"Wellard West"
Land bounded by the Kwinana Freeway, Mortimer Road and Johnson Road, Wellard

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1. INTRODUCTION

This report provides justification for the Local Structure Plan (LSP) prepared for land located on the corner of the Kwinana Freeway, Mortimer Road and Johnson Road, Wellard. The report is prepared by Cardno BSD on behalf of Cedar Woods Wellard Ltd (Cedar Woods) the owners of Lot 200 Johnson Road, Wellard. The LSP area incorporates all of the landholdings referred to as "Wellard West" which, in addition to the land owned by Cedar Woods, includes Lots 1, 21 and Ptn 22 Mortimer Road and Lot 155 Johnson Road. A locality plan comprises **Plan 1**.

The LSP recognises the opportunities and constraints of the area, particularly in terms of the location, configuration, topography and environmental features of the site as well as the drainage requirements reflected in the Local Water Management Strategy (LWMS) which accompanies this LSP report.

The LSP will guide the subdivision of the site and ensure that development proceeds in a sustainable manner facilitating the objectives of the Western Australian Planning Commission (WAPC), as advocated through 'Liveable Neighbourhoods' and 'Network City' and in accordance with the objectives of the Town of Kwinana.

1.1 BACKGROUND

The LSP has been prepared in accordance with Clause 4.18.2.4 in the Town of Kwinana Town Planning Scheme No. 2, which requires an LSP to be prepared for the subject area prior to consideration and approval of an application for subdivision and/or development of the land. The LSP provides the planning framework for the development of "Wellard West" and establishes a context for the consideration and eventual approval of subdivision applications for the area.

In May 2005, the LSP area was rezoned from 'Urban Deferred' to 'Urban' under the Metropolitan Region Scheme (MRS) to facilitate the objectives of local and state planning policies and initiatives (refer **Plan 2**). To ensure consistency between the MRS and the local Scheme, the LSP area has recently been rezoned under the Town of Kwinana Town Planning Scheme No. 2 (Amendment No. 91) from 'Rural A' to 'Residential' with a base coding of R20 (refer **Plan 3**).

2. SITE DESCRIPTION

2.1 LOCATION

The LSP area is located approximately 34 kilometres south of Perth's Central Business Area and totals some 61.66 hectares as indicated in **Plan 4**. The LSP area is situated wholly within the Town of Kwinana and is bounded by Mortimer Road to the north, the Kwinana Freeway to the east, a drain to the south and Johnson Road to the west.

2.2 LAND OWNERSHIP

The LSP area contains several land parcels and various reserves, as outlined in Table 1 below:

Table 1: Lot Description, Ownership and Areas

LAND DESCRITPTION	OWNER	LAND AREA (Ha)
Lot 200 Johnson Road	**Cedar Woods Wellard Ltd**	**47.61**
MRWA Land	(proposed to be acquired by CWP)	1.29
Other Private Landholdings	various	12.29
TOTAL LANDHOLDINGS		**61.19**
Drainage Reserve (across POS 4)	Water Corporation	0.35
Lot 21 Drainage Reserve	Water Corporation	0.12
TOTAL AREA		**61.66**

2.3 EXISTING LAND USE

The LSP area is currently used for mixed agricultural purposes. The majority of the land is cleared farmland interspersed with dwellings and small pockets of remnant bushland. An aerial photograph of the LSP area comprises **Plan 5**.

2.4 SURROUNDING LAND USE

The surrounding land consists mainly of cleared farmland occupied by rural-residential properties. Three significant wetland features are present on the east side of Kwinana Freeway, two of which are classified as Resource Enhancement and one a Conservation Category Wetland (CCW). To the west of the LSP area is Bollard Bulrush Swamp, which is currently categorised as two wetlands by the Department of Environment and Conservation (DEC) Geomorphic Wetlands Dataset, one being classified as 'Resource Enhancement' whilst the other is classified as 'Multiple Use'.

The locality is undergoing significant change as a result of urbanisation to the north and west of the LSP Area and this process is creating new residential communities, retail and educational facilities and major public and private transport infrastructure.

