

EAST BALDIVIS DISTRICT STRUCTURE PLAN

OCTOBER 2012



PERRONGROUP

PEET



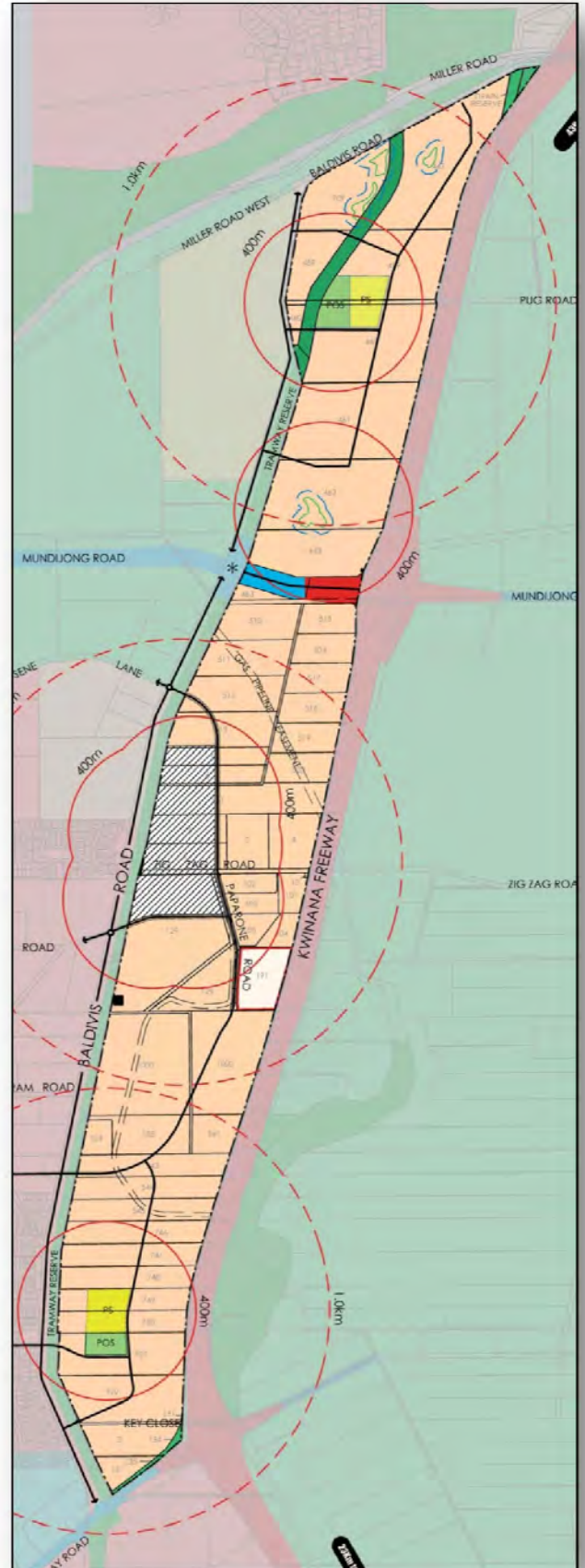
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EXECUTIVE SUMMARY

This District Structure Plan, hereinafter referred to as the *East Baldivis District Structure Plan* (EBDSP) has been prepared on behalf of the Baldivis East Stakeholder Team (BEST), an informal grouping of the major landowners within the proposed East Baldivis urban cell.

BEST was established in early 2006 to provide a basis for dialogue between landowners and provide for the coordinated preparation of an amendment to the Metropolitan Region Scheme and the District Structure Plan presented herewith.

The EBDSP area comprises approximately 376.5 hectares of land bounded by Millar Road to the north, Kwinana Freeway to the east, Safety Bay Road to the south, and Baldivis Road to the west.

The EBDSP has been prepared to coincide with a number of strategic and statutory planning initiatives and therefore co-ordinate urban development over the land.

The EBDSP seeks to provide the necessary planning framework for the project area which falls within the fast growing suburb of Baldivis, within the municipality of the City of Rockingham.

Executive Summary Development Table

Item	Data
Total area covered by the structure plan	376.5 hectares
Area of each land use proposed:	
- Urban (Residential, Open Space, Primary Schools etc)	361.1 hectares
- High School	9.5 hectares
- Freeway Service Centre	5.99 hectares
Estimated lot yield (comparative dwelling yield)	4581 lots
Estimated residential site density	12.7 dwellings per site hectare
Estimated population	12,800 people @ 2.8ppl/dwelling
Number of High Schools	1 High School
Number of Primary Schools	3 Primary Schools
Estimated number and size of open space areas:	
- Regional open space	NA
- District open space (Co-located with High School)	1 x 4 hectares
- Secondary open space (Co-located with Primary Schools)	2 x ~1.5 hectares

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1.0 INTRODUCTION

1.1 Purpose of this Report

This document has been prepared to validate a District Structure Plan (DSP) for the area generally bounded by Baldivis Road to the west, Kwinana Freeway to the east, Millar Road to the north and Safety Bay Road to the south. The study area is referred to as 'East Baldivis'. A location plan of the project area is provided in **Figure 1**.

The preparation of the DSP was initiated by virtue of fragmented land ownership and the need for a coordinated and comprehensive development proposal that fully integrated with surrounding developments. The DSP has been funded by and prepared on behalf of the combined East Baldivis land owners of which professional developers own a majority portion. The collaboration of these landowners is known as the Baldivis East Stakeholder Team ('*BEST*'). A land ownership plan illustrating the location and ownership of land within the project area is provided in **Figure 2**.

The primary objective of this document is to provide a district level structure plan which provides a framework and sets out the principles for the urban development of the study area. The DSP focuses on the physical arrangement of urban areas, primary road network, public transport, neighbourhoods, schools, open space, commercial activities and major infrastructure. The DSP provides the basis from which more detailed Local Structure Plans (LSP) are to be drafted as land owners proceed towards urban development. The timing of development is a decision that rests with each respective land owner.

This DSP has been prepared by a team of consulting town planners, engineers and environmental consultants in consultation with the City of Rockingham and all affected land owners.

1.2 Study Methods and Objectives

The project required the preparation of a DSP to guide the future urbanisation of the East Baldivis development cell. The DSP has been prepared having regard to:

- Physical and environmental assessment;
- Current practices and philosophies in urban planning, in particular *Liveable Neighbourhoods – Community Design Code*;
- WA Planning Commission policies and requirements;
- City of Rockingham planning policies and requirements;
- Requirements of State Government agencies;
- Structure planning undertaken over adjacent land holdings; and
- Aspirations of land owners.

The East Baldivis District Structure Plan (EBDSP) has been prepared to facilitate and enable quality development of the study area and provide for the logical growth of the south west corridor, addressing vital land supply demand.

The design approach has been a rigorous multidisciplinary process with a focus on excellence in urban design, achieving a sense of place and sustainability principles.

The main objective of the EBDSP is to provide a robust planning framework for the creation of a vibrant and sustainable new community. The EBDSP is a high level document which will be used to guide subsequent levels of more detailed planning, subdivision and eventual development.

The EBDSP forms the framework for more detailed Local Structure Planning which will develop over time to reflect changing planning and development trends, demographics, community needs and market demands. This document and the accompanying DSP Map (**Figure 8**) commences the first in a hierarchy of Structure Plans, establishing an overall district framework under which more detailed structure planning can occur.

Particular effort has been made in the preparation of this DSP to maximise the site's integration with the North Baldivis residential area and growing Baldivis Town Centre.

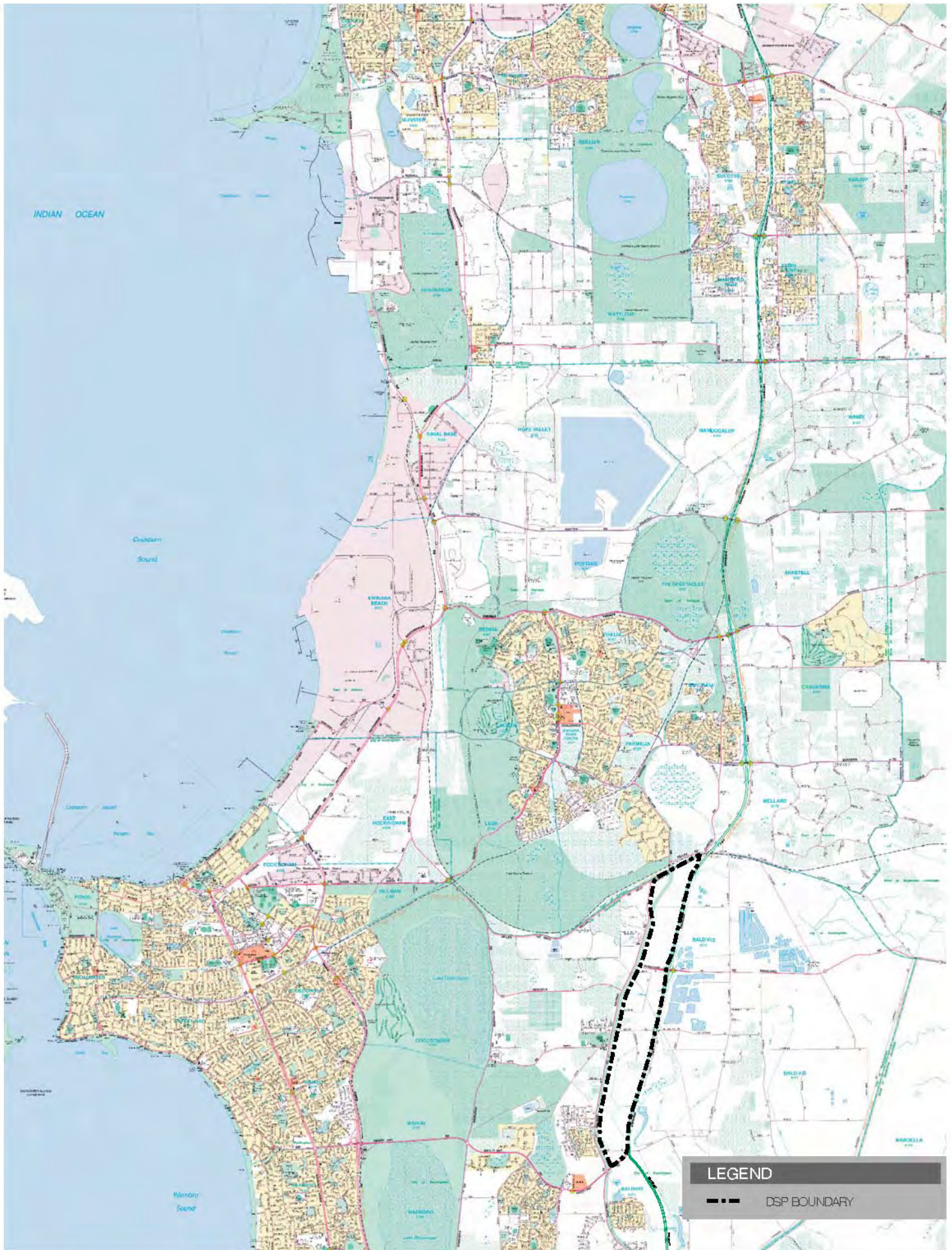
The general objectives of the DSP are to:

- Establish a framework for the location of major land uses, district and regional level road network and district level drainage requirements;
- Respect the identified physical environmental opportunities and constraints of the land and its surrounding context;
- Consider key infrastructure required for development;
- Reflect the objectives and aspirations of the local community;
- Ensure that landowners are dealt with in an equitable manner in terms of the provision of community infrastructure such as roads, schools, parkland and other community facilities; and
- Provide a district level framework incorporating orderly and proper planning upon which more localised Local Structure Plans can be prepared.

1.3 Study Team

The Study Team comprised:

- **Taylor Burrell Barnett (TBB)**
as project coordinators and town planners
- **RPS**
as project coordinators and town planners
- **Development Planning Strategies (DPS)**
as project coordinators and town planners
- **Greg Rowe and Associates (GRA)**
as project coordinators and town planners
- **Chappell Lambert Everett (CLE)**
as project coordinators and town planners
- **The Civil Group**
as civil engineering consultants
- **RPS Environment**
as project environmental scientist
- **Emerson Stewart**
as project hydrological consultants
- **Uloth and Associates and Move Consulting**
as project traffic engineering consultants
- **Herring Storer**
as project acoustic consultants
- **Tactics4**
as project commercial and community activity consultants
- **Bushfire Safety Consultancy**
as project bushfire management consultants



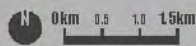
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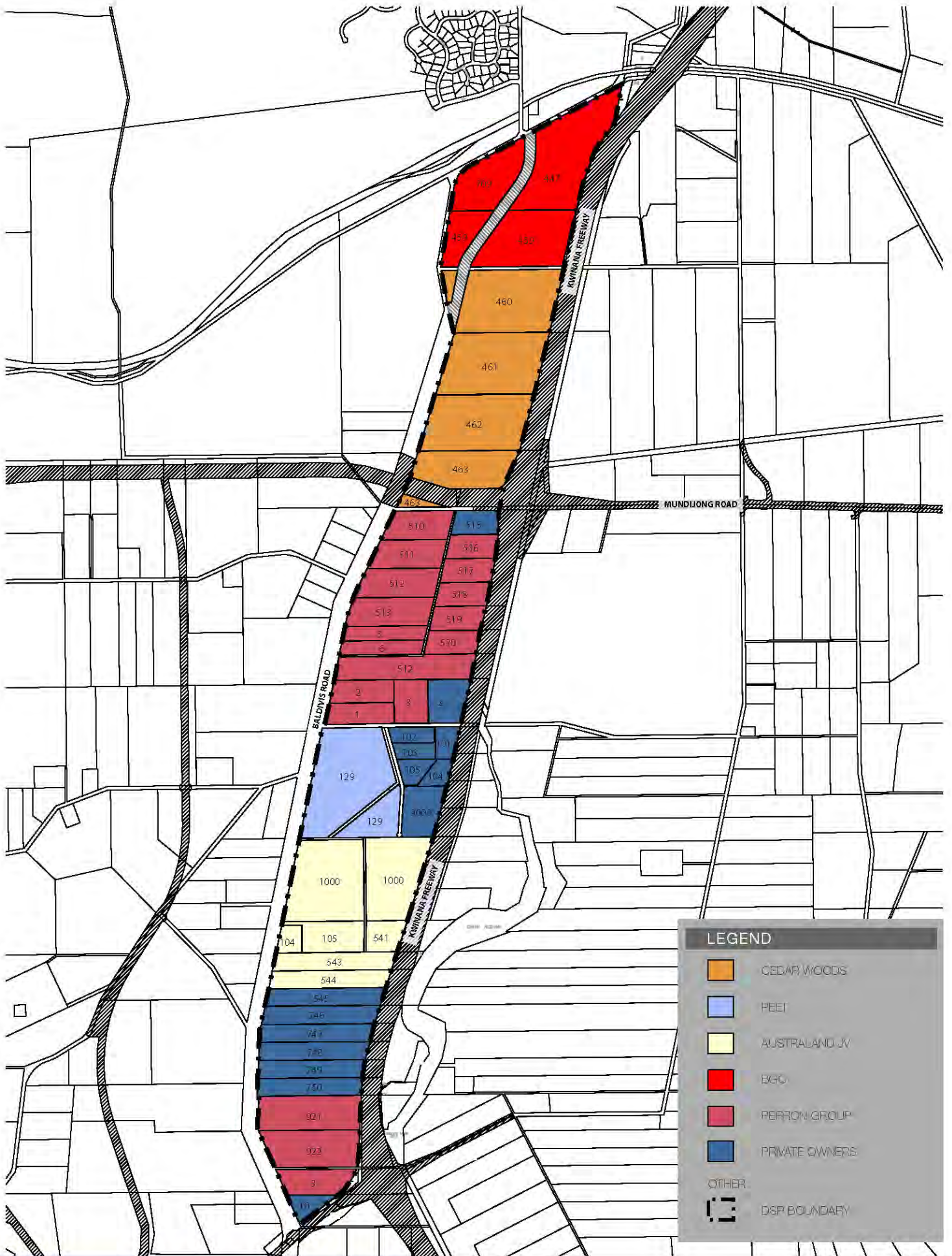
SUB REGION - LOCATION PLAN

East Baldivis District Structure Plan

A Joint Venture Project



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 d: Aug 2012
 j: 06/082



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- CEDAR WOODS
- PEET
- AUSTRALAND JV
- BIGO
- PERRON GROUP
- PRIVATE OWNERS
- OTHER
- DSP BOUNDARY

2.0 PLANNING BACKGROUND

2.1 Metroplan & Urban Expansion Policy Statement

Following the 1987 Corridor Plan Review, the then Department of Planning and Urban Development (DPUD) re-examined metropolitan growth patterns in the Metropolitan area and prepared METROPLAN – A Planning Strategy for the Perth Metropolitan Region (1990). Functioning as a Structure Plan for the Perth Metropolitan Region, this report was to serve as a guide for the direction of Perth's major growth areas until the year 2021.

