Coterra Environment in May 2014, which was also used as an opportunity to assess the significance of the subject land with regard to fauna habitat. The majority of the subject land is devoid of vegetation and has no habitat value. There is a small patch of impacted vegetation in the central western portion of the subject land.

The species listed in **Table 2** are considered to be the only conservation significant fauna species that may potentially utilise the subject land, based on the features and available habitats.

**Table 2: Conservation Significant Fauna Desktop Search Results**

Species	WA Conservation Status	EPBC Act Conservation Status
<i>Calyptorhynchus baudinii</i> (Baudin's Black Cockatoo)	Threatened	Vulnerable
<i>Calyptorhynchus latirostris</i> (Carnaby's Black Cockatoo)	Threatened	Endangered
<i>Calyptorhynchus banksii subsp.naso</i> (Forest Red-tailed Black-Cockatoo)	Threatened	Vulnerable
<i>Isododon obesulus fusciventer</i> (Quenda)	Priority 5	-

The site inspection identified that a few of the larger tuarts contained small hollows, which in some cases were inhabited by feral bees. Generally mature tuart and marri trees are known to potentially provide roosting, feeding and/or breeding opportunities of the three black cockatoo species. The clearing of some of these remaining trees within the subject land will not be detrimental to the local populations of cockatoos, as the protected bushland areas nearby provides habitat of significantly greater ecological value. Further to this the Structure Plan design proposed to retain some tuart trees within POS B based on their potential value as habitat for fauna including but not limited to protected black cockatoo species.

### 3.4 Cultural Heritage

A search of the Department of Aboriginal Affairs (DAA) Heritage Sites database determined that no sites of Aboriginal significance have been recorded within the Structure Plan area.

The nearest site is located some 1.2 km south of the subject land near the proposed Nairn Road realignment (Site Reference: 4323; Artefact/Scatter). No other registered sites are located within or nearby the subject land.

All contractors working on the development will be made aware of their responsibilities under the *Aboriginal Heritage Act 1972* with regard to finding potential archaeological sites. In the event a site is discovered, all work in the area will cease and the DAA will be contacted.

### 3.5 Parmelia Gas Pipeline

The Parmelia High Pressure natural gas pipeline runs through the site in a north-south direction along the western portion of the Structure Plan area.

Two statutory requirements exist to address matters relating to the Parmelia Gas Pipeline, these include the following:

- Pursuant to *EPA's Ministerial Statement 580*, Schedule 8 of the Scheme; and
- WAPC's Planning Bulletin 87 '*High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region*'.

The *EPA's Ministerial Statement 580*, Schedule 8 of the Scheme stipulates minimum setbacks for land uses and developments and requires the preparation of a Pipeline Protection Plan. The Structure Plan has been designed to incorporate the required setbacks, and allowed land uses identified as permissible within proximity to the pipeline alignment.

WAPC Planning Bulletin 87 requires preparation of a Pipeline Risk Management Plan.

It is acknowledged that the requirements pursuant to the *EPA's Ministerial Statement 580*, Schedule 8 of the Scheme and WAPC's Planning Bulletin 87 will be addressed through conditions imposed on subdivision approval.

Further to this, in December of 2014 a meeting was held with APA Group to discuss the proposed Structure Plan. The APA Group confirmed the following:

- a 32 metre setback to residential development is adequate;
- the land use mix proposed in the Structure Plan is acceptable;
- It is considered acceptable that the gas pipeline easement will be located within POS with the minimal intentions for the POS and the intention for the grade of the land over the pipeline to remain as they currently are;

- 
- the APA Group accepts the need for a road crossing over the pipeline easement to access the Urban areas to the west of the Structure Plan area and in addition, the need for a second connection (unsealed) to the west for fire management; and
  - a risk assessment and the preparation of protection and management plans for the pipeline are to be undertaken at the subdivision stage of the development project once the land use mix and urban form has been approved (via Structure Plan approval) and importantly once detailed civil engineering design has been completed.

Correspondence from APA Group confirming the above is enclosed as **Appendix 6**.

## 4 CONTEXT ANALYSIS

A 'Regional Context Plan' is included under **Figure 6**. A 'Local Context and Constraints Plan' is included under **Figure 7**. The Structure Plan area is located approximately 2.4km west of the Kwinana Freeway, and approximately 4km east of the Perth to Mandurah rail-line.

### 4.1 Surrounding Land Use

The subject land is physically bound on all four sides by:

- Market gardens to the north;
- Rural zoned land to the south;
- 'The Chimes' Estate – currently under construction to the east; and
- Vacant land to the west.
- The Parmelia High Pressure Natural Gas Pipeline traverses the Structure Plan area in a north-south direction along the western boundary.

### 4.2 Existing Movement Network

The Structure Plan area is bound by McDonald Road to the east and the unconstructed Elderberry Drive to the north. The Kwinana Freeway is located approximately 2km to the east, which provides direct access to the Perth Central Business District, Mandurah Town Centre and beyond. Mundijong Road, located approximately 1.1km to the north, connects the Kwinana Freeway to the Structure Plan area. Mandurah Road is located 1.1km west of the subject land and Baldivis Road is located 1.3km east of the site, providing exceptional north-south access to the broader Perth and Peel Regions.

Access to the Structure Plan area is currently gained from private access roads connecting to McDonald Road. Transperth does not currently operate any bus routes within close proximity to the Structure Plan area. The closest bus connection is Bus Route 568, which terminates in Australand's Baldivis Central Estate to the south-east. The route navigates through residential estates south of Safety Bay Road en route to Warnbro Station.

The Perth to Mandurah railway line is located approximately 4.5km from the Structure Plan area, with stations located at Warnbro, Rockingham and Wellard.

### 4.3 Activity Centres and Employment Nodes

The Structure Plan area is located approximately 6.5km south-east of Rockingham Strategic Metropolitan Centre. Several important activity centres and employment generators also exist in close proximity. These include:

- Baldivis District Town Centre, located ~ 3km south of the subject land;
- Port Kennedy Business Park ~ 7.5km to the south-west subject land;
- Rockingham Industrial Zone ~ 6km north-west of the subject land;
- Kwinana Secondary Centre, located ~ 6.5km north of the subject land; and
- Kwinana Industrial Area, located ~8.5km north-west of the subject land.

Furthermore, the Structure Plan area benefits from proximity to a strong regional and district road network that includes Kwinana Freeway, Fifty Road, Baldivis Road and Mandurah Road. This established road network provides direct connections to regional employment centres of Mandurah, Kwinana, Rockingham, Fremantle, and Perth Central Business District.

Opportunities for local employment will be further enhanced by the development of future nearby industrial areas, including Latitude 32, Nambeelup and North-East Baldivis. These areas are earmarked by Directions 2031 and the *'Economic and Employment Lands Strategy: non-heavy industrial: Perth metropolitan and Peel regions'* for future expansion of employment land uses.

### 4.4 Education

Existing public primary schools in close proximity to the Structure Plan area include:

- Baldivis North, located approximately 750m east;

- Makybe Rise, 4.6km south; and
- Settlers Hill, 4.8km south-west of the Structure Plan area. And
- Directly north-east of the Structure Plan area there is a new Primary School opening in 2017.

Public secondary education facilities will be accommodated by Baldivis High School, Warnbro Community High School and Safety Bay High School, located 3.5km south-east, 7.5km east and 7.3km south-west of the Structure Plan area, respectively. A Secondary School is planned in the vicinity of Zig Zag Road, approximately 1.5km east of the Structure Plan area. This School is proposed within a 5 – 10 year timeframe and will ultimately service the Structure Plan area.

Several private schools exist within the locality, including:

- Tranby College, located 4.5km south;
- Mother Teresa Catholic College, located 6km south;
- South Coast Baptist College, 5.6km south-west;
- Kolbe Catholic College, 6.0km north west; and
- Living Waters Lutheran College, 6.6km south-west of the subject land.

The Rockingham and Mandurah campuses of Murdoch University and Challenger TAFE offer opportunities for tertiary education within close proximity to the Structure Plan area. The Structure Plan area's proximity to the regional road network and Mandurah rail line creates access for future residents to a variety of universities across the metropolitan region.