3. ENVIRONMENTAL SITE ANALYSIS

3.1 PHYSICAL DESCRIPTION

A mixture of agricultural land uses is evident within the LSP area. Most of the LSP area has been cleared of native vegetation for pasture but has also been used for other purposes such as a plant nursery, piggery and for sand extraction. The LSP area does not contain significant wetland areas or any environmental or physical constraints to development other than the existing drainage network in the southern portion of the site.

Plan 5 (the aerial photograph of the LSP Area) confirms that there are no physical constraints to development.

3.2 TOPOGRAPHY

Topographic contours of the LSP area obtained from the Department of Water's (DoW) *Perth Groundwater Atlas* database reveal the LSP area has a slightly undulating topography that ranges in height from 9 metres Australian Height Datum (AHD) to 23 metres AHD. The highest point occurs within the north eastern portion of the site and reduces in height towards the south western corner.

3.3 SOIL TYPES

The LSP area is located on the Swan Coastal Plain, which is a flat to undulating plain, 20 to 30 kilometres wide that extends from Gingin in the north to Busselton in the South. This geomorphic entity has been formed during different periods of deposition and its soils have been subject to varying degrees of leaching and formation.

The soil within the LSP area consists of grey loamy sand, which is consistent with the soil mapping by Heddle *et al.* (1980) that indicated the subject site is part of the Bassendean dune system. Within this dune and sand plain system the subject site lies within sub-unit B6, which is a "*broadly drained sand plain with a deep grey siliceous sands or bleached sands, underlain at depths generally greater than 1.5m by clay or less frequently a strong iron-organic pan. Imperfectly drained soils.*"

3.4 VEGETATION

The LSP area has been highly disturbed as a result of its historical development, which has ranged from grazing to a plant nursery, piggery and sand extraction. This has resulted in scattered areas of regrowth shrublands and little of the site retaining remnant vegetation in a good condition. However, the native vegetation that does remain intact is rated in parts as being in excellent condition and where possible this vegetation will be retained in Public Open Space (POS).

Justification for the location of POS shown on the LSP is provided in a later section of this report.

3.5 GROUNDWATER

Groundwater levels for the site were obtained from the DoW's *Perth Groundwater Atlas* database and reveal that the groundwater levels ranged from 8 metres to 4 metres below the ground surface. The greatest depth to groundwater occurred within the north eastern portion of the site and decreased to 4 metres below the ground surface at the south western corner, indicating groundwater flow is in a south westerly direction (Department of Environment, 2004).

For the past 18 months, Cardno BSD has been monitoring water quality and quantity within the LSP Area. The groundwater Sampling and Analysis Plan (SAP) was formulated to enable collection of baseline data in consideration of the requirements specified in *Framework for Developing the Jandakot Water Resources Management Strategy* (Parsons Brinkerhoff, 2004), relevant DOE guidelines and the *National Water Quality Management Strategy* (ANZECC, 2000).

The groundwater levels of the LSP Area, measured during sampling in October 2005 (at the locations provided in **Plan 6** attached), are indicated in the table below and correlate well with those in the *Perth Groundwater Atlas*.

Table 2: Groundwater Levels within the LSP Area

Bore ID	GW level (mAHD)
WW1	10.32
WW2	10.01
WW3	6.43
WW4	6.25
WW5	8.40
WW6	9.17
WW7	5.59
WL2	6.26
WL4	8.73
WL5	6.32

Maximum groundwater levels can be expected to occur between September and October each year after the winter rains, therefore the groundwater levels measured can be considered to be representative of the maximum values for 2005.

Analysis of groundwater levels within nearby DOE monitoring bore (Bore ID 3057) indicate that the maximum levels show a declining trend. Given that 2005 had been an above average rainfall year and that maximum groundwater levels have fluctuated less than 0.5m for approximately the last 18 years at Bore 3057, the groundwater levels recorded and contours subsequently plotted can be considered to provide a reasonable estimation of AAMGLs across the site. These values vary from 6m – 12.5m across the site and the associated contours inferred are shown on **Plan 6**.

When combined with topographic maps the depth to groundwater contours can also be calculated and these values vary from 1m – 13m across the site and are depicted in **Plan 7**.