METROPLAN reiterated many of the 'corridor' principles of the 1970 Plan, however also consolidated land between the various corridors, consistent with the Preferred Strategy (1987). An accompanying report to Metroplan, the Urban Expansion Policy Statement for the Perth Metropolitan Region (1990) served to provide a detailed description of future urban areas as well as an indication of timing of development.

A major growth area was nominated between the Kwinana Freeway and Lake Cooloongup and Lake Walyungup Regional Reserves. The East Baldivis area formed part of this major growth area classified as 'Future Urban'.

2.2 South West Corridor Structure Plan

The South West Corridor Structure Plan was released by DPUD in 1993 and provided a detailed framework identifying the future urban development areas of this corridor. The Structure Plan also considered the location and hierarchy of regional and district retail centres, major employment areas, proposals for regional open space and regional roads. The Structure Plan served as a link in the planning process as required by *METROPLAN*, to provide a guide and rationale to the preparation of major amendments to the MRS.

This Structure Plan identified all of the East Baldivis area as 'Rural'. Given the area is mostly low-lying and subject to inundation, the Structure Plan identified that the study area would not be suitable for urban development unless substantial drainage works were undertaken.

2.3 South West District Amendments 1127/41, 1128/41 and 1129/41

In October 2005, a proposed MRS Amendment to the area south of Zig-Zag Road ('*East Baldivis*') was submitted seeking rezoning of the land from 'Rural' to 'Urban'. In January 2007, a proposed MRS Amendment for the area north of Zig-Zag Road ('*Baldivis North*') was prepared also seeking to rezone the land from "Rural" to 'Urban'.

Following consultation with the WAPC and City of Rockingham, it was resolved to consolidate four proposed MRS Amendments, including the two abovementioned proposals, into one amendment proposal. On 29 January 2007, the WAPC advertised a proposal to amend the MRS – *Amendment No. 1127/41, 1128/41 and 1129/41 – East Baldivis*, being the three MRS Amendment areas subject of this DSP.

On 26 June 2009, the MRS Amendment was rezoned from 'Rural' to 'Urban Deferred' by Parliament. The rationale for the 'Urban Deferred' zoning was based on the following reasons:

- a) The Water Corporation recommended that the rezoning should not proceed until such time that the East Rockingham Waste Water Treatment Plant became operational in approximately 2015, having identified that current infrastructure services could not accommodate the East Baldivis development area in addition to already identified development areas in the district.
- b) The Water Corporation identified that the study area is within the Mundijong Drainage District which is currently constructed to a rural standard. Consequently the Water Corporation recommended deferral of an 'Urban' zoning until such time as detailed drainage management and other planning requirements are fulfilled.

- c) The Department of Water identified that the study area is in an area pending an already commenced substantial drainage project, being the Baldivis/Karnet Water Management Strategy. As the study is heavily constrained by drainage issues, the DoW considered these issues should be addressed prior to initiation of the MRS Amendment.

It is recognised that the most significant barrier to the 'Lifting of Urban Deferment' relates to Item a), however the BEST group will collaborate with the Water Corporation in ensuring that suitable sewerage infrastructure is in place to service the EBDSP area.

Once the above mentioned issue has been resolved, the 'Urban Deferment' can be lifted in accordance with the WAPC's Guidelines for the *Lifting of Urban Deferment Land*.

2.4 South West District Amendment 1229/27

In August 2011, the Australand-Bonvest (AHB) Joint-Venture submitted its own Lifting of Urban Deferment (LUD) request that included its entire East Baldivis landholding as well as Peet Ltd's Lot 129 Zig Zag Road landholding.

In January 2012, the Peet Ltd landholding was removed from the LUD proposal following written advice from the Water Corporation (October 2011) that it did not support inclusion of the Peet landholding in the current proposal. This was on the basis that Lot 129 was not included in the AHB's 'Land Servicing Strategy'.

The LUD report demonstrated that the various issues currently impeding development of the broader EBDSP cell did not directly affect the subject land parcel.

The WAPC's February 2012 endorsement to lift the 'Urban Deferment' zoning exclusively for the AHB Co-Venture landholdings was primarily in response to the site having access to service infrastructure (sewer); the primary issue impeding the broader East Baldivis cell. This was recognised by Water Corporation's July 2011 advice providing *in principle* support for the subject land to temporarily access the Kwinana WWTP via existing sewer services; provided in response to Australand's independent 'Land Servicing Strategy'. This report demonstrated that the first stages of the subject site could be fully serviced via the existing sewer infrastructure associated with the Baldivis North sewer pump station (on route to the Kwinana WWTP), thus ahead of the commissioning of the East Rockingham WWTP in 2015. The case was supported by the fact that the subject site was situated specifically within the agreed Baldivis North sewer pump station catchment area.

Amendment 1229/27 was gazetted on the 13th March 2012.

2.5 Metropolitan Region Scheme Zoning

The study area is generally zoned 'Urban Deferred' under the Metropolitan Region Scheme.

The Australand's Joint-Venture landholding is zoned 'Urban' under the Metropolitan Region Scheme.

The study area is situated immediately west of the Kwinana Freeway road reserve ('*Primary Regional Roads*') and north of Safety Bay Road ('*Other Regional Roads*'). Mundijong Road ('*Other Regional Roads*') traverses the centre of the study area. A 50 metre wide strip of land adjacent Baldivis Road Reserve is reserved '*Parks and Recreation*' reflecting the historic tramway reserve.

An MRS zoning plan is provided in **Figure 3**.

2.6 Local Authority Zoning

The northern and southern portions of the study area are zoned 'Rural' pursuant to the City of Rockingham Town Planning Scheme No. 2 (TPS2). The central portion of the study area is zoned 'Special Rural' under TPS2.

The Australand Joint-Venture landholding is currently the subject of Town Planning Scheme Amendment No. 122; rezoning the landholding from 'Rural' and 'Special Rural' to 'Development'.

Once the Urban Deferment under the MRS is lifted across the broader East Baldivis cell, it is anticipated that the remainder of the study area will also be rezoned to a 'Development' zone under TPS2.

Land zoned 'Development' under TPS2 requires all development to be subjected to a Council approved and WAPC endorsed Local Structure Plan, and at this time contributions can be levied for common infrastructure items if required.

Community services and infrastructure, including any education facilities and special use zones, will be in accordance with the relevant MRS zoning.

A TPS zoning plan is provided in **Figure 4**.

2.7 *Liveable Neighbourhoods*

Liveable Neighbourhoods was prepared by the Commission to implement the objectives of the State Planning Strategy, which aims to guide the sustainable development of Western Australia to 2029.

Liveable Neighbourhoods creates a policy framework for structure planning, development and subdivision in accordance with the concepts of 'new urbanism', whereby urban design principles are utilised with the objective of the creation of communities. Consequently, *Liveable Neighbourhoods* provides a framework to facilitate the development of sustainable communities.

Liveable Neighbourhoods provides the guiding urban design principles on which the East Baldivis study area is to be planned and developed. Each of the 12 Principal Aims of *Liveable Neighbourhoods* have been broadly addressed by this District Structure Plan and will be further examined by Local Structure Planning documents.

The DSP is consistent with the principle aims of *Liveable Neighbourhoods* as follows:

- To provide for an urban structure of walkable neighbourhoods clustering to form towns of compatible mixed uses in order to reduce car dependence for access to employment, retail and community facilities.
- To ensure that walkable neighbourhoods and access to services and facilities are designed for all users, including users with disabilities.
- To foster a sense of community and strong local identity and sense of place in neighbourhoods and towns.
- To provide for access generally by way of an interconnected network of streets which facilitate safe, efficient and pleasant walking, cycling and driving.
- To ensure active street-land use interfaces, with building frontages to streets to improve personal safety through increased surveillance and activity.
- To facilitate new development which supports the efficiency of public transport systems, where available, to provide safe, direct access to the system for residents.
- To facilitate mixed use urban development which provides for a wide range of living, employment and leisure opportunities capable of adapting over time as the community changes, and which reflects appropriate community standards of health, safety and amenity.
- To provide for a variety of lot 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 the avoidance of key environmental areas and the incorporation of significant cultural and environmental features of the project area into the design of an area.
- To provide for a more integrated approach to the design of open space and urban water management.
- To ensure cost effective and resource efficient development to promote affordable housing.
- To maximise land efficiency wherever possible.

2.8 Network City

Baldivis is part of a larger area that is identified in Network City (NC) for 'future communities that are designed around networks and centres'. More specifically, the East Baldivis land is shown as a desirable urban expansion area.

The study area's favourable status under NC is testament to its potential to accommodate future urban growth, whilst being strategically located such that it can integrate with the existing urban fabric and maximise the value of the physical and social infrastructure that has been developed and/or is planned for the locality. This will provide a better standard of amenity for future residents.

2.9 Directions 2031 – Draft Spatial Framework for Perth and Peel

Introduced to the Western Australian Planning System in June 2009, the draft Spatial Framework for Perth and Peel is a high level strategic plan that establishes a vision for future growth of the Perth and Peel region; and provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate that growth.

Broadly defined in this report, the EBDSP area is located within the South-West Sub-Region, which encompasses the Cockburn, Rockingham and Kwinana Local Governments.

By 2031, the population of this sub-region is expected to grow by 70,000 people to a total 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 Strategy's aim is to have 70% of the total workforce employed locally.

The EBDSP area is located within the 'North-East Baldivis' section of the South-West sub-region. Whilst the entire EBDSP site itself is identified as 'Rural' in the Directions 2031 document, the draft document required updating to reflect the recently rezoned status of the subject land to 'Urban Deferred' (gazetted of MRS amendment, June 2009).

The broader area to the west and east (north of Mundijong Road) is listed as 'Under Investigation - Industrial'. This area '...has been nominally identified as one of several potential future sites for industrial land use as part of the draft industrial land strategy for the Perth Metropolitan and Peel Regions'. This proposed industrial land use will also need to be updated in the relevant Directions 2031 documents; such revisions as identified in the following sections of this report.

Mundijong Road, within the northern section of the EBDSP area, '... is classified as an Other Regional Road for its entire length from the South West Highway to Rockingham. A proposal is currently under consideration to connect Mundijong Road directly into the Fremantle Rockingham controlled access highway to improve access into the various industrial complexes.'

2.10 Outer Metropolitan Perth and Peel, Sub-Regional Strategy

Released for public comment in August 2010, the *Outer Metropolitan Perth and Peel, Sub-Regional Strategy* (OMSRS) provides a framework for the delivering of 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.

Situated within the South-West sub-region, the BEST landholding south of Mundijong Road is identified as an 'Urban Deferred Zoned Undeveloped' site. Referenced as 'BA4' in the South-West sub-region spatial framework map, this site is expected to yield approximately 3,200+ dwellings, based on a 'Connected City' development model of 15 dwellings per gross urban zoned hectare; or 2,100 dwellings based on a 'business as usual' scenario of 10 dwellings per gross urban zoned hectare.

The strategy acknowledges that *Liveable Neighbourhoods* prescribes approximately 65 per cent of land as generally available for residential development. Notwithstanding this, the strategy increased the land available for residential development to 75 per cent to compensate for variance in scale.

While this assumption is considered to be a conservative approach by the WAPC, it is acknowledged that the East Baldivis site has several physical restrictions (e.g. drainage, gas pipeline) and public infrastructure expectations (e.g. 3 x primary and a secondary school within a constrained linear configuration land parcel) that have not been taken into consideration in this strategic document. Consequently, dwelling projections are lower (albeit marginally) than the projected yield expected for the East Baldivis 'BA4' landholding, and similarly for the area north of Mundijong Road. This issue highlights some dwelling projection inconsistencies in this strategic document; however this issue will be rectified pending the endorsement of the EBDSP by the City of Rockingham and WAPC.

In regard to the EBDSP landholding north of Mundijong Road, this portion of the site is still identified as a 'priority industrial site – subject to investigation' – forming part of the proposed North East Baldivis industrial site. Following the public submission period for the Industrial Land Strategy 2009 (refer section 2.11 below), the WAPC have since acknowledged the progress of the East Baldivis District Structure Plan by BEST and the City of Rockingham for, primarily, residential purposes. The WAPC has also recognised the various development constraints of the land parcel west of Baldivis Road for industrial purposes. Consequently, the WAPC has since revised the ILS document, now referred to as the *Economic and Employment Lands Strategy: non-heavy industrial, Perth Metropolitan and Peel Regions (April 2012)* to include only the area east of the Kwinana Freeway for industrial purposes. The *Directions 2031* and accompanying documents, and *Southern Metropolitan and Peel Sub-Regional Structure Plan* will also be amended accordingly, identifying the BEST land as 'Urban Deferred Zoned Undeveloped' consistent with the southern portion of the BEST landholding.

2.11 WAPC: State Planning Policy – Activity Centres for Perth and Peel

Referenced in conjunction with the Directions 2031 document, the draft SPP – Activity Centres for Perth and Peel (SPP_AC) is a document specifying broad planning requirements for the planning and development of new activity centres, and the redevelopment and renewal of existing activity centres in urban areas of Perth and Peel.

It is primarily concerned with the location, distribution and broad land use and urban design criteria for activity centres, and coordinating their land use and infrastructure planning by local governments and public authorities.

The southern portion of the EBDSP is within walking distance of the Baldivis District Town Centre, therefore pursuant to the objectives of this Policy, medium/mixed density residential will be encouraged in proximity to the centre.