#### **4.5 District and Regional Open Space**

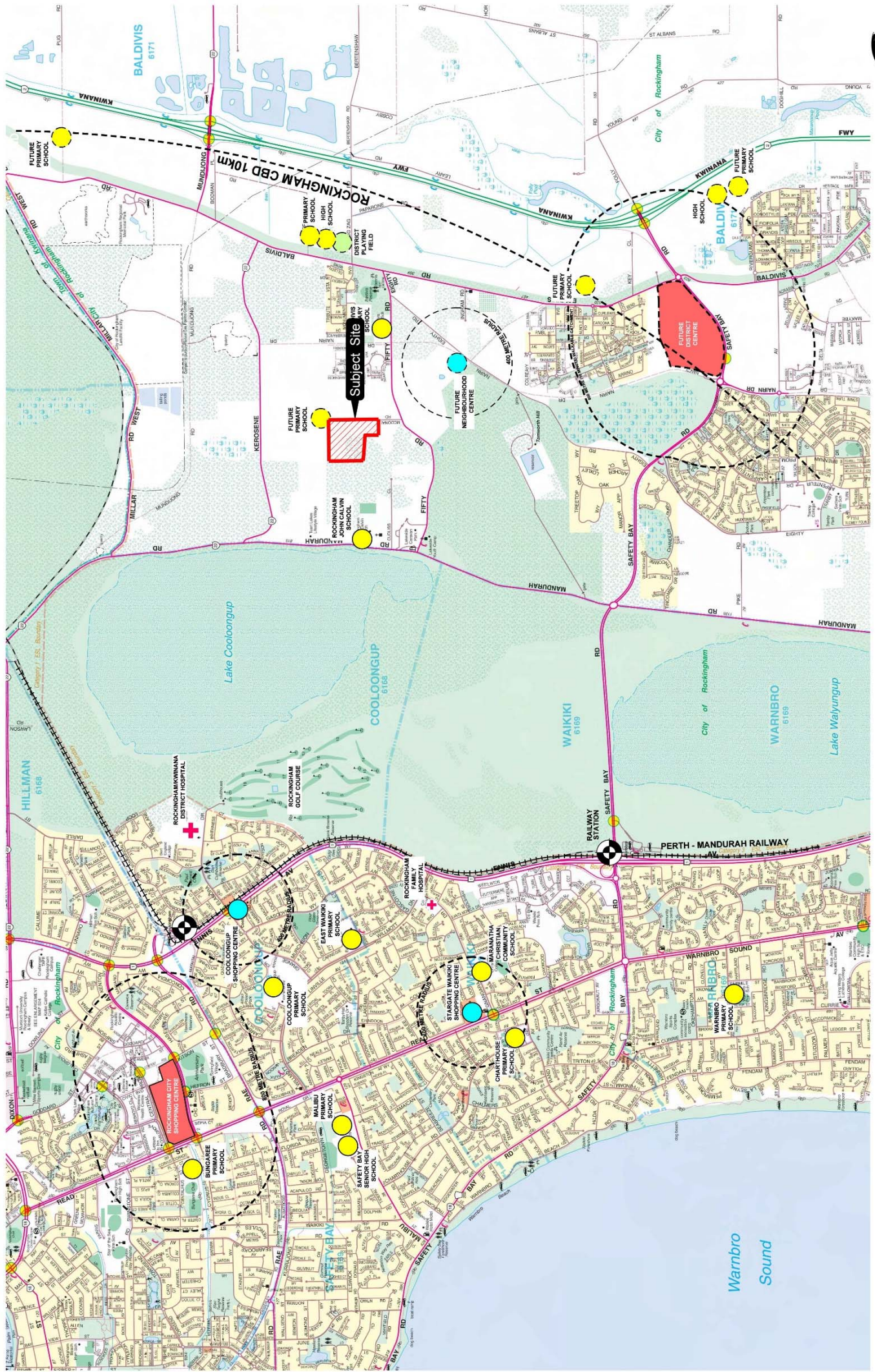
Two expansive areas of open space, Rockingham Lakes Regional Reserve and Lake Coolongup, are within two km of the Structure Plan area. The Baldivis DSP also identifies future district level playing fields to be located approximately 1km east of the subject land.

Additionally, the regional road network provides direct connection to the Golden Bay foreshore, Rockingham Lakes Regional Park, Paganoni Swamp and the Peel Inlet.

#### **4.6 Employment Opportunities**

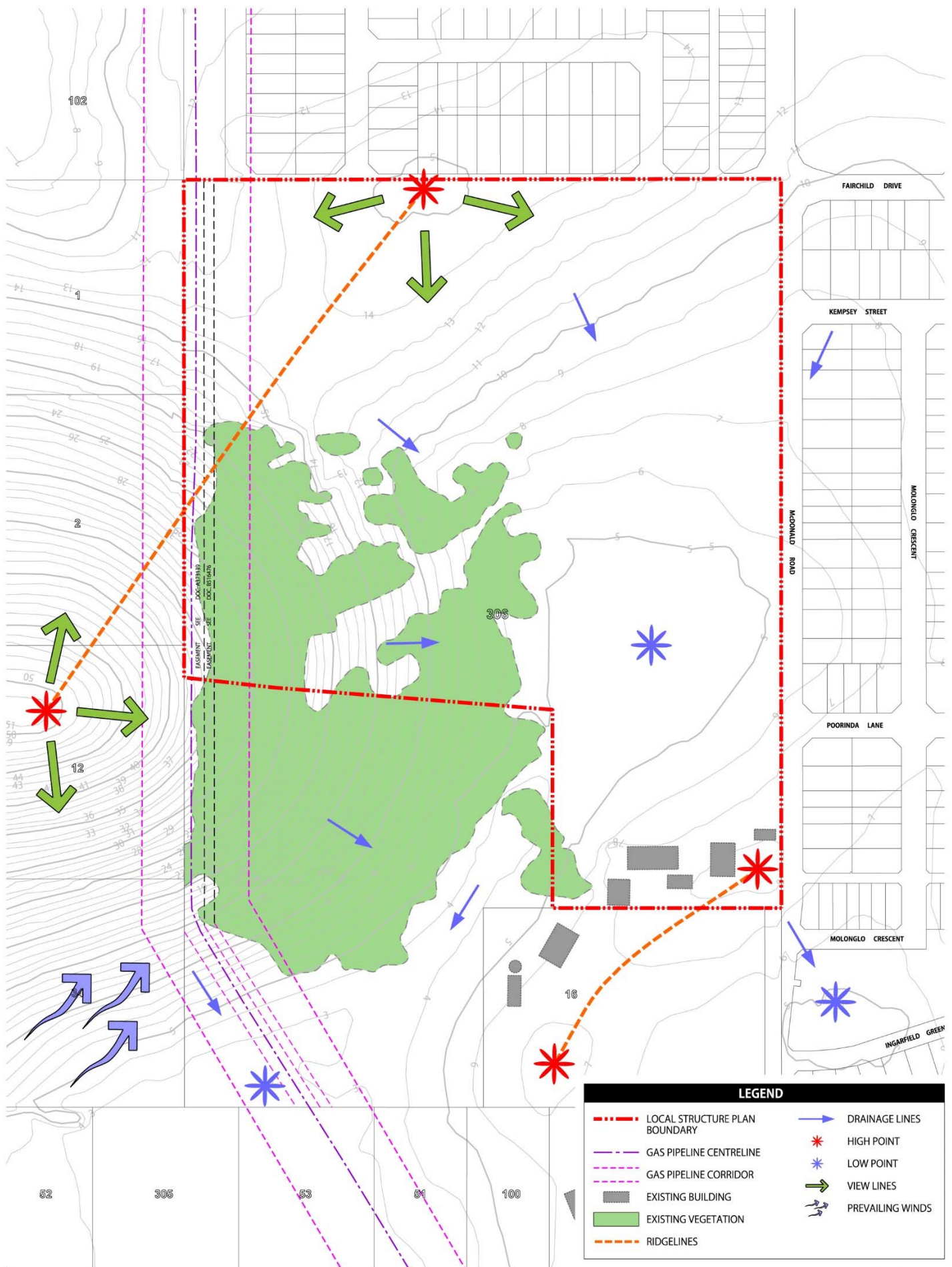
At a district level, employment land uses in close proximity to the Structure Plan area include:

- The expanding Baldivis District Town Centre, located approximately 3km to the south;
- The Rockingham Trade Centre, offering bulky goods, retailing, light industrial land uses and employment opportunities, located approximately 5.5km north west of the Structure Plan area; and
- The Rockingham/Kwinana District Hospital located 3.5km north-west of the Structure Plan area.