Some parts of the LSP Area exhibit a minimal surface to groundwater separation distance, indicating that future earthworks may need to include filling of some areas or the use of subsurface drainage to achieve the minimum floor levels required by relevant building standards. Any dewatering that occurs will require an Acid Sulphate Soils (ASS) assessment.

Summary results for the first round of water quality sampling from October 2005 are indicated below:

Table 3: Groundwater Nutrient Levels Within the LSP Area

Parameter Bore ID	Eh (mV)	pH	EC (ms/cm)	TN (µg/L)	TP (µg/L)	Ortho-P (µg/L)	NH_3 (µg/L)	NO_x (µg/L)	TKN (µg/L)
WW1	324	7.02	0.16	5700	64	12	70	4700	1000
WW2	248	7.72	0.17	900	150	2	160	460	400
WW3	275	7.14	0.21	2800	95	4	27	2300	400
WW4	334	7.07	0.62	29000	21	3	4	22000	7400
WW5	220	7.63	0.2	2400	1400	8	220	24	2400
WW6	225	6.66	0.27	2800	680	13	9	51	2800
WW7	217	6.51	0.48	860	180	110	5	8	900
WW7D	122	7.01	0.73	660	300	8	230	120	500
WL2	311	7.11	0.21	10000	56	36	14	8800	1600
WL4	162	7.12	0.3	2500	190	62	810	1300	1200
WL4D	134	7.04	0.73	520	110	7	230	91	400
WL5	333	6.59	0.44	1700	70	67	11	18	1700

WW4 and WL2 recorded high nutrient levels:

- Bore WW4 was identified as being a nutrient “hotspot” and is located in the area previously used as a piggery. As such nutrient levels can be expected to be elevated in this location as a result of the vertical migration of nutrients from the surface; and

- Bore WL2 is located adjacent to and hydraulically upstream of WW4. Previous land uses above WL2 include pasture growth and sand excavation and would not be expected to cause excessive nutrient levels.

The monitoring indicates that both surface and groundwater exhibit widely varying values. Of particular interest are the high nutrient values recorded for several sites. It is likely that management measures will be required to address the elevated levels. These are provided for in the Local Water Management Strategy (LWMS) and will be further addressed in subsequent management plans for the areas as development progresses.

In comparison to surface water quality, the nutrient levels experienced at many of the groundwater sites substantially exceed the surface water values. This suggests that surface water quality may be expected to decline with time as the nutrient rich groundwater migrates towards surface water bodies The analysis of oil underlying site WW5 shows high nutrient concentrations. Site WW5 is within the area historically used as a piggery. Groundwater samples from WW4, which is adjacent to WW5, indicate extremely high nutrients within the groundwater (in comparison to other groundwater bore locations).

3.6 CONTAMINATED AREAS

A former piggery, decommissioned in 2001, was located on Lot 2 Johnson Road. In light of this previous land use, the soil on this site was assessed for possible contaminates including hydrocarbons, metals and pesticides in accordance with Department of Environment (DoE) guidelines. The report of this assessment has been submitted to the Town of Kwinana and the DoE.

Areas identified as possibly being contaminated included the old piggery sheds where effluent was pumped or moved via gravity flow to unlined infiltration pits on either side of the sheds and in two large lined effluent pits located south of the piggery sheds. Site investigations showed slightly elevated levels of copper and zinc, which were subsequently removed by excavating the pits to a depth of 1.5 metres. The effluent in the two lined ponds was allowed to evaporate over summer and the remaining solids removed.

The remediation of the site in response to the previous land use activities was undertaken to ensure the site was not precluded from future urban development and is no longer a contaminated site under the *Contaminated Sites Act 2003.* Advice to/from the Department of Environment and Conservation (DEC) on this matter is attached in **Appendix A**.

3.7 INDIGENOUS HERITAGE SITES

The Department of Indigenous Affairs (DIA) has confirmed that there are no sites of Aboriginal heritage contained on the Interim or Permanent Register within the LSP area. A site was identified to the south of the LSP area under the Jandakot Structure Plan but is not be affected by the “Wellard West” LSP.

3.8 EUROPEAN HERITAGE SITES

The Wellard School Site is located on Lot 155 Johnson Road and is listed on the Town of Kwinana’s Municipal Heritage Inventory (MHI) as a place of European Social Heritage. Whilst the building on site has subsequently been demolished, the site itself remains a place of significance.