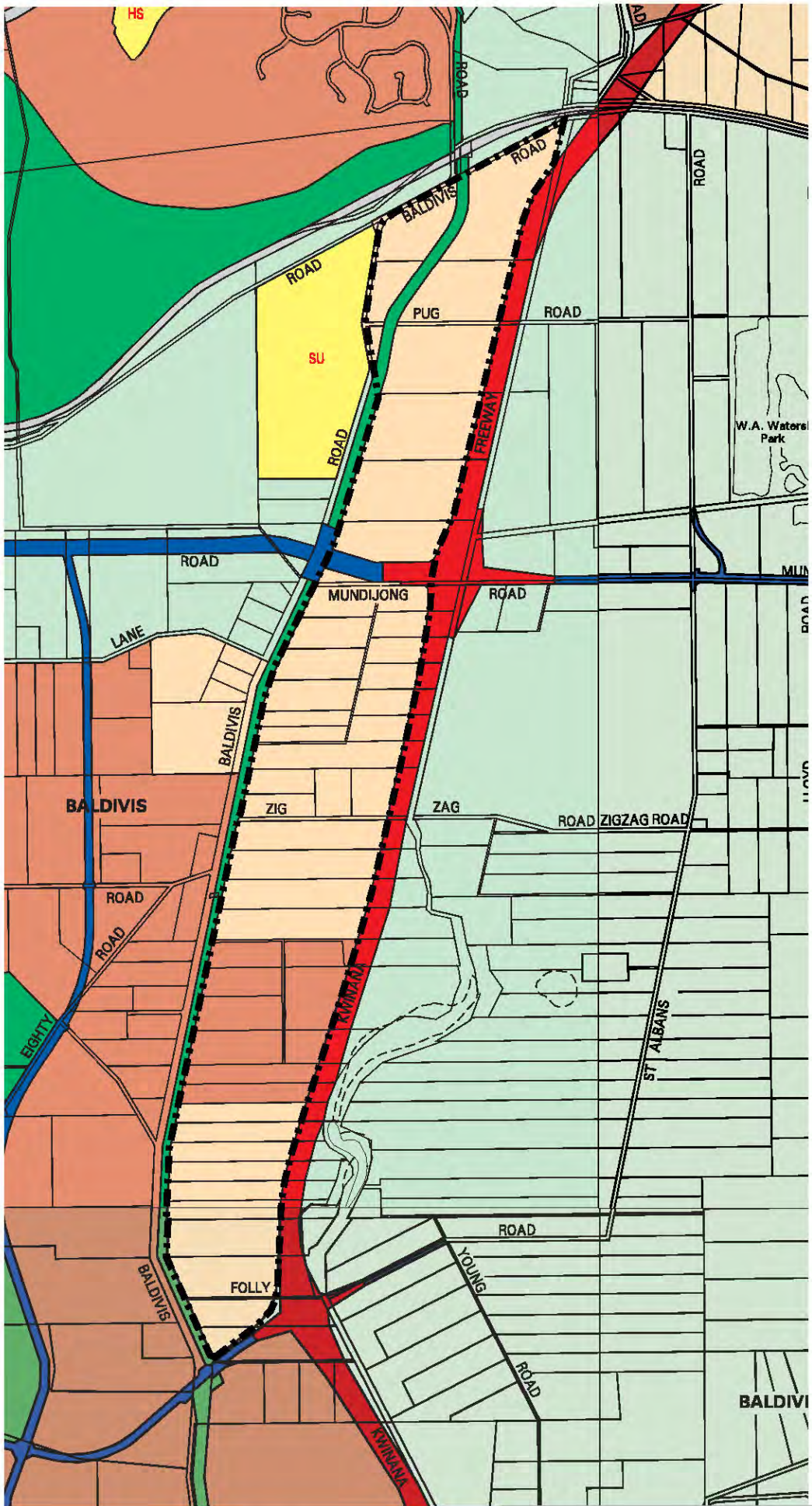
2.12 Industrial Land Strategy 2009 – Perth and Peel

In November 2009, the Department of Planning released the *Industrial Land Strategy – Perth and Peel (ILS)*, with a mandate to remedy the recognised shortfall in industrial land supply in Perth and Peel Regions by identifying strategic locations for industrial land required for the State's continued growth for the next 20 years. The document identifies six key future 'priority sites' selected on the basis of various criteria as the centrepiece of addressing the emerging crisis.

The northern section of the project area, effectively the portion located between Mundijong Road and Telephone Lane, was included as part of the "North East Baldivis" priority site in the ILS document. Directions 2031, Perth and Peel's high level strategic planning document identifies the project area as "Under Investigation – Industrial". The *Southern Metropolitan and Peel Sub-Regional Structure Plan* released in June 2009 by the WAPC also identifies the project area as "Industrial".

Following the public submissions period for the ILS, the WAPC have since acknowledged the progress of the East Baldivis District Structure Plan by BEST and the City of Rockingham for primarily, residential purposes. The WAPC has also recognised the various development constraints of the land parcel west of Baldivis Road for industrial purposes. Consequently, the WAPC has amended the final (adopted) version of the ILS document to include only the area east of Kwinana Freeway for industrial purposes – forming the *North East Baldivis priority industrial site*. The adopted report is referred to as *Economic and Employment Lands Strategy: non-heavy industrial, Perth Metropolitan and Peel Regions (April 2012)*.

The *Directions 2031* and *Southern Metropolitan and Peel Sub-Regional Structure Plan* will also be amended accordingly, identifying the BEST land as future urban development.



LEGEND

RESERVED LANDS

- PARKS AND RECREATION
- RAILWAYS

ROADS

- PRIMARY REGIONAL ROADS
- OTHER REGIONAL ROADS
- PUBLIC PURPOSES -
- SU SPECIAL USES

ZONES

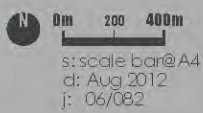
- URBAN
- URBAN DEFERRED
- RURAL

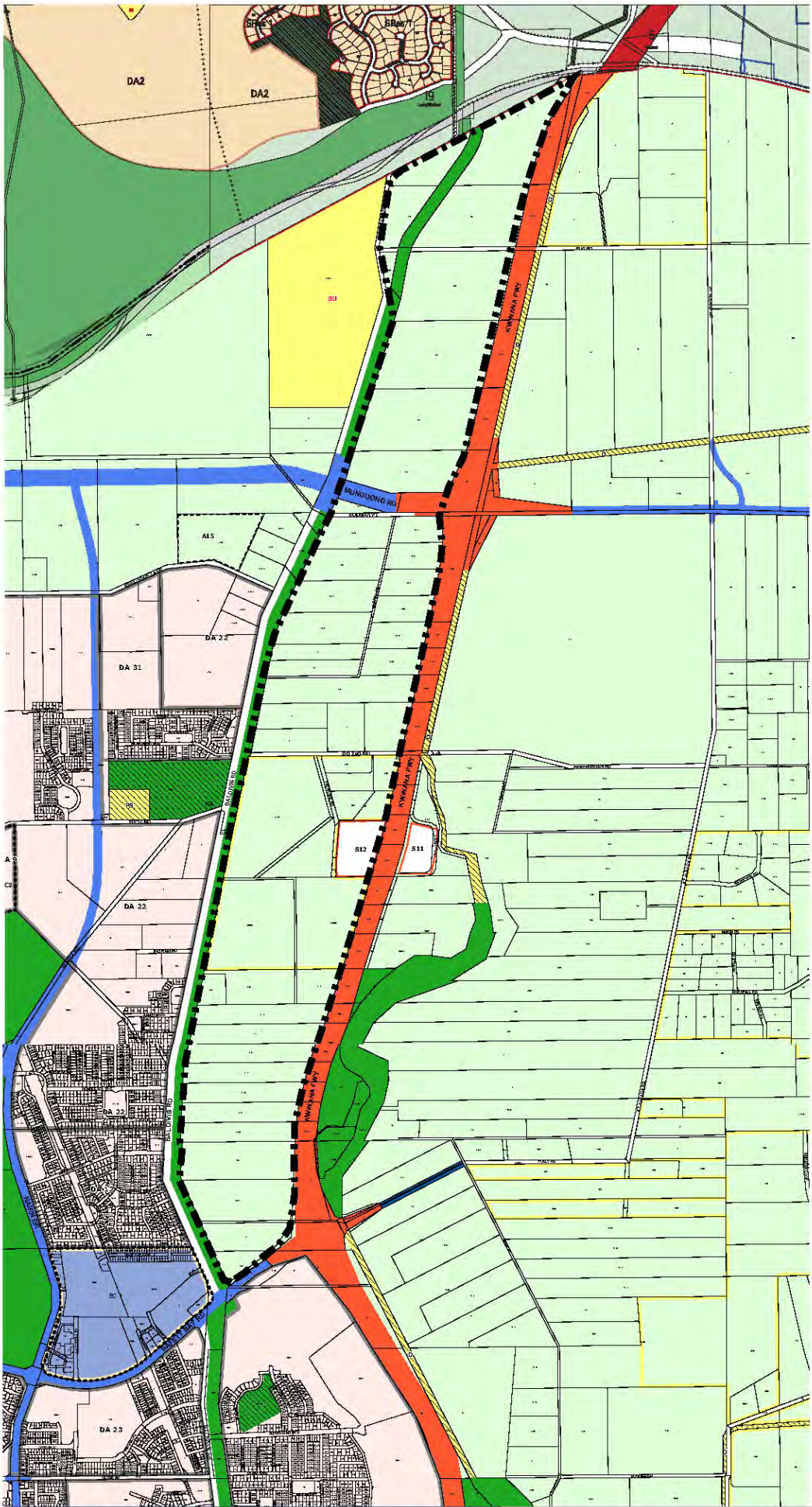
DSP BOUNDARY

METROPOLITAN REGION SCHEME

East Baldvis Structure Plan

A Joint Venture Project





- LEGEND**
- METROPOLITAN REGION SCHEME RESERVES**
- PARKS AND RECREATION
 - PRIMARY REGIONAL ROADS
 - OTHER REGIONAL ROADS
 - PUBLIC PURPOSES - DENOTED AS FOLLOWS:
 - SU SPECIAL USES
 - HS HIGH SCHOOL
- LOCAL SCHEME RESERVES**
- LOCAL ROADS
 - PUBLIC OPEN SPACE
 - PUBLIC PURPOSES DENOTED AS FOLLOWS:
 - D** DRAIN
- ZONES**
- DEVELOPMENT
 - RESIDENTIAL
 - SPECIAL RESIDENTIAL
 - BALDIVIS TOWN CENTRE
 - RURAL
 - SPECIAL RURAL
 - CLUSTER/COMMUNAL RURAL SETTLEMENT
- OTHER**
- 2** SPECIAL USE AREA (SEE SCHEME TEXT)
 - AI** ADDITIONAL USES
 - SCHEME BOUNDARY
 - LOCAL GOVERNMENT BOUNDARY
 - DA1** DEVELOPMENT AREA (SEE SCHEME TEXT)
 - EC2** ENVIRONMENTAL CONDITIONS (SEE SCHEME TEXT)
 - NO ZONE
 - DSP BOUNDARY

3.0 EXISTING ENVIRONMENT

3.1 Location and Ownership

The project area is located approximately 40 kilometres to the south west of Perth's Central Business District, within the City of Rockingham.

The East Baldivis District Structure Plan area (EBDSP) extends over a total area of approximately 376.5 ha and is located immediately west of the Kwinana Freeway.

Peet Limited, Australand Joint Venture and more recently BGC, Cedar Woods and Perron Group, comprise the main landowner group (BEST), and are the active proponents of the EBDSP as illustrated in the land ownership plan provided in **Figure 2**.

Several landholdings within the EBDSP area are held in private ownership, and are not actively involved in the EBDSP process.

3.2 Land Use Overview

A review of the historical Certificates of Title and aerial photography for portions of the site was conducted by Cardno BSD and RPS BBG in March 2006. This review revealed that it was not possible to find evidence for any other significant land use apart from that of broad scale agriculture having occurred on site.

3.2.1 *Existing Land Use*

The project area is currently zoned 'Urban Deferred' or 'Urban' (Australand Joint-Venture) under the Metropolitan Region Scheme (MRS). From the historical aerial photography search and a review of the current aerial photography and site inspections, it is confirmed that the site is still being used predominantly for agricultural purposes but on a smaller scale, except for the landholdings bounded by Mundijong Road to the north, Kwinana Freeway to the east, Zig Zag Road to the south and Baldivis Road to the west, which are vacant and unutilised.

3.2.2 *Surrounding Land Use*

The landholding is adjacent to the Kwinana Freeway. Standards set by various regulatory authorities require noise levels to meet neighbourhood noise criteria for residential areas.

The Rockingham Regional Memorial Park is located immediately west of the site on the corner of Millar Road and Baldivis Road. A sand quarry is located to the immediate south of this site.

A poultry farm and market garden are located on the western side of Baldivis Road adjacent to the southern half of the site. Numerous premises containing horse stables are located within and near to the site.

The Tramway Nature Reserve runs parallel to Baldivis Road along the western boundary of the site and contains patches of vegetation in good condition, with some evidence of disturbance and weed growth. The City of Rockingham recommends limiting the number of crossings to Baldivis Road across the Tramway Reserve.

3.3 Physical Environment

An Environmental Assessment Report (EAR) has been prepared by RPS Environment and is provided in **Appendix 1**. The EAR provides a comprehensive assessment of the physical environment within the project area. A brief summary of the EAR is provided as follows:

3.3.1 *Topography and Soils*

The site is undulating with several roads dissecting it. The topography of the project area ranges from 4 m AHD to 10 m AHD with the soils on site comprising the Serpentine River soil and landform unit.

Four Geotechnical reports have been carried out for areas within the project area. These reports were carried out for:

- Lots 3, 921 and 922 Baldivis Road (Coffey Geosciences Pty Ltd, 2006).
- Lots 447, 449 and 709 Pug Road (Douglas Partners, 2008a).
- Lots 460 to 463 Baldivis Road (Douglas Partners, 2008b).
- Lots 1 to 6, 510 to 513, 515 to 521 and 463 Baldivis and Zig Zag Roads (Douglas Partners, 2008c).

Based on existing mapping, the potential for Acid Sulfate Soils (ASS) across the project area was deemed to be moderate to low risk of occurring within three metres of the surface (DEC, 2009). The risk of disturbing ASS ultimately depends not only on the risk characteristics but also on the nature of the urban development itself.

Based on risk mapping there is unlikely to be significant ASS issues associated with the upper soil profile. Issues that may become apparent in relation to the installation of underground services or other subdivision earthworks will be adequately managed through the planning process.

Previous reports on the geotechnical and preliminary Acid Sulfate Soil investigations on sections of the project area (Douglas Partners, 2008 a, b and c) reveal the possibility of the occurrence of Actual Acid Sulfate Soil (AASS) or Potential Acid Sulfate Soil (PASS) is high in some areas and that further investigation should be completed before site works commence.

3.3.2 *Wetlands and Surface Hydrology*

NORTH OF ZIG ZAG ROAD

The vast majority of the project area is classified as 'Multiple Use' Palusplain, according to DEC wetland mapping. Two small areas classified as 'Resource Enhancement' (REW) Palusplain are present on the site. These areas are located approximately 250m north of Mundijong Road and 150m south of Telephone Lane, respectively. The North-East Baldivis DWMS (Parsons Brinkerhoff, 2009) proposed to retain these REW areas within POS and incorporate them into the drainage infrastructure for the project area. The option to retain the REW for such purposes will be subject to further environmental review at the Local Structure Planning phase.

The project area is very flat, with elevation ranging between 4m AHD to 6m AHD across the majority of the site. Two dunes are present near Zig Zag Road, where elevations locally increase to 10-11m AHD. Several existing culverts are present along the eastern boundary of the project area, to convey surface runoff from the site to the Peel Main Drain. These culverts, which cross the Kwinana Freeway, range in diameter from 450mm to 750mm.

SOUTH OF ZIG ZAG ROAD

Approximately 50% of the project area is classified as 'Multiple Use' Palusplain, according to DEC wetland mapping. The remainder of the site is not classified in the wetland mapping. Several open drains are present, predominantly running north-south through the site, which are proposed to be retained within a central POS corridor.

The project area is predominantly flat, with elevations ranging between 4m AHD in low-lying areas near the centre of the site to 11mAHD at dunes located near the north-eastern and western boundaries of the site. Two open drains traverse the low-lying areas of the site – the first, known as

the Sub H Branch Drain, runs from Zig Zag Road through to Lot 545 Baldivis Road, and drains the majority of the site to the Peel Main Drain via a 1050mm diameter culvert. The second open drain, known as the Sub F Branch Drain, traverses the southern portion of the site, and discharges via a 450mm diameter culvert to the Peel Main Drain. Two other culverts, a 600mm diameter culvert near Zig Zag Road, and a 450mm diameter culvert near the boundary of Lot 541 and Lot 543, convey runoff from smaller catchments to the Peel Main Drain.

3.3.3 Groundwater

NORTH OF ZIG ZAG ROAD

Existing groundwater levels occur very close to ground level across the majority of the project area. Maximum groundwater levels vary from <1m below ground level in the low-lying areas of the site to 5m below ground level at the dunes near Zig Zag Road. A small area of the site is particularly low-lying and is subject to seasonal inundation.

SOUTH OF ZIG ZAG ROAD

Existing groundwater levels occur very close to existing ground level across most of the project area. Maximum groundwater levels vary from <1m below ground level in the central low-lying areas to 5m below ground level in the elevated areas in the north and south of the site. Preliminary estimates of Average Annual Maximum Groundwater Level (AAMGL) have been made in the East Baldivis DWMS (PB, 2007). Areas of the site which are particularly low-lying are subject to seasonal inundation during peak groundwater periods.

3.4 Biological Environment

Review of aerial photography confirms that there are few areas of remnant vegetation within the project area. As a result of the historical land uses (agricultural activities) the majority of the site has either been partially or completely cleared.

The main intact area of remnant vegetation remaining at the site is located within Lots 1 and 2 Baldivis Road. Scattered vegetation is also present in other locations but with limited understorey present (if any).