REGIONAL CONTEXT PLAN

Figure 6



## LOCAL CONTEXT & CONSTRAINTS PLAN

Figure 7



0 30 60 90m

Scale: 1:3000@A4 Date: 12/11/2015 Plan: SPGBD-5-001B



## 5 STRUCTURE PLAN

### 5.1 Design Philosophy

The Structure Plan proposes a design layout which fosters an efficient and permeable road network and corresponding residential development cells. The design philosophy has been predicated upon the following objectives:

- Provision of road linkages with landholdings adjacent to the Structure Plan area, particularly in relation to the Paradiso Estate to the north and the Chimes Estate to the east, to foster connectivity and integration with existing and future development of the surrounding land;
- Suitable interface with adjacent urban and rural areas;
- Provision of an appropriate density coding to residential development in proximity to Parmelia Gas Pipeline;
- Incorporating the Parmelia Gas Pipeline into facets of design, limiting the risk to dwellings without diminishing visual aesthetics;
- Appropriate connection to District and Regional road networks;
- Location and provision of public open spaces to ensure accessibility, diversity in types and usability, tree retention where practical, visual aesthetics, view corridors and the integration of stormwater management within open spaces;
- Implementation of innovative design and drainage solutions based on the challenging contours and natural character of the land; and
- Delivery of safe and connected pedestrian and cyclist environments linking residential cells and associated local parks, as well as providing for external connectivity outside of the Structure Plan area.

### 5.2 Land Composition

The subject land will be developed generally for residential purposes, comprising the following:

**Table 3: Land Use Budget**

<i>Land Use Budget</i>	<i>(ha)</i>
<b>Site Area</b>	
• Residential Land ~ 8.18 ha	13.115
• Public Open Space ~ 1.74 ha	
• Roads ~ 3.19ha	
<b>Deductions</b>	
Overprovision of Restricted POS:	0.27
<b>Gross Subdivisible Area</b>	12.85
<b>POS Requirement 10%</b>	1.28
Maximum Restricted Open Space (20%):	0.26
Minimum Unrestricted Open Space (80%):	1.03

## 5.3 Residential Densities and Dwelling Forecasts

### 5.3.1 Dwelling Forecasts – *Directions 2031*

The Structure Plan area falls within area 'BA1' of the *Outer Metropolitan Perth and Peel Sub-regional Strategy* (OMSRS); the total 'BA1' area is forecast to yield approximately 3,900+ dwellings. Within the Structure Plan area, based on a 'Connected City' development model of 15 dwellings per gross urban zoned hectare, the estimated dwelling yield would be approximately 195 dwellings; or 131 dwellings based on a 'business as usual' scenario of 10 dwellings per gross urban zoned hectare.

**Table 4: Dwelling Forecasts**

Directions 2031 Scenarios	Projected Dwellings:
'Connected City' @ 15 dwellings per gross urban zone	~195 dwellings (13.12 x 15)
'Business as usual' @ 10 dwellings per gross urban zone	~131 dwellings (13.12 x 10)

The relevant *Directions 2031* dwelling yield forecast is based on a 'Gross Urban Zone Density'; this interpreted to include all 'urban' zoned land (i.e. residential cells, Public Open Space, roads, Primary School, Neighbourhood Centres).

A dwelling yield projection prepared by the project team, and based on *generic* lot sizes, suggests a minimum yield in the order of 195+ dwellings across the Structure Plan area, hence conforming to the estimated *Directions 2031* dwelling targets.

The proposed forecast across the Structure Plan area is subject to the final design for respective subdivision stages; this based on detailed drainage and environmental constraints, including limitations imposed by the Parmelia Gas Pipeline on increased density. Preferred lot mix and market demand at the time of land release will also influence dwelling yields. Nevertheless, the Structure Plan area will potentially accommodate a population in the order of 540+ people, at a rate of 2.8 persons per household.

### 5.3.2 Dwelling Forecasts – Liveable Neighbourhoods

The majority of the Structure Plan area has been assigned a RMD R25 Residential Density Coding; with medium density (RMD R40) development proposed in proximity to POS areas.

The RMD R25 and RMD R40 density codings offer a minimum and average lot product considered suitable for this location within the outer-metropolitan area of Perth; being a combination of lot product ~300m<sup>2</sup> – 600m<sup>2</sup> in area. Estimate dwellings yields are in the order of:

- Residential RMD R25: 170+ dwellings
- Residential RMD R40: 25+ dwellings

Based on the *Liveable Neighbourhoods* 'Site Hectare' definition, the overall density for the Structure Plan area equates to approximately 24 dwellings per site hectare, therefore fulfilling *Liveable Neighbourhoods* density objectives.

### 5.3.3 Density

The Codes allocated over the Structure Plan area include:

#### 5.3.3.1 Residential RMD-25 (Base)

Residential RMD-25 will be the minimum base coding over the Structure Plan area; thus allowing for the provision of single residential lots ranging with a minimum 300m<sup>2</sup> and averaging 350m<sup>2</sup>. This density coding has been applied to the Structure Plan area in response to the constraints placed on development by proximity to the Parmelia Gas Pipeline.

#### 5.3.3.2 Residential RMD-40

The proposed RMD-40 pockets are generally located in close proximity to:

- areas of high amenity, such as POS, primary connector roads and/or Neighbourhood Activity Centre; and
- locations that enhance passive surveillance of public spaces.

This is consistent with *Liveable Neighbourhoods Elements 3* requirements which states that smaller lots and lots capable of supporting higher density should be located close to high amenity areas.

### 5.3.3.3 Housing Typologies and Lots Orientation

The housing typologies envisaged will include Single-Storey, Double-Storey, Traditional Loaded and Rear Loaded Cottages. The character of these typologies will differ depending on the nature of the lot and surrounding environment.

Where the orientation of the lot makes it possible, dwellings will be orientated north for good solar passive design. However, where contours and landform have taken priority in determining lot orientation, and northern orientation cannot be achieved, dwellings will be individually designed incorporating sun control elements such as solar shading devices for harsh summer sun, or the appropriate location of living spaces to maximise access to winter sun.

### 5.3.4 Variations to R-Codes

The Residential Medium Density Codes outlines variations to the Residential Design Codes that are deemed to constitute 'deemed-to-comply' Development within the Structure Plan area and which do not therefore, require neighbour consultation and planning approval (as per *Planning Bulletin 112/2015* – May 2015).

The provisions set out in Residential Medium Density Codes act as a replacement to existing R-Codes standards for building and garage setbacks (Clauses 5.1.2, 5.1.3 and 5.2.1), open space (Clause 5.1.4), parking (Clause 5.3.3), visual privacy (Clause 5.4.1) and solar access (Clause 5.4.2).

All other R-Codes standards apply, where relevant to the proposal, including site area (Clause 5.1.1); building height (Clause 5.1.6); street surveillance, walls, fences and sightlines (Clauses 5.2.3 to 5.2.5); parking space design and vehicular access (Clauses 5.3.4 and 5.3.5); site works, retaining walls and stormwater management (Clauses 5.3.7 to 5.3.9); and outbuildings, external fixtures and utilities and facilities (Clauses 5.4.3 to 5.4.5).

Local Development Plans (LDPs) will be required for lots requiring development standards in accordance with AS3959-2009 as identified in Figure 9 of the FMP (refer **Appendix 2**).

### 5.3.5 Parking

On-street visitor parking bays are provided in close proximity to POS area. The provision on on-street visitor parking will alleviate concerns of cars parking over footpaths, thus minimising pedestrian-vehicle conflict, particularly surrounding areas of POS.