Two Bush Forever sites are located in proximity to the project area. One is to the east of the Kwinana Freeway and the other is located to the west of the site. The Bush Forever Site to the east of the Kwinana Freeway is Site 418, Folly Pool, Baldivis. The Bush Forever Site located to the west of the site is Site 356, Lake Colloongup, Lake Walyungup and Adjacent Bushland, Hillman to Port Kennedy. As these sites are not immediately adjacent to the site, they are not considered a constraint upon development.

No detailed fauna survey has been conducted as part of the EAR investigation. However, the majority of the project area has been cleared and as a consequence fauna habitat has been largely removed. Opportunistic fauna may utilise vegetated areas within the site, although surrounding uncleared bushland would provide more significant habitat areas.

3.5 Potential Contamination

A search of the Department of Environment and Conservation's Contaminated Sites Database on the 22 April 2008 identified four potentially contaminated sites ranging from approximately 750 m to approximately 2.5 km in distance from the site. These sites are all located to the west of the site and are either hydrologically down or across gradient from the site and as such, they pose little risk to the site (Cardno BSD, 2006).

3.6 Heritage

A search of the Department of Indigenous Affairs (DIA) Database on 14 April 2009 showed no registered Aboriginal heritage sites within the subject area. However, five Aboriginal Sites are located in the vicinity of the site. These are: an Artefacts Scatter Site located within the Folly Pool Bush Forever Site. Three Artefact Scatter Sites located along Baldivis Road and an Artefact Site located to the north of the site.

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 that a potential site is discovered, all work in the area will cease and the DIA will be contacted.

3.7 Potential Impacts and Management

The EAR provided by RPS Environment discusses the potential impacts of the preceding factors, and the method in which these impacts can be managed. The EAR also addresses the comments provided by the EPA in response to the MRS amendment. In summary, the environmental impacts of the urbanisation of the project area can be readily managed without any adverse impact on the environment. In this regard, the EBDSP, which is described in further detail in Chapter 6 of this report, has regard to the issues addressed in the EAR.

4.0 CONTEXT ANALYSIS

4.1 Overview

The subject land has been rezoned to allow for the urban development of the land. Under the Metropolitan Region Scheme (MRS) the land is now generally zoned 'Urban Deferred' (or 'Urban' for Australand's Joint-Venture landholding).

The land is predominantly zoned 'Rural', with a portion of land zoned 'Special Rural', and is described as "*mostly low lying and subject to inundation*" and "*not suitable for urban development without substantial drainage works*" within the City of Rockingham Rural Land Strategy.

The viability of drainage for urban purposes, continuing population growth and the proximity of the land to the new rail stations, urban services and major recreation resources has driven the rezoning of the land to 'Urban Deferred' by the Western Australian Planning Commission (WAPC). Furthermore the expansion of the existing Baldivis urban area is considered consistent with the key objectives of the *Directions 2031* Strategic document.

Figures 5 and 6 provide a graphic representation of the site in its regional and local context.

4.2 Regional Roads – Existing

Within the vicinity of the Structure Plan area, there are two existing major roads recognised under the MRS. These are the Kwinana Freeway running north-south and located east of the Structure Plan area which is reserved as a "Primary Regional Road" and Mundijong Road which is located within the northern portion of the Structure Plan area and is reserved as an "Other Regional Road".

Baldivis Road also provides a major road function and runs parallel to Mandurah Road forming the western boundary of the Structure Plan area. Baldivis Road primarily plays a district distributor role however, since the extension of the Kwinana Freeway, the section adjoining the study area has been downgraded as a reliable short cut for travellers heading to Mandurah and beyond. Baldivis Road has a varying 20 - 30m wide road reserve, and is immediately adjoined by a 60m wide 'Parks and Recreation' Reserve (Baldivis Tramway Reserve) functioning as a greenbelt recreational spine. Baldivis Road contains a dual carriage way and has a varying speed limit of up to 80km per hour.

In 1995, Safety Bay Road was extended to link Baldivis Road with Mandurah Road. Up until 2009, it has been an important link for Warnbro/Port Kennedy Mandurah to access Kwinana Freeway. Safety Bay Road is reserved as an 'Other Regional Road' and currently consists of a dual carriage way with two way traffic movement and a speed limit of 80km per hour.

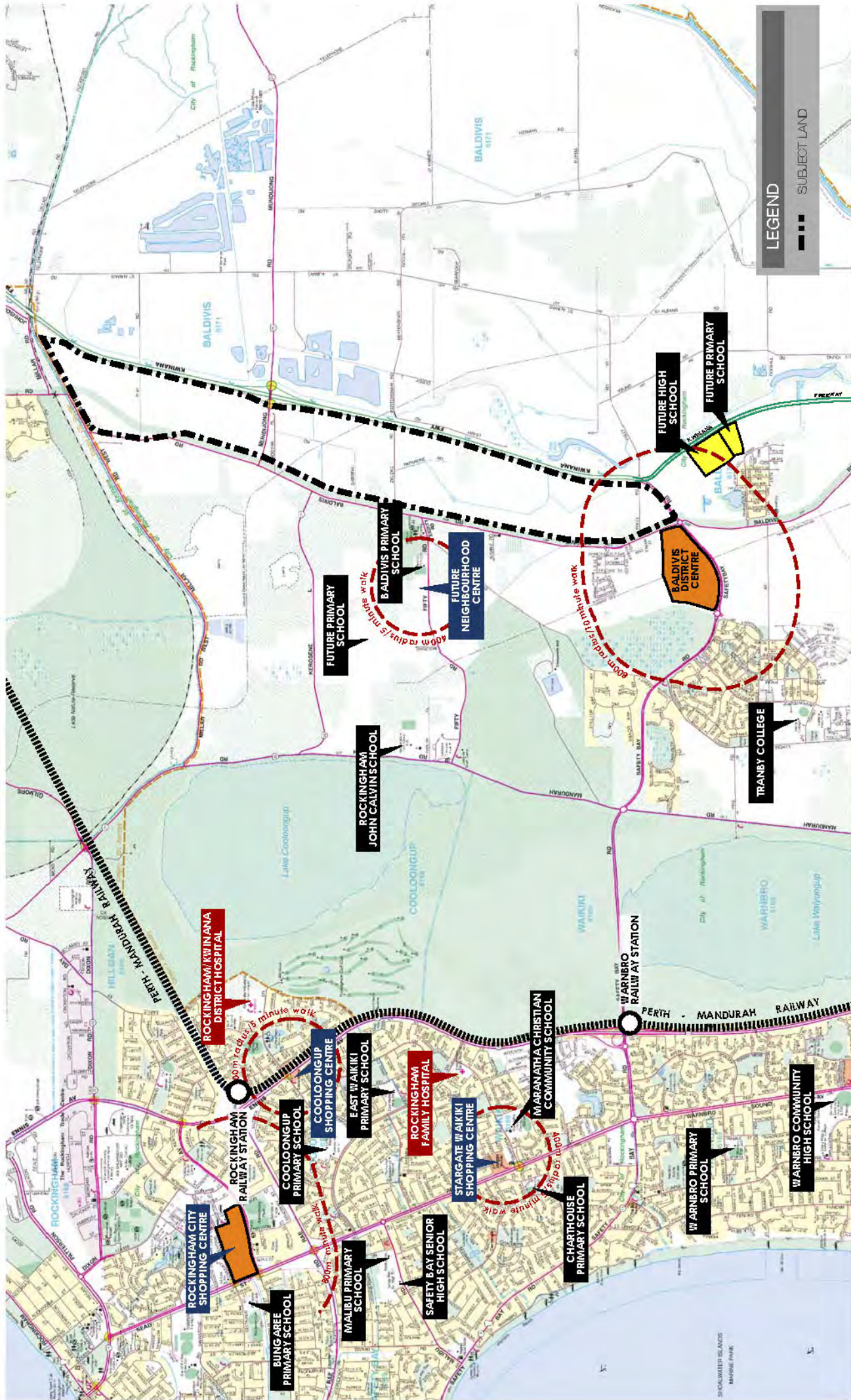
4.3 Regional Roads – Proposed

Planning for the regional road network within the vicinity of the EBDSP area is in place. Approximately 800m east of Baldivis Road is the Kwinana Freeway. The freeway extension commenced construction in December 2006 and was opened to traffic mid-2009.

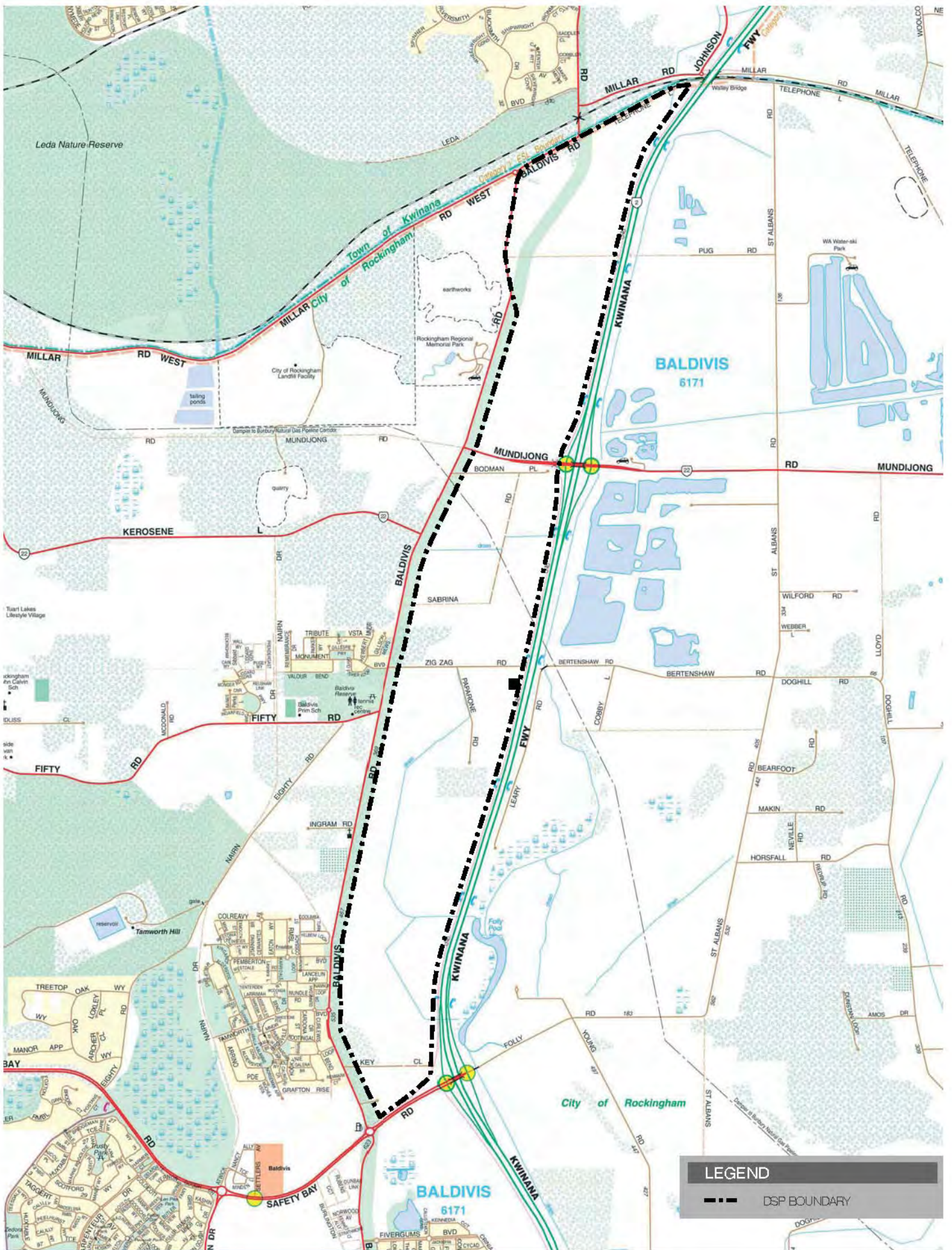
The Kwinana Freeway extension will have a significant impact on the Structure Plan area, removing almost all current regional based traffic from Baldivis Road and reducing traffic volumes along the adjoining section of Mandurah Road.

The Structure Plan area will also benefit having close access to the freeway. Access from the study area will be provided by the extension of Mundijong Road west of Baldivis Road, located central-north in the study area, and Safety Bay Road to the south of the study area. These roads will provide strategic links directly onto the freeway.

Nairn Road, approximately 1km to the west and running parallel to Baldivis Road, will ultimately be the primary north-south 'Integrator' road through the Baldivis District. Once completed, this road will reduce the importance of Baldivis Road in the context of district road hierarchy.



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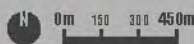
LEGEND

--- DSP BOUNDARY

LOCAL CONTEXT PLAN

East Baldvis District Structure Plan

A Joint Venture Project



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 d: Aug 2012
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4.4 Education

4.4.1 *Primary Schools*

Liveable Neighbourhoods requires the provision of one Primary School site for every 1,500 housing units. Approximately 4,581 lots (or equivalent dwellings) are proposed within the EBDSP, thus the site requires three Primary Schools under Liveable Neighbourhoods policy provision.

Preliminary advice from the DoE stated that should lot yields generate the need for three Primary Schools then measures should be taken to set aside land for this purpose. Subsequently, three Primary School sites have been provided evenly positioned within the northern, central and southern sections of the EBDSP. All school sites will be co-located with public open space.

4.4.2 *High Schools*

The Department of Education's (DoE) 1998 review of the Baldivis (South) District Structure Plan (encompassing the area south of Safety Bay Road), also took into consideration an assumed lot yield for the land area north of Safety Bay Road (i.e. the land now encompassed by the Baldivis North Structure Plan).

The DoE acknowledged the lot yield of 8,356 proposed under the Baldivis (South) Structure Plan, and assumed a lot yield of 3,730 for the area north of Safety Bay Road. The combined yield determined the need for 1.5 High Schools, based on DoE's *School Site Criteria Policy*, which stipulated one High School be provided for every 9,000 residential lots. The DoE resolved that two High Schools should be provided to cater for the long term development of the Baldivis area.

The DoE accepted that the identified location of a High School site, immediately south of Safety Bay Road, provided a suitable 'central' location to serve the populations north and south of Safety Bay Road. The suitability of this site was however tentative given uncertainty with regard to the drainage capability of the land to accommodate such development. A more appropriate location was later agreed and is now marginally south of the original location.

The current *Liveable Neighbourhoods* document recommends a more rigid catchment of one High School be provided for every four to five Primary Schools (6,500 – 7,000 lots). As there are ten Primary Schools planned for the broader Baldivis area, this policy supports the provision of two High Schools. As noted above, two High Schools have been planned for within the *South Baldivis District Structure Plan* area; the first within the Rivergums LSP (south of Safety Bay Road), and the second school on Sixty Eight Road, towards the southern end of the structure plan area.

Subsequent to this initial planning, the DoE has since confirmed that it seeks provision of a centrally located High School site within the EBDSP area, thus adequately (directly) servicing the student population of the five Primary Schools within the North Baldivis and East Baldivis District Structure Plan areas. BEST has agreed in principle to the DoE request and now proposes a High School site centrally located in the vicinity of Zig Zag Road.

The DSP Map shows a school site/open space precinct ('School Precinct') intended to include the High School, central Primary School and co-located POS. The affected landowners in this central area have been unable to reach an agreement on the precise location of the High School and co-located open space. As agreed with the City, both landowners have prepared alternative options, which are included along with a brief design rationale in **Appendix 8**. The City and Department of Education are requested to review the two options, and determine the preferred option which best satisfies the City and DoE objectives as part of the consideration of the DSP.

Further explanation of the planning for this precinct is provided in section 6.7.

4.5 Retail

Regional level shopping is provided by the Rockingham Strategic Regional Centre located approximately 8kms to the west of the EBDSP area. The first stages of development of a District Activity Centre (Baldivis Town Centre) have been completed, and once fully constructed, will have a retail floor space allocation of 25,000m² net leasable area as recognised by Council's Retail Strategy. Six local or neighbourhood level shopping centres are also planned within the North Baldivis Structure Plan immediately west of the site.

Given the nearby proximity of the Baldivis Town Centre, the provision of further retail floor space to cater for the local catchment within the Structure Plan area is unlikely to be viable in the short to medium term. This issue is further discussed in later sections of this report.

4.6 Surrounding Rural/Residential Land

The area to the north west of the EBDSP area is identified under Council's *Rural Land Strategy* as proposed for light industrial/service commercial. This area is contained within Kerosene Lane, Baldivis Road, the future extension of Mundijong Road and Parks and Recreation Reserve land to the west.

The *Baldivis North District Structure Plan Area* is located immediately west of the subject land and consists of predominantly R20 residential development with pockets of medium density development, mixed use development and six local/neighbourhood centres initially planned.

The area located east of the site is zoned 'Rural' under the City of Rockingham Town Planning Scheme. The City's *Rural Land Strategy* seeks to ensure the preservation of raw material resources in the area. It allows for subdivision to be considered to a minimum lot size of 8ha, only where it can be demonstrated that the land does not contain any raw materials worthy of protection and the Western Australian Planning Commission resolves to exclude land from the Basic Raw Material Policy Area.

The area south of the Structure Plan Area has recently been rezoned to allow for the existing residential development (Rivergums, Tuart Ridge and Heritage Park Estates) to extend to Safety Bay Road to the north and the Kwinana Freeway Reservation to the east.

A composite district structure plan which illustrates the project area in the context of the *North and South Baldivis District Structure Plan* areas is provided in **Figure 7**.

4.7 Opportunities and Constraints

The following section provides an overview of the opportunities and constraints affecting the project area.

4.7.1 Landform

The land is low lying and prone to seasonal inundation, thus a significant amount of infill will be required within the site.

4.7.2 Wetlands/Water Management

A large portion of the site is identified as a "Multiple Use" wetland on the Department of Environment and Conservation's (DEC) Geomorphic Wetlands Swan Coastal Plain dataset, hence the Statement of Planning Policy No. 2.1 *Peel-Harvey Coastal Plain Catchment* shall apply. To the far north of the site and in the central portion of the site (Lot 462) Baldivis Road) are a number of wetlands identified as "Resource Enhancement" on the DEC's dataset. These Resource Enhancement wetlands are to be retained within areas of public open space with appropriate buffers being provided subject to future review at the local structure planning phase.

The subject land is also located within the Peel-Harvey catchment and the provisions of the Environmental Protection (Peel Inlet – Harvey Estuary) Policy 1992 and SPP No. 2.1 will apply.

NORTH OF ZIG ZAG ROAD

There is opportunity to rehabilitate the Resource Enhancement Palusplain areas of the site by retaining them within POS. These areas can be incorporated into the drainage regime of the site by using them for the retention of surface runoff for regular storm events.

SOUTH OF ZIG ZAG ROAD

While there are no significant wetlands or water bodies on the site, an open drain traverses the southern portion of the site and generally affects the Peet Ltd, Australand Joint Venture and Lot 545 (private) landholdings. While this Water Corporation drain is a dedicated reserve across the Peet Ltd landholding, it is an unreserved drain across the Australand JV and Lots 545 landholdings; enroute to the Serpentine River via a culvert under the Kwinana Freeway. The Water Corporation has previously expressed that it has no intention to purchase the drain across the Australand JV and Lot 545 landholdings.

A central drainage corridor which incorporates a significant portion of the site's drainage function can act to minimise imported fill requirements, and presents opportunity for a central, landscaped corridor which provides amenity as well as performing critical drainage function.

Notwithstanding the above, the City's preference for the treatment of the current open drain to be treated through sub-surface drainage mechanisms in lieu of a living stream is acknowledged. The treatment (and final alignment) of the drain is therefore to be addressed at the Local Structure Planning phase by each respective landowner, this subject to detailed assessment under a Local Water Management Strategy.

4.7.3 Dampier to Bunbury Gas Pipeline

The Dampier to Bunbury Gas Pipeline and associated easement traverses east-west through the EBDSP area, and will require careful consideration as part of the future detailed subdivision design of the project area.

Any future Local Structure Plan covering the area affected by the pipeline corridor will take into account the provisions of the WAPC's Planning Bulletin 87 *High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region*, including setback distances from the pipeline corridor, and mitigation measures to manage risks.

It is envisaged that development may be considered within the designated setback areas subject to a risk management plan being prepared at the local structure plan phase demonstrating that the pipeline is within acceptable risk levels. Additionally, it is envisaged that roads may cross the pipeline providing they are as close as practicable to perpendicular to the pipeline corridor.

The DSP map under **Appendix 8** includes a notation that recognises the need to undertake further investigation into the width and nature of the Pipeline buffers at the LSP stage.

4.7.4 Kwinana Freeway and Mundijong Road

The location of the site abutting the Kwinana Freeway has implications on noise sensitive land uses such as the proposed abutting residential development within the EBDSP area. Noise considerations will need to be addressed through compliance with the WAPC's *Statement of Planning Policy 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning* (SPP 5.4).

The results of the acoustic assessment undertaken by Herring Storer Acoustic Consultants as provided in **Appendix 5** indicate that noise projections at residences located adjacent to the Kwinana Freeway, Mundijong and Baldivis Road in the year 2025 will in some instances marginally exceed the "Noise Limits" as outlined SPP 5.4. The level of exceedance would be up to 5 dB (A) without any noise amelioration measures.

Given the minor level of exceedances that could be expected, the acoustic report identifies that compliance with the SPP 5.4 could be achieved through the implementation of various amelioration measures such as the use of an acoustic wall or earth bunding, and/or the implementation of quiet house design. The use of acoustic walls or earth bunds will ultimately be dependent on the final ground levels within the EBDSP area which are yet to be determined. The selection and

implementation of noise amelioration measures can be identified and implemented at the Local Structure Planning phase.

The City of Rockingham's concept engineering design for the upgrading of Mundijong Rd shows the intention to raise the existing levels of Mundijong Rd from a point ~200m east of its intersection with Baldivis Rd. The proposed finished levels at this intersection would be approximately 6m higher than existing levels.

It is noted that the lifting of Mundijong Rd could potentially exacerbate noise impacts on adjoining residential development. At this point in time, it will be difficult to determine what steps will need to be taken to manage the acoustic impacts of Mundijong Road on the adjoining landholdings given that the final levels of both Mundijong Road and the adjoining landholdings have yet to be determined. To this end, further consideration will need to be given as part of the final design of Mundijong Road, and at the Local Structure Planning stage to determine the appropriate action to minimise these noise impacts.

It is anticipated that the use of fencing and landscaping could be implemented in order to manage the aesthetics and acoustic impact of Mundijong Road.

4.7.5 Bushfire Hazard Areas

The Bushfire Hazard Assessment Report has been prepared by Bushfire Safety Consulting to accompany the District Structure Plan – **Appendix 7** refers. The assessment methodology of the bushfire hazard and reporting is consistent with the Planning for Bushfire Protection guidelines (WAPC et. al. 2010). Additional details that influence bushfire behaviour such as site slope (i.e. topography) and the local weather data are discussed. The area assessed also included a 100 metre zone surrounding the study site. This was included to provide an indication of the study sites immediate surroundings that could impact on any future Bushfire Attack Level (BAL) assessments on buildings were the land to be designated as bushfire prone by the City of Rockingham in the future.

The report found that the subject land is predominantly covered in grassland, occupying an estimated 90% of the total area. Grassland vegetation class is classified as low bushfire hazard level rating. The entire site has negligible slope and hence will not influence the behaviour of a bushfire.

Weather variables are a significant factor in determining bushfire behaviour, and the site does experience predominantly south-west winds in the summer months. Grass fires are also highly responsive to wind speeds and direction. Small, relatively isolated areas of forest and woodlands provide the extreme bushfire hazard rating areas. There are similarly small isolated areas of moderate bushfire hazard where open woodland and open scrub occurs. The 100 metre zone surrounding the site similarly contains relatively isolated areas of open forest and woodland (i.e. extreme risk areas). The exception to this is the northern boundary of the study site which is adjacent to a significant area of open forest / banksia woodland which has very high fuel loads.

As outlined in the Planning for Bushfire Protection guidelines, the Hazard Assessment Report is required to determine the need for a Bush Fire Management Plan. The necessity to manage the moderate and extreme bushfire rating areas is acknowledged at the District Structure Plan phase. How these are managed, including provision of suitable setbacks and residential interface to these risk areas will be detailed at the Local Structure Planning phase of development.

Mitigation responses as in accordance with the Bush Fire Protection Design Guidelines will need to address:

- Location and site characteristics;
- Movement Network, vehicle access, firebreaks;
- Proximity of the Baldivis Tramway Reserve to surrounding development;
- Water Supplies; and
- Sitting of development, building separation zones, hazard separation zones, hazard reduction, landscaping and dwelling construction standards.

4.7.6 Poultry farm west of Baldivis Road

A poultry farm is located on the western side of Baldivis Road at the southern end of the site. The buffer distance between poultry farms and sensitive land uses prescribed by the EPA is 300 –1000 m (Environmental Protection Authority, 2005). Odour assessments may be carried out in specific locations at the local structure planning phase to determine appropriate buffer distances if residential development is proposed within the buffer zone while this facility is still operating.

4.7.7 Freeway Service Centre

The Freeway Service Centre shall be designed to ensure that it does not adversely affect the amenity of the adjoining future residential area identified within the EBDSP area. In this regard, the following measures will need to be implemented as part of the final design of the Freeway Service Centre:

- minimisation of light overspill;
- noise attenuation barriers or other measures to mitigate noise;
- maintenance of setbacks to the adjoining residential areas in accordance with EPA Guidance Statement No. 3 – *Separation Distances between Industrial and Sensitive Land Uses* including the incorporation of buffers wholly within the boundaries of the development area; and
- appropriate interface treatment between the development and the adjoining residential land uses e.g. landscaping etc.

WAPC Policy DC 1.10 – *Location and Design of Freeway Service Centres* indicates that a Freeway Service Centre should be located within a locality that is not identified as a future residential area. However in this instance, provided that the preceding measures are implemented, the proposed Freeway Service Centre is not considered to adversely affect the amenity of the adjoining residential area in the long term.

The rezoning of the Freeway Service Centre (FSC) site was progressed to facilitate the development of a Freeway Service Centre and contain all noise associated buffers etc within the confines of the lot boundaries. It is for this reason that the site was configured so large, as the FSC itself is to only occupy a very small portion of this site

It is noted that the EPA Regulations 1997 recommend a buffer of 100m to residential development, whilst a buffer of 140m was recommended by Herring Storer at the time of the local Scheme Amendment (Amendment 15). It is not necessary for this buffer to extend beyond the boundary of the FSC lot, given the FSC land use is on a lot that is capable of fulfilling all associated buffer requirements within the boundaries of the lot on which it is contained.

In addition, given the restrictions placed on size and operation of the facility through provisions of the Scheme, and prohibiting bulk fuel services on the site, the FSC should be able to be contained on site including fully containing the associated buffer as intended when the FSC was approved. Therefore no portion of the proposed residential development should be impacted upon by this buffer.

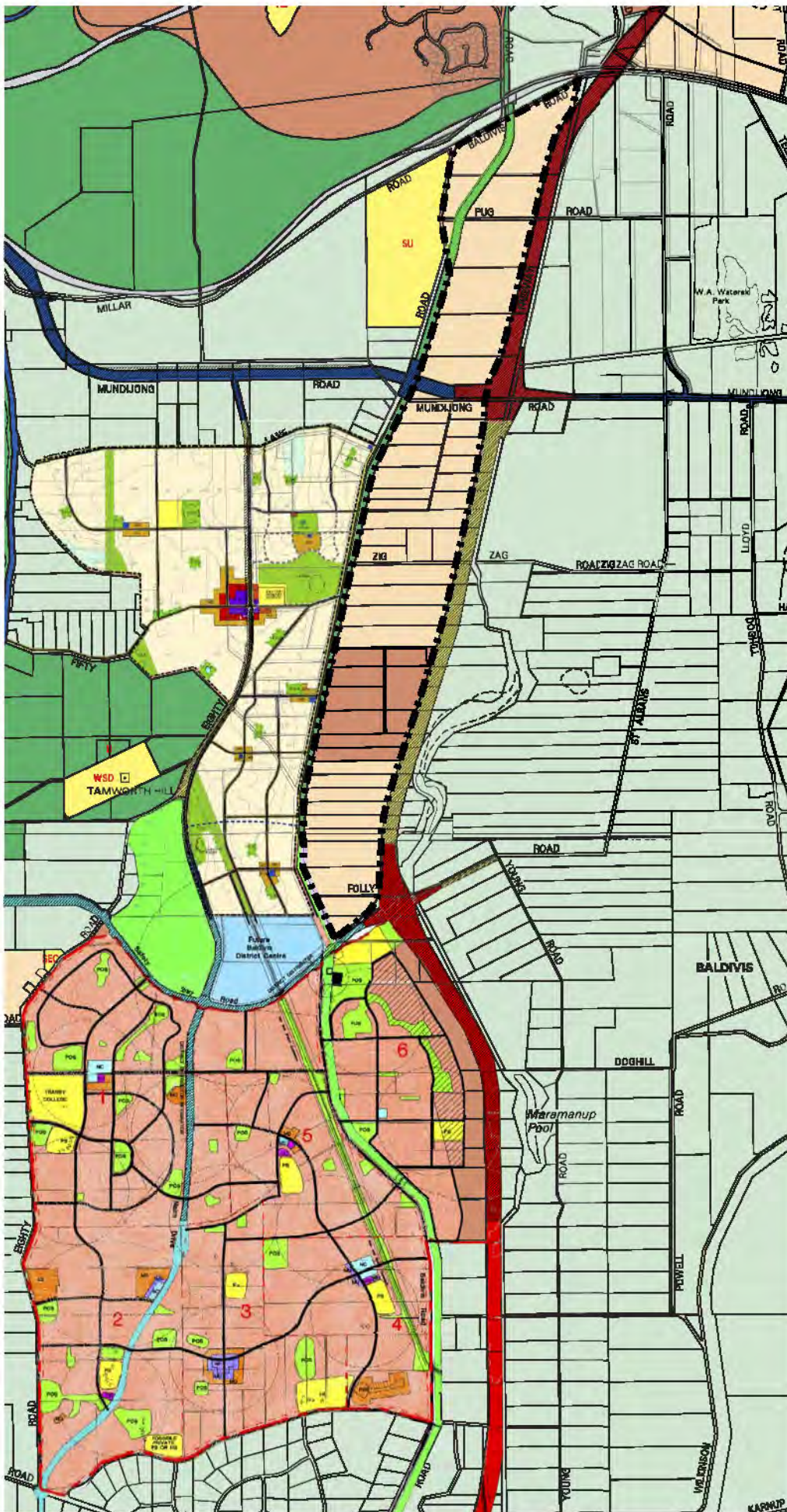
4.7.8 Bonney's Water Ski Park

Bonney's Water Ski Park is located approximately 1.5 km east of the EBDSP; its closest point being the landholding north of Mundijong Road. The City of Rockingham undertook noise readings on 29th January 2011, during a Jet Sprint Club Meet at Bonney's Water Ski Park. The noise readings were done in conjunction with the Town of Kwinana, and focused on three areas of proposed development – Wellard East, Wellard West and East Baldivis. Noise readings were undertaken at a variety of locations in these three areas, as well as at Pug Road (between Bonney's and the Freeway).

The emitted noise levels from the Jet Sprint Meet varied depending on the location and the type of boat. There were some exceedances noted during the noise readings. The noise readings obtained in East Baldivis were taken along Baldivis Road north of Mundijong Road. The noise levels recorded

were borderline on the allowable noise levels, however the noise appeared to be as a result of the Freeway and not the Jet Sprint Meet. At the time of the measurements, the noise from the Jet Sprint Meet was not distinguishable over the Freeway noise.

In light of the observations made on site during the event, and the fact that East Baldivis will need to have acoustic design controls placed on the development in accordance with WAPC Policy 5.4 (due to its proximity to the Freeway), it was concluded by the City that the noise buffer zone previously delineated over the area north of Mundijong Road could be lifted, and the restrictions to sensitive noise land uses no longer need to apply.