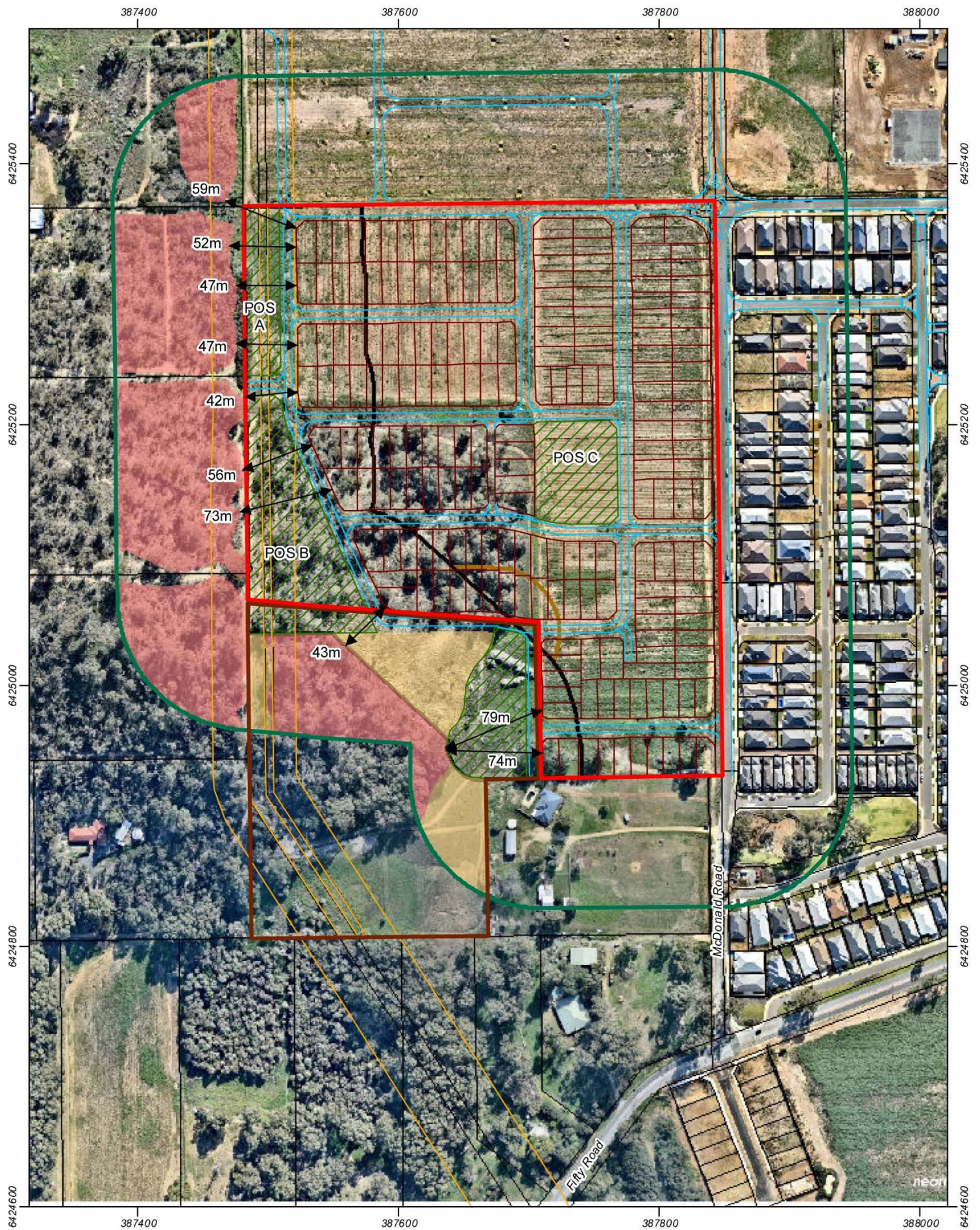
## 5.4 Planning for Bushfire Management

Strategen has prepared a Fire Management Plan (FMP) to accompany the Structure Plan (refer to **Appendix 2** and **Figures 8** and **9**). The FMP has been prepared in line with the bush fire planning framework that was active at the time of initial lodgement of the Structure Plan, which included Planning for Bush Fire Protection Guidelines (Edition 2) and Draft State Planning Policy 3.7 Planning for Bushfire Risk Management.

The FMP documents the assessment of forest, woodland and grassland vegetation classes, effective slope and bushfire hazard levels within 100 m of the Structure Plan boundary. Assessment of these parameters was used to determine the Bushfire Attack Level (BAL) and extent of proposed development subject to application of AS 3959 and increased building construction standards, as well as the critical site interfaces requiring provision of low fuel defensible space in the form of Asset Protection Zones (APZs, formerly BPZs).

Bush fire management measures were developed for the proposed development in response to the existing fire environment and risk, including:

- application of BAL 12.5 building construction standards where required under AS 3959 (refer to Figure 9 of the FMP)
- provision of a 20m wide APZ at the interface with classified vegetation in the form of road reserves and low fuel managed POS
- reduction of the APZ width to 17m adjacent to grassland vegetation at the interface with a small selection of lots incorporating a 15m wide road reserve and 2m building setback
- ongoing commitments to manage POS in a low fuel state
- provision of a minimum of two different vehicular access routes for all future residents, visitors and emergency services at all times, including road access at all hazard interfaces
- a reticulated water supply and network of hydrants.



**Figure 8 Bush fire hazard assessment map**

Scale 1:4,000 at A4

0 20 40 60 80 100 m

Coordinate System: GDA 1994 MGA Zone 50  
Note that positional errors may occur in some areas  
Date: 23/08/2016

Author: JCrute  
Source: Aerial image: Neamap, flown 06/2016. Concept plan:  
Client 07/2016. Existing cadastre: SLIP, Landgate 2016.

Path: Q:\C:\Users\JCrute\Documents\B2061\Dev1\B2061\1045\_01\_B2061\_Dev1\_F008.mxd

#### Legend

- Project area boundary
- Balance rural lot
- 100m wide assessment area
- Existing cadastre
- Carriageways
- Easement gas pipeline
- POS
- Proposed lots
- 100m wide BAL assessment area

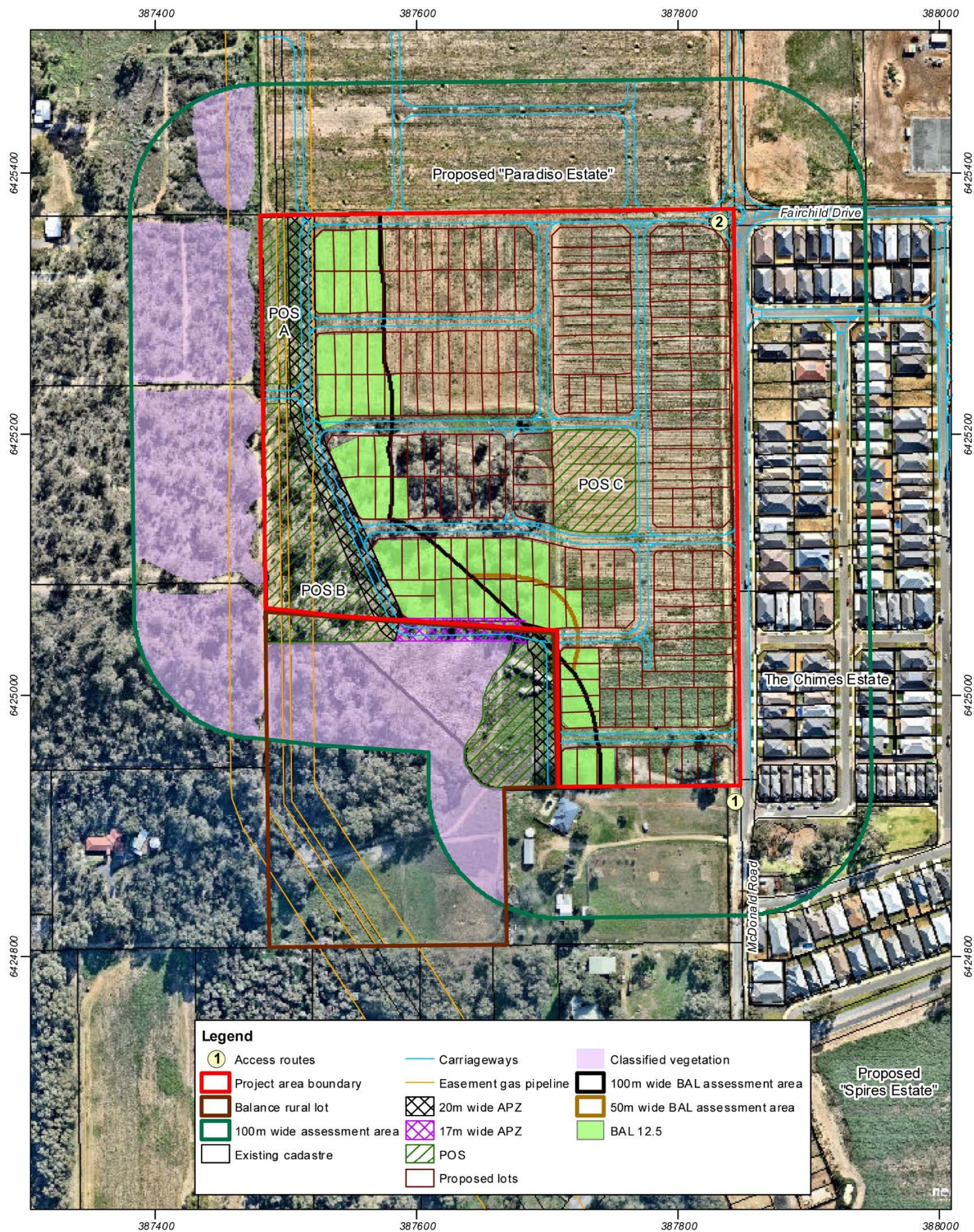
  50m wide BAL assessment area

#### Bushfire hazard level

- Extreme
- Moderate

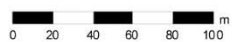


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www.strategen.com.au



**Figure 9 Fire Management Plan: Lot 306 McDonald Road, Baldivis**

Scale 1:4,000 at A4



Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 23/08/2016

Author: JCrute

Source: Aerial image: Neamap, flown 06/2016. Concept plan:

Client 07/2016. Existing cadastre: SLIP, Landgate 2016.