LEGEND
CITY OF ROCKINGHAM
TOWN PLANNING SCHEME NO.2

- RESERVED LANDS**
- PARKS AND RECREATION**
 - RAILWAYS**
- ROADS**
- PRIMARY REGIONAL ROADS**
 - OTHER REGIONAL ROADS**
 - PUBLIC PURPOSES -**
 - SU** **SPECIAL USES**
- ZONES**
- URBAN**
 - URBAN DEFERRED**
 - RURAL**

- BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**
- NEIGHBOURHOOD CENTRE - RETAIL CORE**
 - NEIGHBOURHOOD CENTRE - MIXED USE**
 - COMMUNITY FACILITIES**
 - MEDIUM DENSITY HOUSING**
 - WALKABLE CATCHMENT NODE**
 Potentially includes a retail (corner store) max. 150m diam, medical centre, day care centre, community facility etc.

- BALDIVIS (SOUTH) DISTRICT STRUCTURE PLAN**
- STRUCTURE PLAN BOUNDARY**
 - PRIMARY DISTRIBUTOR ROAD**
 - DISTRICT DISTRIBUTOR ROADS A&B**
 - NEIGHBOURHOOD CONNECTOR ROADS**
 - REGIONAL OPEN SPACE**
 - PUBLIC OPEN SPACE & DRAINAGE**
 - RURAL**
 - LOCAL CENTRES (LC)**
 - URBAN**
 - POTENTIAL URBAN LAND**
 - SCHOOLS**
 - NEIGHBOURHOOD CATCHMENTS**
 - WALKABLE CATCHMENTS**
 - PUBLIC PURPOSES**
 - NC** Neighbourhood Centre
 - LD** Low Density
 - MD** Medium Density
 - MU** Mixed Use
 - CU** Community Use
 *Home Store's not included, refer to Retail Strategy
 - DSP BOUNDARY**

COMPOSITE DISTRICT STRUCTURE PLAN
 East Baldvis District Structure Plan
 A Joint Venture Project

0m 250 500 750m
 s: NTS
 d: Aug 2012
 j: 06/082

5.0 SERVICING INFRASTRUCTURE

5.1 Stormwater Management

A hydrological report which summarises the urban water management issues affecting the project area is provided in **Appendix 4**. The following section provides a summary of this report.

Structure planning and subdivision design will be carried out to ensure that the principles of the Better Urban Water Management framework (WAPC, 2008) are met by the development. This includes adhering to strict engineering and environmental design objectives, including the following key items:

- Provision of water quality treatment measures to achieve nutrient reduction targets in both surface water and groundwater;
- Integrating water management function within POS areas in accordance with water sensitive urban design principles;
- Controlling runoff from the site to ensure downstream environments are not impacted by development and peak flow rates are maintained at pre-development levels;
- Protecting nearby wetlands and waterways to ensure water quality is maintained or improved, and hydrologic regime is not altered; and
- Minimising potable water consumption to within State Water Plan targets.

NORTH OF ZIG ZAG ROAD

Although generally flat, the site has several minor open drains which convey surface runoff to the Peel Main Drain, on the eastern side of the Kwinana Freeway. The conceptual drainage design for the proposed development retains the series of existing culverts which connect the site to the Peel Main Drain.

The site will be divided into eleven subcatchments, which will each provide flood attenuation in the form of storage basins within each subcatchment before discharging to the Peel Main Drain. The peak allowable flow rates for each subcatchment have been proposed based on a per-hectare runoff rate of 4.5 L/s/ha. The allowable flow rates for each catchment, as specified in the North-East Baldivis DWMS (PB, 2009), are summarised in the table below.

Preliminary estimates of required storage areas and volumes have been provided in the North-East Baldivis DWMS. These storage basins will be designed to ensure that all runoff from minor storm events (up to 1year 1hour ARI) will be retained on-site, and that peak flow rates from each subcatchment for major storm events (up to 100year ARI) are within allowable rates. The estimated storage volumes required are summarised in the table below.

Table 5.1A – North Storage Volumes

Subcatchment	Peak allowable flow (100yr ARI)	Peak storage volume (100yr ARI)
1	0.14 m ³ /s	8,250 m ³
2	0.19 m ³ /s	12,520 m ³
3	0.09 m ³ /s	12,640 m ³
4	0.14 m ³ /s	15,500 m ³
5	0.14m ³ /s	11,750 m ³
6	0.16 m ³ /s	12,420 m ³
7	0.14 m ³ /s	14,650 m ³
8	0.30m ³ /s	23,360 m ³
9	0.11 m ³ /s	9,620 m ³
10	0.14 m ³ /s	17,060 m ³
11	0.10 m ³ /s	12,750 m ³

SOUTH OF ZIG ZAG ROAD

The site is predominantly flat, with two significant open drains crossing the site on an approximate north-south alignment conveying runoff from the site to the Peel Main Drain, on the eastern side of the Kwinana Freeway.

The conceptual drainage design for the site proposed to retain a single drainage outlet to the Peel Main Drain, and reconfiguring the existing open drains through the site into a central multiple use corridor with offline storage basins to provide water quality treatment and flood attenuation measures.

The East Baldivis DWMS (PB, 2007) proposes to retain the existing 'Sub H Branch Drain' as the major drainage outlet for the site. The existing open drain will be retained within a central POS corridor, and flow from the site will be discharged to the Peel Main Drain via the existing 1050mm diameter culvert. The existing open drain through the southern portion of the site will be redesigned to connect with the Sub H Branch Drain to the north. Offline storage areas will be provided to provide flood attenuation within each landholding, and to ensure that peak flow rates from each landholding are restricted to pre-development rates. The modelled post-development peak flow rate from the offline storage basin in each landholding is summarised in the table below.

Preliminary estimates of required offline storage areas and volumes for each landholding have been provided in the East Baldivis DWMS. Pre-development modelling was carried out to estimate peak flow rates, based on existing site conditions, and post-development drainage design will ensure that runoff from minor events (up to 1year 1hour ARI) is completely retained on-site, and flow rates are attenuated to pre-development levels for major storm events (up to 100year ARI). The estimated storage volumes required for each landholding are summarised in the table below.

Table 5.1B – South Storage Volumes

Landholding	Peak allowable flow (100yr ARI)	Peak storage volume (100yr ARI)
Peet Limited	0.7 m ³ /s	10,800 m ³
Australand Joint Venture	0.9 m ³ /s	12,800 m ³
Private landowners	0.7 m ³ /s	6,900 m ³
Perron Group (on market)	0.5 m ³ /s	6,900 m ³

5.2 Sewerage

Wastewater flows from the subject land are intended to be conveyed to the future East Rockingham Wastewater Treatment Plant (ERWWTP), when the plant is commissioned in 2015, as projected by the Water Corporation. In the interim period prior to commissioning of the ERWWTP, wastewater may potentially be conveyed to the Kwinana WWTP.

Numerous discussions have been held with the Water Corporation in relation to the provision of a reticulated sewerage service. The Water Corporation's planning has wastewater flows from the project area being conveyed to the future ERWWTP. In the interim, the Water Corporation has advised that there is limited capacity at the existing Kwinana WWTP. The Civil Group, on behalf of the BEST, is working with Water Corporation towards the detailed design and estimated costing of the sewerage infrastructure required to convey wastewater from the project area to the Kwinana WWTP on a temporary basis.

Discussion regarding the wastewater outflow methodology is provided in the Servicing Report prepared by The Civil Group; **Appendix 2** refers.

5.3 Water Supply

The EBDSP area falls within the existing Tamworth-Karnup System boundary. The infrastructure to support full development of this area is identified in the ultimate system planning, which envisages the extension of a large diameter pipeline from the Tamworth Reservoir, and along Eighty Road, Baldivis to extend to the project area. This is detailed by The Civil Group in the appended servicing report.

5.4 Power Supply

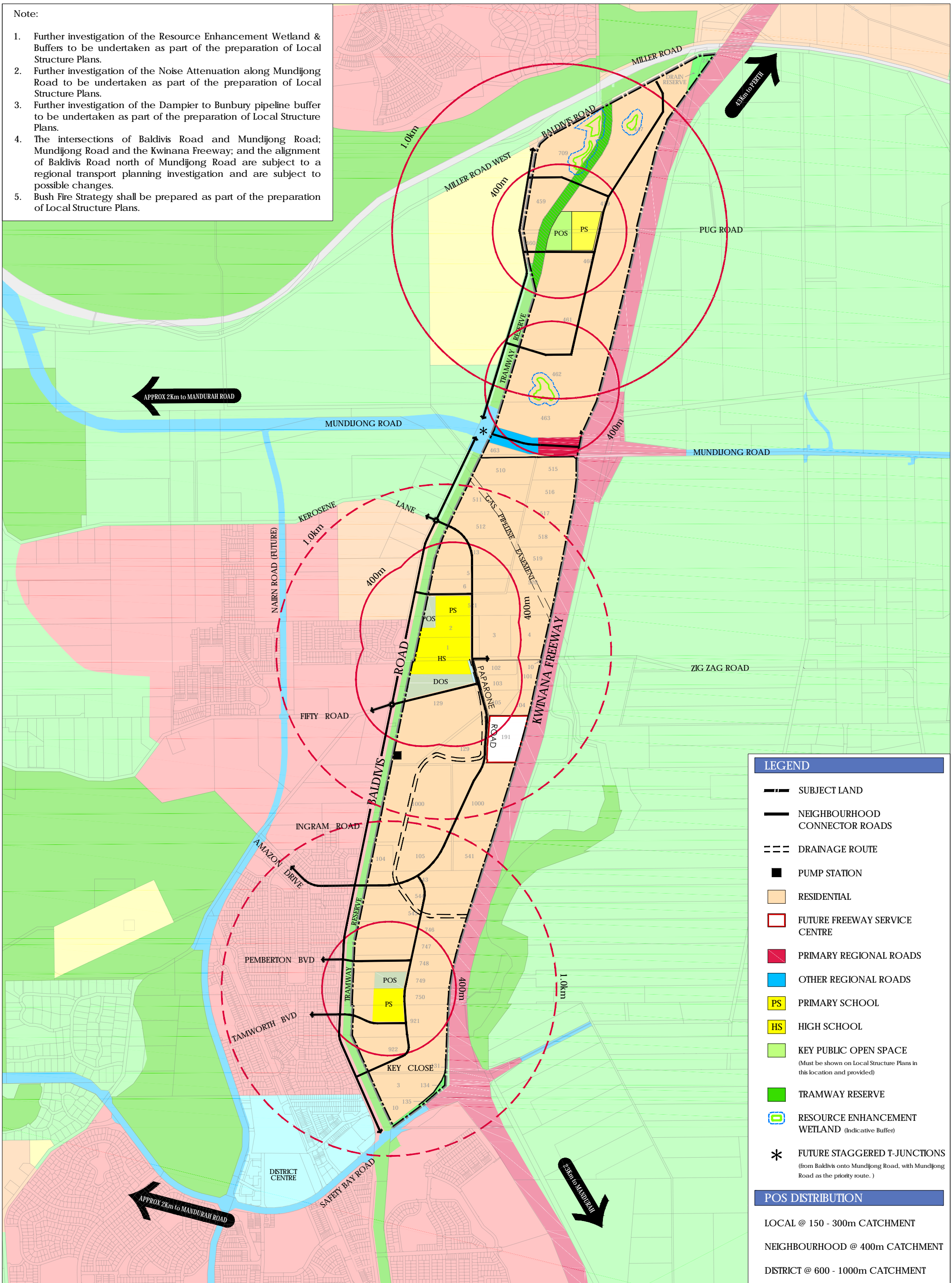
Enquires with Western Power have established that there are no constraints to the provision of electricity supplies to and within the EBDSP area.

5.5 Gas Supply

Gas reticulation infrastructure is in close proximity to the project area, and can be readily extended to service the subject land as described within the servicing report.

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. The intersections of Baldvis Road and Mundijong Road; Mundijong Road and the Kwinana Freeway; and the alignment of Baldvis Road north of Mundijong Road are subject to a regional transport planning investigation and are subject to possible changes.
5. Bush Fire Strategy shall be prepared as part of the preparation of Local Structure Plans.



LEGEND

- SUBJECT LAND
- NEIGHBOURHOOD CONNECTOR ROADS
- DRAINAGE ROUTE
- PUMP STATION
- RESIDENTIAL
- FUTURE FREEWAY SERVICE CENTRE
- PRIMARY REGIONAL ROADS
- OTHER REGIONAL ROADS
- PS PRIMARY SCHOOL
- HS HIGH SCHOOL
- 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 onto Mundijong Road, with Mundijong Road as the priority route.)

POS DISTRIBUTION

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



6.0 STRUCTURE PLAN

The proposed District Structure Plan layout is provided in **Figure 8**.

6.1 Gross Subdivisible Area and Lot Yield Projections

The majority of the study area will be assigned a 'Low Density' Residential Coding with pockets of 'Medium Density' encouraged abutting areas of Public Open Space, public transportation routes and other preferred higher density areas pursuant to *Liveable Neighbourhoods* design principles. There is also the potential for a comprehensive 'Medium Density' area in the southern portion of the study area, in response to its proximity to the Baldivis District Town Centre.

The Gross Subdivisible Area and residential lot/dwelling yields for the study area have been projected based on community and service infrastructure, drainage and public open space considerations as detailed below:

Table 6.1A – Developable Area

Total Site Area		376.5 Ha
Deductions		
Non Residential Land Uses	3 x Primary School Sites	~ 12.00 Ha
	1 x High School Site (excluding proposed road closures)	~ 9.50 Ha
	Freeway Service Stop (Lot 9000)	~ 5.99 Ha
Green Areas Not Creditable for Open Space	Resource Enhancement Wetland – Core Resource Enhancement Wetland – Buffer Non Credited Gas Pipeline Corridor (100%) Non Credited Drainage Area* (*Area in excess of the 20% restricted open space provisions in accordance with WAPC Liveable Neighbourhoods Policy)	~20.96 Ha
~ Total Deductions:		~ 48.45 Ha
Gross Subdivisible Area:		328.05 Ha
Public Open Space Required:	10% of Gross Subdivisible Area POS may consist of ... -> Credited Drainage Area -> Credited Gas Pipeline Corridor (50%) -> Balance of POS to be Provided	32.80 Ha

The indicative Gross Subdivisible Area and projected lot/dwelling yields are based on several assumptions, and are to be used as a guide only. Lot/dwelling yields are subject to detailed Local Structure Plan and subdivision design, and confirmation of various outstanding matters including necessary drainage provision, environmental issues, engineering and earthworks requirements etc for respective developments.

It is acknowledged that the subject site is low lying, and an innovative drainage solution is required. This may partly be in the form of drainage corridors, and will impact on the amount of space allocated for drainage purposes. Drainage projections prepared by The Civil Group anticipate that up to approximately 6% of the site may be required to accommodate urban water storage.

In terms of the road network, the percentage of land required for roads (~32%) will be influenced by various constraints across the site and the need to minimise crossings of these constrained areas (e.g. the gas pipeline easement, resource enhancement wetlands, Water Corporation main drain and Baldivis Tramway). The area allocated for road reserve will differ for each respective developer and will be determined at the Local Structure Planning and subdivision phases.

Table 6.1B – Projected Lot Yields

EAST BALDIVIS	DSP Projected Lot Yields (Feasibility Studies)
North of Mundijong Road	
BGC – Lots 447, 459 & 709	630
Cedar Woods – Lots 460 - 463	876
<i>North SubTotal</i>	1,506
South of Mundijong Road	
Perron Group – Lots 510 - 521, 1 – 6	810
* Lots 10, 101 – 105 ('Special Rural' Lots)	155
PEET (Zig Zag Rd) - Lot 129	300
Australand JV – Lots 1000, 104, 105, 541, 543, 544	850
* Lots 545, 746 – 750	545
Perron Group – Lots 921, 922, 3	380
* Lot 10	35
<i>South SubTotal</i>	3,075
<i>* Indicates Private Ownership (not in BEST) – yield based on 410m² lot average.</i>	4,581

Figures advised by DPS, RPS, TBB, CLE and Greg Rowe & Assoc Planning Consultants based on client feasibilities.

6.2 Residential Densities

The EBDSP is proposed to have an encompassing Residential R25 density coding. Pockets of 'Medium Density' (R30 to R60) are encouraged abutting areas of Public Open Space, public transportation routes and other preferred higher density areas pursuant to Liveable Neighbourhoods design principles. There is also the potential for a comprehensive 'Medium Density' precinct in the southern portion of the study area, in response to its proximity to the Baldivis District Town Centre. An average lot size of 410m² has been determined by BEST, with this considered a realistic figure based on current market demand in this outer Metropolitan area. While a base R25 density coding across the DSP area has been earmarked, a 350m² lot average is a *minimum* requirement for R25, with no maximum requirement currently prescribed by the RCodes. This suggested average lot size is also supported by the DSP's general fulfilment of State prescribed density targets as noted below.

It is acknowledged that housing affordability and market demand at the time of development will also influence the number of lots ultimately constructed.

6.3 Comparison with Directions 2031 Objectives

The *Directions 2031* and the accompanying *Outer Metropolitan Perth and Peel, Sub-Regional Strategy* (OMSRS) has set a target rate of 15 dwellings per **gross urban zoned** hectare. Notwithstanding this, the draft urban expansion plan assumes a 'business as usual' approach to development and has estimated the amount of land required to provide a 10 year buffer based on 10 dwelling units per gross urban zoned hectare.

The dwelling projections identified in *Directions 2031* are based on the WAPC's '**gross urban zone**' definition. By definition, gross urban zone is to encompass all 'urban' zoned land (i.e. residential cells, Public Open Space, roads, Primary Schools, Neighbourhood Centres etc; and exclusive of Parks and Recreation Reserves, Regional Roads and Railway Reserves, High School Reservations, District Activity Centres and greater, etc).

The *Directions 2031* density targets for East Baldivis should therefore be based on the following gross land area:

Table 6.3 – Directions 2031, Developable Area

Total Site Area		376.5 Ha
Non Urban Land Use Deductions	1 x High School Site (excluding proposed road closures)	~ 9.5 Ha
	Freeway Service Stop (Lot 9000)	~ 5.99 Ha
Total Deductions:		~ 15.49 Ha
Gross Urban Zone Area:		361.01 Ha

Directions 2031 and associated documents forecasted a lot yield of 3,200 for the area south of Mundijong Road (Ref: Baldivis North BA4). No projections were provided to the north of Mundijong Road having previously been earmarked for Industrial development.

According to BEST projections, the area south of Mundijong Road will accommodate approximately 3,075 lots. The BEST projection is considered conservative, however a more accurate figure than *Directions 2031* taking into account the various physical constraints identified below, as well as community infrastructure (e.g. recently earmarked High School site and third primary school), and other physical constraints including a high pressure gas pipeline easement.

The projected lot yields provided by the respective developers (June 2012) and basic feasibilities for the existing Special Rural site and non-participating landowners suggests in the order of 4,600 lots being provided across the total East Baldivis DSP cell. It is generally intended that lots created would not be designed to be further subdivided, therefore dwelling yields would be comparative to this figure (albeit acknowledging that some Grouped Dwelling sites are likely and will increase this notional figure).

Based on the *Directions 2031* definition, the Gross Urban Zoned Density for the DSP equates to **12.70 dwellings** per hectare.

Whilst *Directions 2031* objectives seek 15 dwellings per hectare, the **12.74 dwellings** per hectare projection is considered feasible given that:

- the current dwelling yield is conservative and based on current market demand/trends. Higher dwelling yields will be reviewed at the time of development by each respective landholder;
- expected higher (than average) percentage of stormwater drainage on this low lying area; and
- physical constraints, namely the high pressure gas pipeline and easement – which consumes a large area otherwise developed for residential dwellings.

The proposed forecast across the DSP area is subject to the final design for each respective LSP and subdivision stages allowing for detailed drainage and environmental constraints for each respective landholding, including landowner preference for retention of remnant native vegetation, wetland retention etc. Preferred lot mix and market demand at the time of land release will also influence final dwelling yields.

6.4 Retail Network

Regional level shopping is provided by the Rockingham Strategic Regional Centre located approximately 8kms to the west of the Structure Plan area.

The first stages of development of the Baldivis District Town Centre have been completed, and once fully constructed, will have a retail floorspace allocation of ~25,000m² net leasable area, as recognised by Council's *Retail Structure Plan*. This District Town Centre is ~100m at its closest point to the EBDSP, and with the core retail area fronting Safety Bay Road ~800m away.

Six local or neighbourhood level shopping centres are also planned within the North Baldivis Structure Plan immediately west of the EBDSP area.

A Commercial Activity Plan report which has been prepared by Taktics 4 identifies the potential for, and the merits of developing an additional smaller supermarket based centre on either side of the Mundijong and Baldivis Road intersection to service the community planned in and around the northern part of the EBDSP area. A copy of this report is provided in **Appendix 6**.

RPS Economics has undertaken a high level review of the Taktics 4 commercial activity plan report undertaken for the EBDSP area.

Accessibility constraints and analysis outlined in the report are valid and heavily influence the role and function of any retail offering in East Baldivis.

The report has adopted uniform circular catchments in assessing existing and potential centre customer draw/coverage.

While this approach is valid for preliminary high level assessments and in areas with established population and transport networks, it is questionable whether such circular catchments are truly reflective of the travel patterns of customers in greenfield residential areas. An infrastructure and accessibility-based approach would be preferred, resulting in non-circular customised catchments for each centre.

The catchment analysis contained in the report has raised concerns regarding the coverage levels of the area north of the Mundijong Road in East Baldivis.

The alignment of the Kwinana Freeway and Baldivis Road, and the western constraint of the Rockingham Lakes Regional Park mean that, rather than adopting a circular catchment, the Baldivis District Centre and the Fifty Road Centre are likely to exhibit elongated north-south oriented catchments.

Such catchments would extend the influence of the Baldivis District Centre north, extending beyond Mundijong Road and into the northern part of East Baldivis. This in turn will force the Fifty Road catchment north as well as encompassing most of the same area. This is particularly the case if the Baldivis District Centre is successful in securing two Discount Department Stores (DDS).

The proximity of the area north of Mundijong Road to the Kwinana Town Centre and Wellard Neighbourhood Centre also raises questions regarding the extent to which the north part of East Baldivis would be serviced by non-circular catchments for these centres.

Factoring in these catchment differences, it is questionable whether a convenience retail centre north of Mundijong Road will be required in the development.

If required, the centre would likely be very small (~500sq.m) including convenience retail offerings such as a small convenience grocer, baker, newsagent and takeaway food outlet.

The commercial viability of such a size centre is questionable. Its location on Mundijong Road, providing it with access to some albeit minor passing traffic trade, is critical. Alternatively, co-location with school offerings in the area would provide an opportunity for trip linking travel patterns to be exploited.

Alternatively, such a centre could be offered as part of an off-highway petrol station/convenience retail (i.e. Freeway Service Centre) development, further enhancing the centre's viability.

Additionally, it is unlikely that such a centre would be required until well after residential build-out as small retail centres are generally successful in areas with established and increasingly gentrified (3rd and 4th home owners with mature families) populations, providing a more intensive primary expenditure pool.

6.5 Mixed Use Development

Having regard to the comments provided in section 6.4, a mixed use development within the EBDSP is also unlikely to be viable. It would be incumbent upon the proponent at the Local Structure Planning stage to further investigate and identify the viability of mixed use development in the EBDSP area if such a land use is desired, including further consideration of any traffic impacts.

6.6 Employment

In recognition of the objectives of the Directions 2031 policy, which assumes a more balanced distribution of housing, population and employment across the metropolitan area, the Tactics 4 report investigates the opportunities for employment self-sufficiency within the project area. The findings of the report highlight the context of the subject land in terms of access to other employment generating land within the surrounding district, and the positive benefits that the potential development of an additional smaller supermarket and/or mixed use development area would have in terms of employment.

The Tactics 4 report takes a long term view of the economic viability of, and planning justifications for the development of small scale retail, mixed use and/or other employment generating land uses. It is open for future proponents of a Local Structure Plan within the EBDSP area to utilise the findings of the report to make provision for such uses. Notwithstanding, the viability of such a land use in the short to medium term is unlikely to be economically viable.

6.7 Educational Facilities

The Liveable Neighbourhoods *Element 8 – Schools* establishes standards for the provision of school sites within urban areas based upon the following standards:

School Type	Government Schools	Private Schools
Primary Schools	1 Primary School for every 1500 housing units.	1 private Primary School for every 3 Government Primary Schools
Secondary Schools	1 High School for every 6500 – 7000 housing lots (or 4 - 5 Primary Schools)	1 private High School for every 2 government High Schools
TAFE	TAFE site per 60 – 70,000 persons up to 250,000	Nil

6.7.1 Primary Schools

Liveable Neighbourhoods requires the provision of one Primary School site for every 1,500 housing units. Approximately 4,600 lots (or equivalent dwellings) are proposed within the EBDSP, thus requiring three Primary Schools under Liveable Neighbourhoods policy provision.

Preliminary advice from the DoE stated that should lot yields generate the need for three Primary Schools then measures should be taken to set aside land for this purpose. Subsequently, it was resolved to provide three Primary School sites evenly positioned within the northern, central and southern sections of the EBDSP area. The central Primary School will be provided adjacent to the High School site. All school sites will be co-located with, or in close proximity to, public open space.

The preferred location of the Primary Schools sites is in response to:

- providing an equitable share of these sites across land holdings so as to maximise cost sharing and 'obligation' for public facilities as agreed by all BEST landowners.
- positioning the schools away from the gas pipeline easement traversing the centre of the EBDSP area;
- positioning adjacent or in proximity to the Tramway Reserve, therefore offering excellent pedestrian linkage to and from the sites in addition to the internal road and intended path network.
- providing sites that will be designed with at least three road frontages to assist with traffic accessibility and circulation.
- providing sites that are co-located with Public Open Space areas, therefore offering shared use of playing fields and passive recreational areas under joint management. The co-location will ensure maximum usage of these community facilities.

The positioning also takes into consideration the location of the two Primary Schools provided on the west side of Baldivis Road (one existing/one imminent), situated within the adjoining North Baldivis District Structure Plan area; and positioned central-west of the EBDSP.

Once the various Primary School sites have been developed, it is expected that the school catchments will be reviewed by the DoE to ensure residents from both North and East Baldivis are allocated the nearest school.

Primary School 'ped-sheds' have been provided in **Figure 8** to indicatively illustrate suggested walkable catchments for students.

6.7.2 High School

Initial structure planning proposed no High School site within the EBDSP, as the development area and projected lot yields did not constitute a full catchment for a High School (6,500 – 7,000 lots). The DoE's negotiated High School site situated approximately 300m south of Safety Bay Road, within the *Rivergums Estate LSP*, was originally to serve the North Baldivis, East Baldivis and the northern portion of the South Baldivis DSP areas.

Following further discussions between BEST, City of Rockingham and DoE, the DoE has since resolved to seek a High School site north of Safety Bay Road; to be centrally located in East Baldivis to directly serve the North and East Baldivis DSP school catchments (5 Primary Schools). To address this request, BEST now proposes to provide a High School site central to the DSP area, located in the vicinity of Zig Zag Road. The school will ultimately be designed with co-located public open space facilities, namely a 4ha District Open Space area, a separate Primary School immediately to the north and an area of remnant vegetation.

The site's position adjacent to Baldivis Road and the tramway reserve offers a pedestrian friendly environment on approach to the High School and adjacent facilities. The location of the High School will also be well serviced by the local and neighbourhood road network, providing a good level of private and public transport accessibility with three road frontages servicing the site. It is envisaged that the north-south *Neighbourhood Connector* on the school sites eastern boundary will be the primary road servicing the school but this will, ultimately, be subject to DoE design of the school administration buildings.

Furthermore the location of the High School site addresses the following key objectives:

- a centrally located 'school precinct' and co-located DOS has been provided over two landholdings either side of Zig Zag Road adjacent to the existing Baldivis Reserve, with intention to close a portion of Zig Zag Road to provide the best 'school precinct' design outcome;
- the 'school precinct' is provided with good transport connections and is surrounded by three *Neighbourhood Connectors*; Baldivis Road to the west, the north-south *Neighbourhood Connector* to the precinct's east and the extension of Fifty Road running east-west along the precinct's southern boundary;
- 4 hectares of District Open Space (DOS) has been located adjacent to the Baldivis Reserve adjoining the tramway reserve providing a larger consolidated active sporting reserve with a high level of accessibility;
- the High School site has been co-located with the DOS to provide for shared infrastructure provisions of the active playing fields;
- the High School site adjoins the tramway reserve as required by the City of Rockingham;
- a 4 hectare stand alone Primary School site has been proposed north of Zig Zag Road adjoining the High School site, as per the DoE's preference; and,
- approximately, 1.2 hectares of 'passive' public open space has also been provided between the tramway reserve and the Primary School site. This public open space has been provided to retain remnant vegetation and has been located adjacent to the tramway reserve to ensure a consolidated area of remnant bushland is retained opposed to segmented areas throughout the DSP.

The two design options (refer **Appendix 8**) represent the alternative proposals of the most affected landowners, given that a consensus position could not be reached. The options are therefore presented for Council's determination as to the most appropriate design to include in the adopted DSP.

6.8 Staging

It is noted that the Rockingham Urban Growth Program, that included the survey results of development intentions of landowners within the EBDSP area, has foreshadowed a large portion of the EBDSP area progressing residential development within the years 2012 to 2017.

Notwithstanding, the staging of subdivision and development within the EBDSP area will be dependent on a number of factors including:

- Servicing availability;
- Market conditions; and
- Landowner intentions.

The adoption of a District Structure Plan over the project area will ensure that future subdivision and development within the context of Local Structure Plans prepared and adopted within the EBDSP area can be undertaken in a well planned and orderly manner. In this regard, the EBDSP is considered to be sufficiently robust to accommodate a variety of staging options.

7.0 TRAFFIC AND TRANSPORT MANAGEMENT

The traffic and transport requirements for the EBDSP area have been reviewed by Uloth and Associates, and are comprehensively outlined in the Traffic and Transport Study which is provided in **Appendix 3**.

The *East Baldivis District Structure Plan - Traffic and Transport Requirements* report was initially prepared by Uloth and Associates in February 2010, before being revised to reflect the updated Structure Plan in May 2011 and later October 2012.

A key assumption in the preparation of that report was that the future intersection at Baldivis Road - Mundijong Road would be constructed as a 4-way intersection, controlled by either traffic signals or a roundabout. However, it has since been determined that Baldivis Road should be downgraded at Mundijong Road to a pair of staggered T-junctions, with Mundijong Road as the priority route.

The Traffic and Transport Study divides the structure plan area into three areas, being north of Mundijong Road, and the area south of Mundijong Road divided evenly into two parts.

On the basis of the projected lot yields outlined in the EBDSP, and the provision of three Primary Schools and a High School, it is estimated a total of 33,200 vehicle trips per day would be generated in the EBDSP area based upon a daily rate of 8 vehicle trips per dwelling.

It is expected that the internal trips made to the Primary Schools will approximately balance with the trips drawn to the High School from outside the EBDSP area. To this end, the Study estimates that 33,200 vehicle trips per day will be added to the external road network from the EBDSP area.

Mundijong Road is expected to carry the highest proportion of traffic from the EBDSP area followed by Kwinana Freeway. The primary internal roads connecting development on to Baldivis Road are projected to service in excess of 3,000 vehicles per day.

7.1 Road Network

7.1.1 Existing Surrounding Road Network

The existing road network in the vicinity of East Baldivis District Structure Plan area comprises the following:

- Baldivis road is a two lane un-divided rural road with an 80km/h speed limit, reducing to 70km/h just north of Zig Zag road.
- Mundijong Road is a two lane road extending east from Baldivis Road with an interchange at the Kwinana Freeway.
- Safety Bay Road is a four lane, divided arterial road with a dual lane roundabout at its intersection with Baldivis Road.
- Kerosene Lane, Eighty Road and Fifty Road are two lane rural standard roads extending west from Baldivis Road. Several new access roads have been constructed west of Baldivis Road at the southern end of the EBDSP area.

7.1.2 Proposed Surrounding Road Network

Baldivis Road has previously been identified as a *Neighbourhood Connector* in the North Baldivis Structure Plan.

Kerosene Lane, Eighty Road and Fifty Road will be classified as *District Distributor (A)* Roads subsequent to construction of Nairn Drive and Mundijong Road.