Path: Q:\Consult\2014\SP\SP14045\ArcMap\_documents\R001\Rev1\SP14045\_01\_R001\_Rev1\_F009.mxd



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www.strategen.com.au

The bush fire management measures were assessed to meet the performance criteria of the guidelines and are considered an appropriate and compliant response to the bush fire risk to future life and property. On this basis, Strategen considers that on implementation of the FMP, the proposed development will be adequately protected from bush fire.

## 5.5 Movement Network

The movement network proposed by the Structure Plan is consistent with the Baldivis (North) District Structure Plan and all documentation and supporting traffic studies associated with the approved Modified Baldivis North DSP. This Structure Plan relies on the provision of roads and drainage within the rural portion of Lot 306 (outside the Structure Plan area).

The Structure Plan fosters an interconnected and legible road network designed to achieve the following outcomes:

- Address Main Roads WA and City of Rockingham preliminary advice and requirements;
- Provide a direct and legible link from Structure Plan area to McDonald Road and Elderberry Drive;
- Provide a legible link to the future Neighbourhood Centre at the intersection of Kerosene Lane and McDonald Road;
- Ensure alternative access/egress options are available for safety reasons; and
- Enable ease of access (and egress) to the proposed community and commercial nodes.

### 5.5.1 Access

Access to the Structure Plan area will be provided from three key points along McDonald Road, and additional access to the north via the proposed Elderberry Drive (currently unconstructed).

The detailed Traffic Assessment is contained within **Appendix 7**.

#### 5.5.1.1 McDonald Road

McDonald Road is proposed to provide two key access points as follows:

- **Main Access** - is proposed to be located along McDonald Road central to the site. This road reserve is proposed to be 18.0m in width, with reduced verges where abutting POS. The main access will effectively be the Structure Plan area's main entrance and form the primary internal east-west connection. This road delivers residents and visitors alike to the principal area of POS located in the centre of the Structure Plan.
- **Southern Access** – is proposed to be located within the southern portion of the subject land. Access to the Structure Plan area via this road relies on the provision of road reserve within the rural portion of Lot 306 (outside the Structure Plan boundary).

The future extension of McDonald Road as a north-south *Neighbourhood Connector B* Road will be in conjunction with landholders to the east. An 18.0m road reserve is proposed, of which 6.0m is supplied within the Structure Plan area, with the balance provided by an adjoining landholder to the east.

#### 5.5.1.2 Elderberry Drive

Elderberry Drive proposed at the northernmost end of the Structure Plan area, will provide connection the proposed Nairn Drive in the east. Under the Baldivis North DSP this road was proposed to connect the Structure Plan area to Kerosene Lane to the north-west, however this connection will now be provided via McDonald Road.

The east-west *Access Road C*, Elderberry Drive will be developed in conjunction with landholders to the north. A 15.4m road reserve is proposed, of which 12.0 metres is supplied within the Structure Plan area while the balance provided by adjoining landholders to the north.

A controlled intersection, comprising a Left in/Left out configuration, will be located on Elderberry Drive at the eastern most Access D Street to ensure safe vehicle access. This controlled access arrangement is notated on the Structure Plan Map.

#### 5.5.1.3 Western Connection

A road connection from the subject land to cross the Parmelia Gas Pipeline has been proposed to provide a connection to the 'Urban' zone land west of the Structure Plan area.

## 5.5.2 Road Configuration and Hierarchy

The general road hierarchy is shown on **Figure 10** and **Figure 11** details the cross-sections specific to Lot 306). The proposed road configuration is based on a 'modified grid' system, which responds to the natural topography of the Structure Plan area.

The road reserves proposed within the Structure Plan area are as follows:

- 18.0m for 'Neighbourhood Connector B' roads
- 18.0m for 'Access Road B',
- 15.4m for 'Access Road C',
- 15.0m for 'Access Road D', and
- 6.0m for 'Laneways'.

Reduced verge widths may be permitted adjacent to POS subject to detailed review at the subdivision phase.

It should be noted that these reserve widths are indicative and may be subject to further adjustment during detailed subdivision design. The proposed internal road network ensures permeability and efficient traffic distribution throughout the Structure Plan area.

The road hierarchy, detailed in **Table 5**, is generally based on *Liveable Neighbourhoods* guidelines, however the proposed widths do vary slightly from standard cross sections.

**Table 5: Road Hierarchy**

Road Classification	Indicative road reserve width	Indicative road pavement width
Neighbourhood Connector B	18.0m	7.4m
Access Street B	18.0m	6.0m
Access Street C	15.4m	6.0m
Access Street D	15.0m	6.0m
Laneway	6.0m	6.0m

*\*All road reserve widths comply with Liveable Neighbourhoods and in some circumstances exceed the specified reserve widths.*

### 5.5.2.1 Neighbourhood Connector Road B

The typical road reserve for a *Neighbourhood Connector B* would comprise a 7.4m wide trafficable carriageway pavement and 5.3m wide verges.

### 5.5.2.2 Access Streets

The *Access Street B* road will function as an entry statement and provide a 6.0m wide trafficable carriageway pavement with 6.0m wide verges. The *Access Street C* road comprises a 6.0m wide trafficable carriageway pavement with wider verges at 4.7m. The typical road reserve for *Access Street D* roads comprises a 6.0m wide trafficable carriageway pavement and 4.5m wide verges. Where fronting POS, *Access Street* verges may be reduced to 2.5m depending on the location, services infrastructure and pedestrian network requirements.

### 5.5.2.3 Laneways

The typical road reserve for laneways entails a 6.0m wide trafficable pavement sufficient to allow two-way movements, rubbish collection, vehicle access into garages located on the rear of properties, flush kerbing and central drainage. Visitor parking for rear-loaded lot product is proposed to be provided to the side of the lots in close proximity to the POS.

## 5.5.3 Pedestrian and Cycle Network

The proposed 'permeable grid' road network creates an excellent opportunity for the provision of accessible and permeable pedestrian and cyclist amenities, maximising active transport within the Structure Plan area.

Pedestrian footpaths will be distributed throughout the Structure Plan area as depicted within **Figure 12** 'Indicative Path Network' Plan. The path network provides for a legible and accessible system of pedestrian access to focal points such as POS and the proposed Neighbourhood Centre. 'Shared Paths' (Dual Use Paths) are proposed within all *Neighbourhood Connector* roads and specific *Access Street* roads, and standard footpaths are proposed within all other lower order roads.

All roads will have a footpath or shared path on at least one verge throughout the Structure Plan area.

#### 5.5.4 Public Transport

The closest existing bus route to the Structure Plan area is Bus Route No. 568 from Warnbro Train Station, which currently terminates at Nairn Drive/Kingaroy Drive. The closest bus stops are located approximately 1.5km to the south of the Structure Plan area. Future proposed bus routes (refer **Figure 13**) expected to serve the Baldivis area include:

- The 'Western Route' – which is expected to run along McDonald Road and Fifty Road as well as along one of the Neighbourhood Connectors located between Nairn Drive and Baldivis Road. The outer terminus will most likely be in the vicinity of the District Centre at the corner of Safety Bay Road and Nairn Drive.
- The 'Eastern Route' – which is expected to run along Kerosene Lane and a (yet to be identified) Neighbourhood Connector running parallel to and to the east of Baldivis Road. This route will most likely terminate in the vicinity of the proposed Baldivis District Centre at the shared terminus with the Western Route.