With traffic flows projected to increase to 16,000 vehicles per day due to the East Baldivis development, Baldivis Road will need to remain as a *District Distributor (B)* road (or an *Integrator B* under *Liveable Neighbourhoods*) with provision for a two lane boulevard treatment, and allowance for extra widening for turn lanes at intersections. These arrangements are consistent with what has been identified by the City of Rockingham in relation to the Baldivis Central, The Chase & Tuart Ridge estates. Cross sections and proposed dimensions are provided in the traffic report for all road reserve width scenarios, including those requiring upgrading.

7.1.3 *Proposed Structure Plan Roads and Intersections*

The traffic report provides recommendations with respect to roads and intersection treatments based on the road structure depicted in the EBDSP.

The traffic report also provides an indication of vehicle movements per day which have been modelled based on the proposed lot yield, the interaction of the proposed structure plan roads, and the proposed intersections to Baldvis Road.

The traffic report illustrates that the proposed layout of the internal road network will have sufficient capacity to distribute traffic effectively and efficiently to and within the EBDSP area based on anticipated trip types, and external distribution factors based on the location of surrounding attractions.

The east-west structure plan roads with between 3,000 and 7,000 vehicle trips per day at their connections to Baldvis Road should be classified as *Neighbourhood Connector A* roads, whilst the remaining structure plan roads should generally be classified as *Neighbourhood Connector B* roads since they either carry a bus route (refer section 7.2 below), or they connect to Baldvis Road.

Within the road network framework established by the EBDSP, low order roads, which can be determined at the Local Structure Planning stage, should be identified as *Access Streets B, C, or D*.

All of the proposed access roads for the EBDSP area also satisfy intersection spacing requirements as specified by AusRoads based on the hierarchical category of these roads as defined in the traffic report.

The traffic report indicates that left turn lanes along Baldvis Road will not be required. The traffic report also notes that right turn lanes can be accommodated within the existing 20 metre Baldvis Road reserve in a similar manner to existing Baldvis Estates.

7.2 **Bus Routes**

Currently there are no bus routes within the EBDSP area. The "*Baldvis Road Needs Study – Traffic*" identified a future bus route along Kerosene Lane, and then south through the North Baldvis Structure Plan area, with a second route through the centre of the EBDSP area.

The EBDSP Traffic and Transport report (**Appendix 4**) supports the bus routes proposed within the 'Baldvis Road Needs' – Traffic report.

7.3 **Pedestrians and Cyclists**

District pedestrian and cyclist networks will be accommodated primarily within the Tramway reserve east of Baldvis Road. In addition, footpaths and dual use paths will be suitably provided on all internal roads in accordance with *Liveable Neighbourhoods* objectives.

7.4 **Traffic and Transport Recommendations and Conclusions**

The Traffic and Transport report generally validates the road layout illustrated in the EBDSP.

The recommendations provided in the report with respect to minor road re-alignments and intersection treatments can be readily implemented at the local structure planning stage, given that the report demonstrates that additional traffic generated by the proposed development can be readily accommodated in the current and future surrounding road network.

8.0 PUBLIC OPEN SPACE

8.1 Background

The design of the public open space has been reviewed in accordance with WAPC's *Liveable Neighbourhoods* (LN) and the corresponding City of Rockingham Planning Policy 3.4.1 – Public Open Space.

In terms of the distribution of Public Open Space, Policy 3.4.1 states:

Location of Public Open Space

Liveable Neighbourhoods (2007) requires that POS should provide for Local Parks up to 3,000m² located within 150 to 300m of safe walking distance to all dwellings. Local Parks can include small parks, special purpose parks, children's playgrounds and squares.

Liveable Neighbourhoods (2007) requires that POS should provide for Neighbourhood parks of around 3,000 to 5,000 or larger, each serving about 600 – 800 dwellings and to be located a maximum of 400m walk from most dwellings.

Liveable Neighbourhoods (2007) requires that POS should provide for District Parks of 2.5 – 7.0 hectares, notionally serving three neighbourhoods, located within 600m – 1km walk from most dwellings. District Parks must be an adequate size and shape to accommodate both grassed areas for informal games and for organised sport.

8.2 Local Parks

The proposed EBDSP notionally illustrates District and Neighbourhood Parks only, given that Local Parks are best represented in subsequent Local Structure Plans.

8.3 Neighbourhood and District Parks

8.3.1 Position of District Open Space

At the time of preparing the EBDSP, the City of Rockingham was in the process of reviewing the distribution of future District Open Space (DOS) in the broader Baldivis locality. A preliminary review by the City had earmarked a large DOS on Lot 129, central to the EBDSP area; as this space would complement the existing 'Baldivis Reserve' DOS facility immediately to the west, situated within the North Baldivis DSP area.

The centrally located 'school precinct' design adopted and included within the DSP Map achieves both the City of Rockingham and DoE key objectives for the location and configuration of the DOS, High School and central Primary School as outlined below:

- a centrally located High School, Primary School and DOS have been provided over two landholdings either side of Zig Zag Road and adjacent to the existing Baldivis Reserve;
- the school precinct is provided with good transport connections and is surrounded by three *Neighbourhood Connectors*; Baldivis Road to the west, the north-south neighbourhood connector to the precincts east and the extension of Fifty Road running east west along the precinct's southern boundary;
- 4 hectares of DOS has been located adjacent to the Baldivis Reserve adjoining the tramway reserve providing a large, consolidated active sporting reserve with a high level of accessibility; and
- the High School site has been co-located with the DOS to provide for shared infrastructure provisions of the active playing fields.

The proposed co-location of a playing field with the future High School playing fields provides a 'de-facto' District Playing Field facility, when taking into consideration that three senior sized playing fields, including clubrooms facilities, will ultimately be provided in one central location. This central site may also include basketball/netball courts or tennis courts depending on demand, and is most likely to be accommodated on the future High School site.

8.3.2 *Position of 'Secondary' Open Space (Active and Passive)*

The two proposed 'secondary' active POS sites will serve the respective northern, and southern sections of the EBDSP area; each being in the order of 1.5ha+. These sites are proposed to be co-located with the designated Primary Schools, and are envisaged to support junior community sporting facilities. The central primary school is proposed to be a standalone 4ha site, however acknowledging an area of open space containing stands of remnant vegetation is provided between this site and the Tramway Reserve.

The design factors influencing the distribution of active POS areas are primarily the result of the site's elongated configuration and it being more receptive to smaller active POS catchment areas. These smaller catchments will therefore avoid:

- the 'overspill' of the active POS catchment into adjacent non-residential areas (i.e. rural, quarry, freeway reserve land uses); and
- the unnecessary overlapping of the adjoining active POS catchment areas pertaining to the North Baldivis DSP, and hence oversupply or uneven distribution of active POS facilities.

Passive Open Space will also be provided throughout the DSP area, including within the gas pipeline corridor, and the buffer area associated with a Resource Enhancement Wetland north of Mundijong Road.

The Baldivis Tramway, while not contributing to the EBDSP POS provision, will be a key route for pedestrians and cyclists in the area and will suitably function as a POS corridor similar to existing Baldivis Estates.

The total amount of 'Green Space' available within the project area is anticipated to be around 13 - 14% of the nett developable area. This percentage of green space takes into consideration the designated 'unrestricted', and the 'restricted' POS provisions prescribed by *Liveable Neighbourhoods*.

'Restricted' POS may include a portion of the gas pipeline corridor, wetland and associated buffer areas and drainage areas. The drainage requirements on site have been carefully considered so as to not encroach or impact on the functioning of the proposed active public open space areas. This matter can be further explored at the Local Structure Planning phase.

As identified within the RPS Environmental Assessment, remnant vegetation was identified for retention within Lots 1 and 2 Baldivis Road. As part of BEST Group response to the City of Rockingham request, for relocation of the DOS, High School and Primary School sites, further assessments of the remnant vegetation within Lots 1 and 2 and the tramway Reserve, was undertaken. The results found that the best quality vegetation and trees were located within the Tramway Reserve adjoining Lot 2 Baldivis Road, including a number of potential cockatoo breeding trees. Subsequently, the POS previously proposed on Lots 1 and 2 has been moved marginally north onto Lot 2 to provide a consolidated area of remnant vegetation adjoining the best quality vegetation within the Tramway Reserve.

8.3.3 *POS Provision within High Pressure Gas Transmission Pipeline*

In accordance with the City of Rockingham Planning Policy 3.4.1 – Public Open Space, the Dampier to Bunbury Natural Gas Pipeline will contribute to the overall POS calculations as follows:

- (a) Easement: to be deducted from gross subdivisible area (i.e. 100% deduction) and be a 50% credit towards 'restricted use' public open space;
- (b) Buffer: to form part of the gross subdivisible area (i.e. 0% deduction) and a 100% credit towards public open space.

The nature of any POS credits can only be determined once the Risk Assessment and Pipeline Management Plan is prepared as part of the relevant Local Structure Plan. As such, the LSP will also determine the nature of any POS credits within the Pipeline easement and buffers, and will be generally in accordance with the WAPC's *Liveable Neighbourhoods* and the City's Public Open Space local planning policy.

8.3.4 *Public Open Space Integration with Drainage*

The potential integration of POS and drainage areas will be explored in further detail at the Local Structure Planning phase. It is recognised that there may be opportunities to integrate POS and drainage areas, and that drainage areas may potentially be partially incorporated (credited) towards the developer's provision of POS (10% of gross subdivisible area). It is recognised that suitable design of drainage areas can contribute to a legitimate and useable passive open space function, pursuant to guidance under *Liveable Neighbourhoods* and the City's Planning Policy 3.4.1 – Public Open Space.

Liveable Neighbourhoods in itself requires the provision of 8% unrestricted open space as a minimum with up to 1:5 year stormwater storage areas forming the remaining 2% of restricted open space. The co-location of unrestricted and restricted open space areas therefore becomes a landscape design and management matter, which is more appropriately considered and addressed at the LSP and subdivision phases through the preparation of Landscape Master Plans and subsequent Management Plans.

9.0 SUSTAINABILITY

Firm objectives are required to ensure that the future development of the EBDSP area will meet the needs of current and future generations through integration of environmental protection, social advancement and economic prosperity.

Some of the key criteria identified in the State Sustainability Strategy, which are relevant to the future development of the EBDSP area, are:

- To value and protect our environment and ensure the sustainable management and use of natural resources; and
- To plan and provide settlements which reduce the ecological footprint and enhance our quality of life.

In practical terms, sustainability principles can be readily incorporated into a detailed Local Structure Plan, which will ensure that various measures are implemented at the development stage. Such measures would typically include:

- The retention of existing remnant vegetation within the development area wherever practicable;
- Environmentally/site responsive design to minimise earthworks and natural ground disturbance;
- Responsiveness to greenhouse gas emissions and climate change through the implementation of greenhouse gas abatement measures if practical;
- Preservation of buffers to surrounding wetlands;
- Minimising the disturbance of Acid Sulfate Soils;
- Incorporating good solar access and orientation in the design of lots;
- Application of water sensitive urban design to facilitate the integration of the land use and water planning systems;
- Encouraging water conservation by maximising the retention, detention and re-use of stormwater by maximising local recharge of groundwater, and by wastewater re-use and water harvesting.
- Response to community needs and identity;
- Physical and visual access to public open space;
- Flexibility and robustness in urban design;
- Recycling and re-use of materials;
- Use of local materials and services;
- Accessibility to public transport;
- Places that encourage cycling and walking; and
- Growth and design of activity centres and transport corridors.

10.0 IMPLEMENTATION

10.1 Coordinated Provision of Major Service and Community Infrastructure

In large development areas with multiple landownership, the funding of service infrastructure is often implemented via Developer Contribution Schemes (DCS). DCS items normally relate to broad scale infrastructure, including district distributor roads, arterial drainage and drainage disposal sites, the pre-funding of services headworks and temporary services headworks. Pursuant to the recently released statement of Planning Policy 3.6, some community infrastructure items can also be included in the DCS.

The DCS provides the basis for the apportionment of the infrastructure costs between the various landowners and can include details of works programmes, timings for payments and pre-funding arrangements between landowners, etc.

Development of the East Baldivis project area will necessarily need to be supported by the extension/upgrade of major service and community infrastructure to be equitably provided by the landowners. The City of Rockingham however has avoided the use of DCS's where possible, preferring instead to have the necessary servicing arrangements secured through agreements with landowners or via Local Structure Plans and/or subdivision approval conditions (e.g. the progressive ceding of Nairn Road at Baldivis). Furthermore, the need for a DCS for the East Baldivis DSP area is less pertinent as there are only a small number of individual landowners, and each of the respective landholdings are large in area. Formal DCS arrangements are not necessarily required under these circumstances, particularly where direct negotiations and agreements for cost sharing items is supported by all parties involved.

In light of the above, the collaborative land owner environment at East Baldivis will facilitate the less formal approach, with key infrastructure items to be provided on an equitable basis between the major landowners involved. To this end, and as defined by the District Structure Plan, in most instances key items are proposed to be delivered as follows:

10.1.1 *Widening and Upgrading of Baldivis Road*

Respective landowners will be required to upgrade the relevant abutting section of Baldivis Road pursuant to conditions of subdivision approval.

10.1.2 *District Open Space and Primary Schools*

The location of Primary School and District Level Open Space sites has occurred based on two key objectives. The first relates to providing such infrastructure based on equitable walkable catchments for residents within the EBDSP. The second relates to the equal distribution of such infrastructure as a cost sharing item for each respective landowner. This approach has resulted in the following community infrastructure allocations.

Table 10.1.2 – Cost Sharing

Proposed Shared Infrastructure	Approximate Land Area (Total)	Relevant Land Owner(s)
Co-located Northern Primary School & Open Space	5ha	BGC (Lot 459) & Cedar Woods (Lot 460)
Co-located Central Primary School & Open Space	4ha	Perron Group (Lots 5, 6)
High School and co-located District Open Space	13.5ha	Peet Ltd (Lot 129) and Perron Group (Lots 521, 2, 1)
Co-located Southern Primary School & Open Space	5ha	Private Owner (Lot 750) & Perron Group (Lot 921)

As noted in the table above, a centrally located 4 hectare District Open Space site is to be co-located with the High School provided within the school precinct. The positioning of the High School site takes opportunity of its location central to the North and East Baldivis District Structure Plan Areas; and acknowledging this land will be purchased by the DoE in due course.

The Primary Schools sites will be respectively jointly shared by the different landowners. Thus the physical accommodation of the community infrastructure on a shared basis eliminates the need for a financial (DSC) model to be engaged.

Critically, any significant re-organisation of these sites will increase the need for a DCS.

10.1.3 Arterial Drainage

In the first instance, the required alignment, land take and physical construction of arterial drainage is to be proportionately met by landowners within their respective landholdings. Any required major downstream infrastructure burden on a particular landowner will be resolved amongst the major landholders pursuant to the Local Water Management Strategy specifications and if necessary secured through a Legal Agreement.

10.1.4 Arterial Sewer

Any required extension of trunk sewer mains to the area and/or associated pump stations and designated pump station sites will be equitably funded and secured through legal agreements between the participating major land owners.

10.1.5 Arterial Water

Any required extension of trunk water mains to the area will be equitably funded and secured through legal agreements between the participating major land owners.

In summary, most common infrastructure items will be physically delivered by landowners on a proportionate ownership basis. Where an item is to be delivered through monetary contributions, it is considered that cost sharing arrangements can be appropriately managed and implemented through direct negotiations and legal agreements between the landowners and relevant agencies (e.g. Council, Water Corporation, etc).

10.2 Adoption of District Structure Plan

The DSP is intended as a broad district level land use strategy defining the strategic planning framework for the project area. The DSP forms the framework for more detailed Local Structure Planning over the duration of the project, which will be developed to reflect changing planning circumstances, demographics, community needs and market demands. The DSP is a robust planning document that will be refined by the more detailed Local Structure Planning, with elements contained in the Plan changing in response to more detailed analysis and changing trends.

10.3 Local Structure Planning

Following the lodgement of the DSP to the City of Rockingham and WA Planning Commission, various independent Local Structure Plans will be undertaken by respective landowners and prepared in accordance with the provisions and requirements of the City of Rockingham Town Planning Scheme No. 2. The LSPs (guided by the broad framework of the DSP) will define detailed planning objectives for each of the selected development areas based on the opportunities and constraints of that particular area. The timing of the LSPs and subsequent subdivision will be determined by each respective land developer.

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