## INTERNAL ROAD HIERARCHY

Figure 10



0 30 60 90m

Scale: 1:3000@A4 Date: 17/08/2016 Plan: SPGBD-5-0061

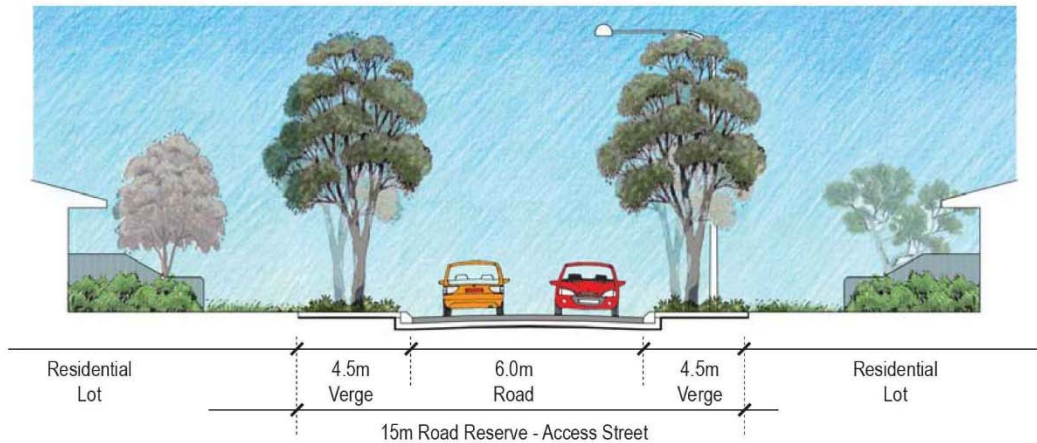


# LOT 306 McDONALD ROAD, BALDIVIS

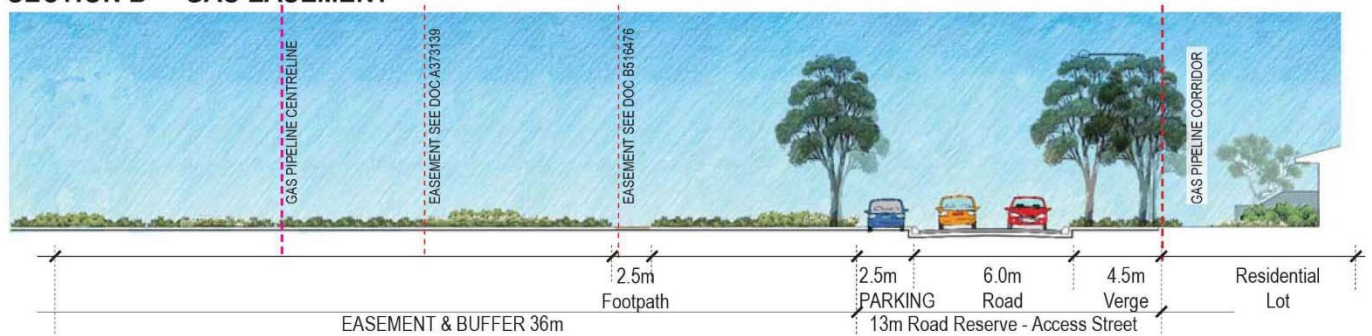
Figure 11

## TYPICAL SECTIONS

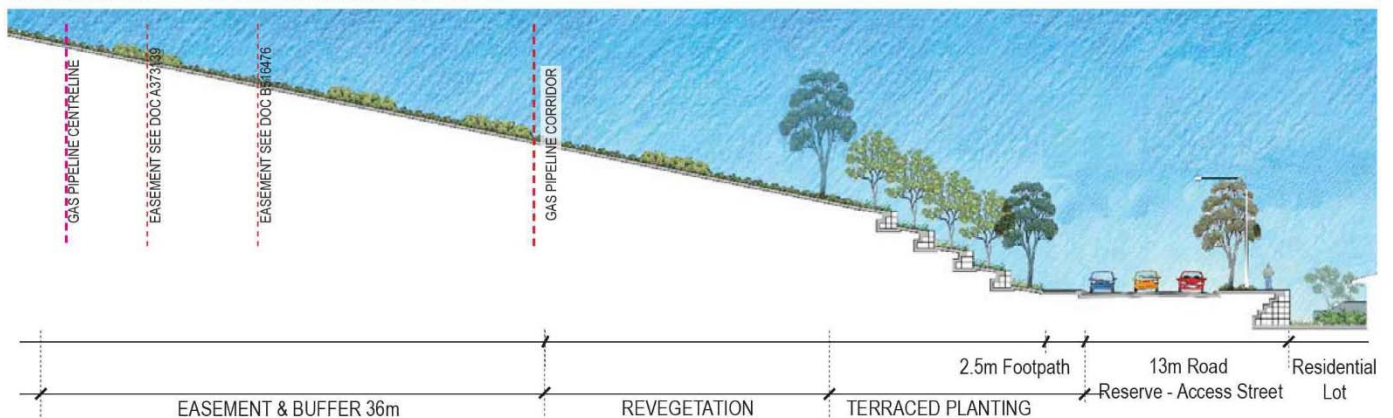
### SECTION A - 15m ROAD RESERVE



### SECTION B - GAS EASEMENT



### SECTION C - GAS EASEMENT & POS B



Meandering pathway connecting into broader network



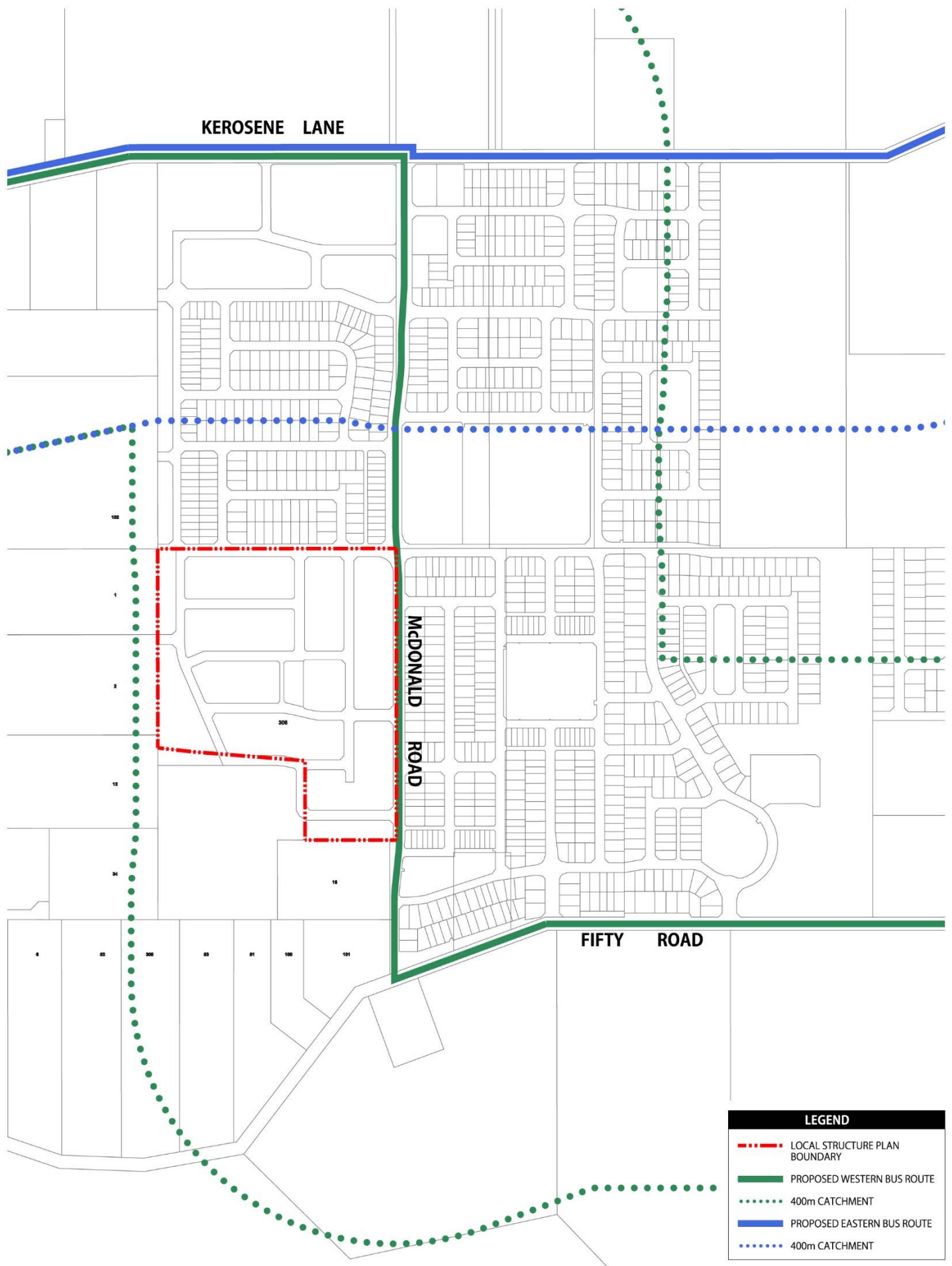
Linkage - Mark connection with adjacent developments



Planting - Low native planting in Gas Easement



**Creative**  
DESIGN+PLANNING



## PROPOSED BUS ROUTE

Figure 13



0 75 150 225m

Scale: 1:7500@A4 Date: 12/11/2015 Plan: SPGBD-5-007D



## 5.6 Public Open Space

The provision of a minimum of 10% POS is provided in accordance with the WAPC's *Liveable Neighbourhoods*. POS is to be provided generally in accordance with **Plan 1** under Part One of the Structure Plan; with POS credits provided in accordance with recently approved Structure Plan's within the City of Rockingham, as illustrated in **Figure 14**. All figures are rounded up for the purpose of the Structure Plan calculations and will be reviewed in detail at the Subdivision Design phase.

### 5.6.1 Public Open Space Overview

The Structure Plan proposes a total of three (3) areas of POS, two of which are within the Parmelia Gas Pipeline easement and buffer. The areas of POS are distributed and designed so as to create amenity and walkable recreation opportunities for future residents. Drainage will be accommodated outside the Structure Plan area, within the rural portion of Lot 306. Specific POS areas will retain mature trees (where practical based on further detailed survey, design and engineering). The total POS 'green space' proposed equates to ~ 12% of the gross subdivisible area, being a total of approximately 1.7ha. All public open space areas will be developed and landscaped to a high standard by the proponent for the benefit of the future community. The POS is evenly distributed throughout the Structure Plan area, resulting in all lots being located within walking distance.

POS credits have been calculated in accordance with recently approved Structure Plan's within the City of Rockingham. These calculations have been determined based on the following criteria:

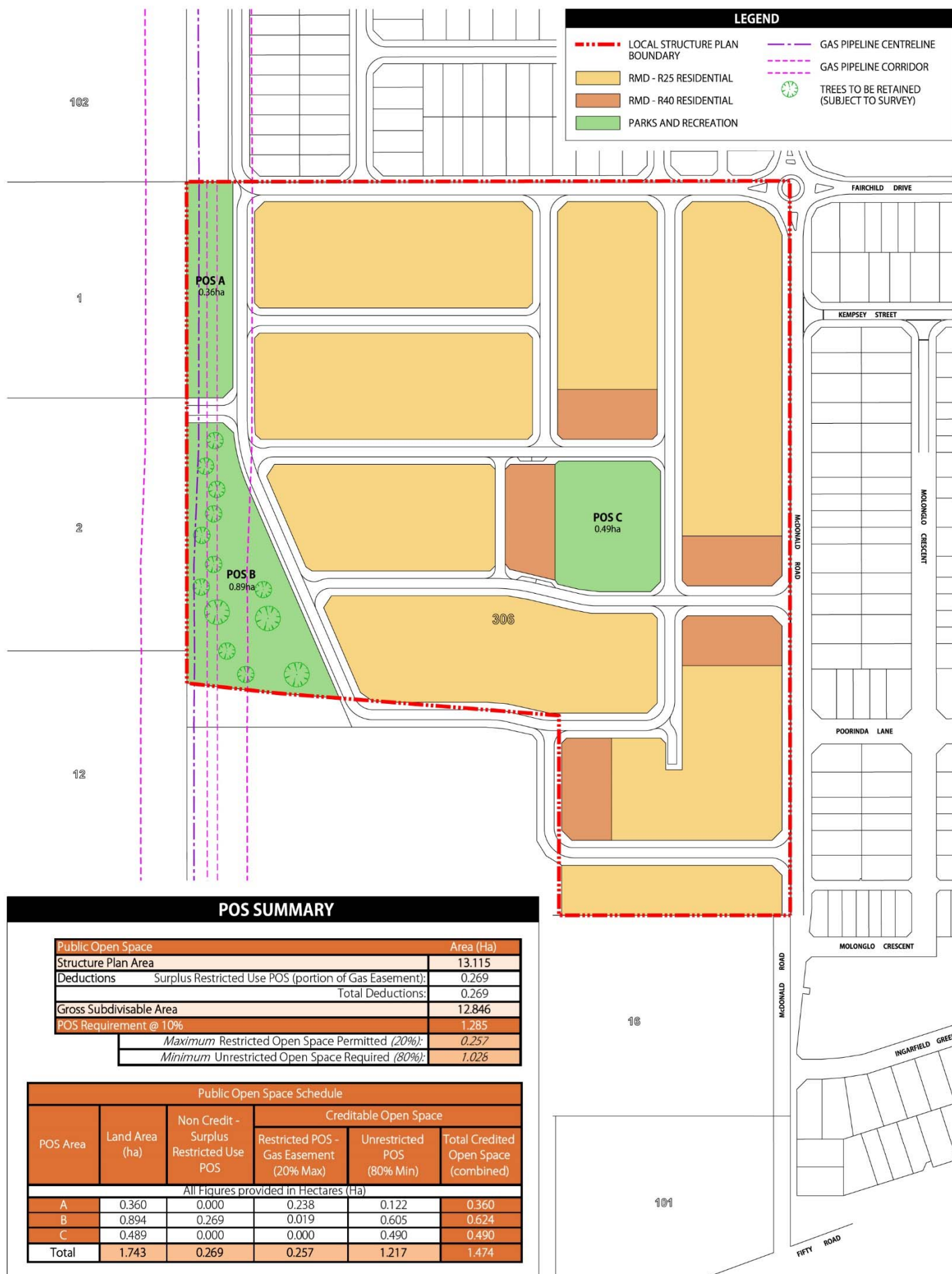
- Pipeline core/easement identified as restricted open space.
- Pipeline buffer identified as unrestricted open space (100% credit).
- Restricted open space to account for a maximum of 2% as per *Liveable Neighbourhoods*.
- Excess restricted POS applied as a deduction.

Subsequent to further detailed design and planning the POS schedule is to be updated at the time of subdivision and provided within the subdivision application for determination by the WAPC.

### 5.6.2 Public Open Space Function

A Landscape Strategy has been prepared by Emerge Associates in support of the Structure Plan. The Landscape Strategy is intended to be an overall guide to the proposed functions, amenities and landscape treatment within the Structure Plan area. A summary of the POS function is provided below. The detailed report is contained under **Appendix 8**.

**Figure 15** provides an overall guide to the proposed functions, amenities and landscape treatments.



## PUBLIC OPEN SPACE PLAN

Figure 14



0 30 60 90m

Scale: 1:3000@A4 Date: 18/08/2016 Plan: SPGBD-5-012F



# LOT 306 McDONALD ROAD, BALDIVIS

Figure 15

## LANDSCAPE & STREET TREE MASTER PLAN



### POS A

(Easement POS) includes:  
Pedestrian network connecting to estate and future adjoining landholdings.  
Revegetation to existing vegetation to be managed as a low fuel zone.

### POS B

(Easement POS) includes:  
Pedestrian network connecting to estate and future adjoining landholdings.  
Open turf area for passive recreation.  
Terraced retaining walls with formal planting

### POS C

(Central POS) includes:  
Pedestrian network connecting to pathway network within the estate.  
Open turf for active kickabout.  
Turf mounding with views that has shade structures and picnic facilities and provides informal seating.  
Main playground providing active recreation for kids aged between 5-12yrs old.

### STREET TREE SPECIES



Eucalyptus vitrix



Eucalyptus torquata



Pyrus calleryana

### LEGEND

— Estate Boundary

PLAYGROUND

WALK TRAIL

SHELTER

— Gas Easement Boundary

— Significant Trees to be Retained

PICNIC FACILITIES

NEW SHADE TREES

DRAINAGE BASIN

### 5.6.2.1 POS A (PASSIVE)

POS A is located in the north-west portion of the site, and is approximately 3,500m<sup>2</sup> in area.

The Parmelia Gas Pipeline easement runs north-south through this Park, and there is no drainage within this area of POS.

### 5.6.2.2 POS B (PASSIVE)

POS B is located in the south west portion of the site, and is approximately 8,900m<sup>2</sup>.

The Parmelia Gas Pipeline easement runs north-south through this Park.

There is no drainage within this park and it is proposed to retain existing trees within this POS where possible.

This POS area is intended to provide passive recreation as well as providing seating and picnic facilities. An exercise loop is proposed as part of the POS area which will consist of fitness equipment, open turf and stairs. The site topography will enable the proposed viewing platform to provide views across the estate as well enable passive surveillance.

### 5.6.2.3 POS C (ACTIVE)

POS C is located in the centre of the site, and is approximately 4,800m<sup>2</sup> in area.

This POS area will provide residents with an open space which caters for the local neighbourhood, predominately within 400m walking distance. A shelter, picnic table and BBQ will be provide for family and community group gatherings. An open turf kick about area surrounded by trees will provide for active recreation. The provision of a play space and nature play area have also been proposed for the local community.

## 5.7 Local Water Management Strategy

A Local Water Management Strategy (LWMS) has been prepared by Coterra Environment, separate to the Environmental Assessment Report (refer to **Appendix 9**). The LWMS has been prepared in accordance with the *Better Urban Water Management Guidelines* (DoW, 2008) and addresses the following:

- Identification of the current hydrological regime and existing environment of the subject land.
- Identification of the proposed water supply (including irrigation requirements) and wastewater disposal.
- Provide a description of the stormwater management strategy for minor and major events, including details on the proposed water sustainable urban design best management practises to be employed.
- Identification and description of mechanisms to protect the water regime, including water quality and water levels. This will include a discussion of the overarching engineering principles that will be employed to mitigate any impact from run-off and water issues, and ensure that the environment and the development will not be adversely impacted upon.
- Identification of monitoring requirements.
- Identification of contingency measures to be implemented in the event that pollution and nutrient removal, and stormwater detention are not achieving agreed performance targets.

## 6 INFRASTRUCTURE CO-ORDINATION AND SERVICING

The Engineering Services Report has been prepared by Development Engineering Consultants (DEC) which outlines that the land can be connected to all services, either by extension from new neighbouring subdivision developments east of McDonald Road, or by extension along Baldivis Road.

A summary of the Engineering Services Report is provided below, with the full report provided within **Appendix 10**.

### 6.1 Roads

All roads will be constructed to City of Rockingham standards. The lots abutting the road adjacent the gas line and the associated lots will need further detailed design to optimise design outcomes due to the steep road grades, interface with the POS, lot levels and access to them.

McDonald Road has been extended north by the adjacent development part way along the eastern boundary of the subject land. As part of an agreement between the adjacent developers to the east and north, and this proponent, McDonald Road is currently 12 metres in width, but a six metre widening will be created to make the future road reserve 18 metres in width.

Where roadways cross the pipeline easement, the profile of the road will be lifted to ensure that the required minimum cover over the pipeline is maintained at 1.2 metres as required.

### 6.2 Sewerage

The site falls within the catchment of the existing Baldivis North wastewater pumping station (WWPS's) on McDonald Road adjacent to the south east corner of the site.

Some fill will be required in the low areas to allow connection to the existing sewer. Connections can be made directly into existing sewers.

Ultimately the McDonald Road WWPS will accept discharge from the Baldivis Road WWPS, and will then pump directly to the new East Rockingham Waste Water Treatment Plant (ERWWTP), which is anticipated to be operational after 2015.

### 6.3 Drainage and Stormwater Management

The sandy soil characteristics of the site are conducive to soakage. Therefore all stormwater drainage will be retained with Lot 306 (outside of the Structure Plan area) via soakage swales, including the 1 in 100 year event.

The low point in the catchment has been designated as infiltration swales for the 1 in 5 year design storm, with additional capacity either in the swale itself or in the abutting land to contain the 1 in 100 year ARI storm.

A separate Local Water Management Strategy (LWMS) will be provided.

The proposed drainage system for the subdivision does not include accommodating drainage flows from McDonald Road as stormwater drainage from these has already been incorporated in adjacent developments.

All basins will have the maximum depth of water of 1.5m for the 1 in 100 year ARI storm, with the base of the basins a minimum of 0.5m above the AAMGL.

### 6.4 Groundwater

The lowest ground level on the site is a swale tending north east/ south west at approximately RL4.0 metres AHD in the southern portion of Lot 306 (outside the Structure Plan area). Base on the basin level the same location is at around RL4.0 metres AHD being which at least 2.0 metres above AAMGL.

### 6.5 Power

Sufficient power supply exists in the area to supply the development. A 22Kv aerial line is located in Fifty Road and along McDonald Road to the abutting development on the east side of McDonald Road. This development has reticulated underground power, with a transformer located in the southern portion of the site. There is existing underground reticulation in McDonald Road, which is currently being extended to the northern boundary of the subject land.

All aerial lines along the existing roads will be relocated underground in line with current WAPC approval policy at the cost of the developer. The existing aerial service lines inside the lot will be removed as part of the development.

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All internal power reticulation lines and transformer installations will be constructed at the cost of the developer. Transformer sites will be determined at the detailed subdivision design stage.

## 6.6 Telephone and NBN

The subject land will be serviced by the NBN or another provider for broadband and telephony. Capacity exists off Fifty Road and the adjacent development which may require minor extensions to facilitate connection.

## 6.7 Water Supply

At present there is reticulated water supply past the subject land in Fifty Road. There is an existing 250mm water main along the north verge of Fifty Road, and a connecting main in McDonald Road to the adjacent development.

The adjacent development east of McDonald Road has constructed a water main along the eastern verge of McDonald Road from Fifty Road to the northern boundary of the site. Connection to this development will therefore be made to the existing Water Corporation infrastructure.

## 6.8 APA Pipeline Easement

The Parmelia Gas Pipeline is located along and within the western boundary of the subject land.

The development setbacks from the pipeline must be in accordance with the requirements of *Planning Bulletin 87 – High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region* (refer **Appendix 3**) and Schedule 8 of the Scheme.

The subdivider will prepare and implement a Pipeline Risk Management Plan and a Pipeline Protection Plan detailing measures to ensure public safety and the protection of the high pressure natural gas pipeline, including completion of a risk assessment in accordance with AS2885 and implementation of measures required to ensure that the level of risk of future inhabitants of the subdivision is as low as is reasonable practicable.

This risk management assessment has been carried out for other developments in the area and it has been agreed with APA that higher risk land uses such as aged housing, schooling and neighbourhood centres will be removed from the higher risk locations. The planning for this development is cognisant of those requirements.

In December of 2014, a meeting was held with APA Group to discuss the proposed Structure Plan, correspondence confirming the outcomes of this meeting is enclosed as **Appendix 6**.

## 6.9 Gas

Gas services are located in Fifty Road and the adjacent development and have sufficient capacity to serve the area with minimal augmentation.

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## 7 IMPLEMENTATION

### 7.1 Earthworks and Retaining Walls

The subject land requires filling in the south eastern area of the site to facilitate sewer connection into the existing infrastructure in McDonald Rd. The fill levels vary, depending on the proximity of the site to the pumping station, but in general the eastern portion of the site will be filled to approximately RL 5.0 metres AHD to 6.0 metres AHD, some 3.0 metres above the AAMGL of 2.0 metres AHD.

Each lot will be finished level, with installation of retaining walls to suit. The retaining wall height is proposed to be restricted to 5.0 metres in height on side boundaries along the western road adjacent to the steep dunal ridge, and generally to 2.0 metres elsewhere, with a maximum of 5.0 metres heights to rear boundaries in order to provide the maximum amenity to lots without shading. Retaining walls will be constructed using reconstituted limestone blocks.

The design of the proposed earthworks are to be on a “cut to fill” balance, meaning that cut areas will need to be resolved to make up the shortfall of filling required, as per the levels illustrated within the ‘Lot Levels Plan’ (refer **Figure 16**).

Where roads join between land holdings with separate ownership, levels on the roads and lot boundaries will be either matched to existing level or co-ordinated to ensure that a staged development approach can be accommodated.





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