3.9 TREE SURVEY FINDINGS

Cardno's Environmental Department conducted a tree survey of the LSP area during February 2007.

3.9.1 Identified Plant Communities

- 68 flora species were recorded within the LSP area from 28 Families and 58 genera;
- Vegetation condition ranged from "Completely Degraded" to "Excellent" with a majority of the vegetation in "Degraded" to "Very Degraded" condition;
- Five plant communities were described as follow (refer **Plan 8**);

1. S1: Thicket of *Kunzea glabrescens* with occasional emergent *Eucalyptus marginate* subsp. *marginata* and *Banksia menziesii* over *Gompholobium tomentosum* over introduced grasses.
2. S2 : Scrub to Thicket of *Kunzea glabrescens* with emergent *Eucalyptus marginate* subsp. *marginata*, *Allocasuarina fraseriana* and *Banksia* spp. over *Jacksonia furcellata* and *Hibbertia hypericoides* over *Mesomelaena pseudostygia* and *Phlebocarya ciliata* on grey sands in shallow depressions.
3. W1: Open Woodland of *Eucalyptus rudis* and *Melaleuca preissiana* over occasional *Melaleuca teretifolia* over a ground layer of *Carpobrotus edulis* and introduced grasses on grey sands in winter– wet depressions.
4. W2: Woodland of *Eucalyptus rudis* over *Juncus pallidus* over **Cynodon dactylon* and other introduced grasses on grey/brown sands in shallow drainage line.
5. D1: Mixed grassland of introduced pasture species with occasional native or exotic trees and shrubs on sands.

3.9.2 Tree Survey Recommendations

In relation to this information, the following recommendations were made in regard to retaining vegetation within the LSP area:

- Retain vegetation community S2 intact to the extent possible as it is currently in "Excellent" condition and has high biodiversity values, habitat values and aesthetic, social and economic values.
- Retain large mature Tuart (*Eucalyptus gomphocephala*) tree where possible for high ecological, social, aesthetic and economic values.
- Retain large to medium sized mature native trees where possible within W1, W2 and D1 for limited biodiversity values, limited habitat values, hydrological values and aesthetic, social and economic values. Trees that should be retained include *Eucalyptus rudis* (Flooded Gum), *Eucalyptus marginata* subsp. *marginata* (Jarrah) and numerous other mature tree species and shrubs.
- Retain larger mature exotic trees within D1 where possible for limited habitat value, hydrological values and aesthetic, social and economic value. Trees that should be retained include exotic *Eucalyptus* spp, Morten Bay Figs and numerous other exotic species.
- Vegetation community S1 has limited retention value except for a number of emergent mature trees within the northern portion of the site. These trees should be retained where possible and include *Allocasuarina fraseriana, Nuytsia floribunda* and *Banksia* spp.

3.9.3 Tree Survey Conclusion

Where possible, portions of plant community S2 should be retained to supplement active areas of Public Open Space (POS) due to the high quality of the vegetation condition. The remainder of the LSP area holds little biodiversity significance due to historic land use activities. However, significant mature trees should be retained within the development area to aid in hydrological function/drainage and add aesthetic, social and economic value to the development site. These recommendations were given due consideration when finalising the LSP design.

Justification for the location of Public Open Space (POS) shown on the LSP is provided in a later section of this report.

4. STATUTORY AND PLANNING CONSIDERATIONS

4.1 METROPOLITAN REGION SCHEME

In May 2005, the LSP area was rezoned from 'Urban Deferred' to 'Urban' under the MRS to facilitate the objectives of local and state planning policies and initiatives (refer **Plan 2**).

4.2 TOWN OF KWINANA TOWN PLANNING SCHEME NO.2

To ensure consistency between the MRS and the local Scheme, the LSP area is zoned 'Rural A'. However, an amendment has been initiated to rezone the LSP area to 'Urban Deferred'.

4.3 SOUTH WEST CORRIDOR STRUCTURE PLAN

The South West Corridor Structure Plan (SWCSP) identifies Lots 2, Ptn 8, Ptn 65 Johnson Road and Lots 1, 21 and Ptn 22 Mortimer Road as "*Category A1 future urban land"* and Lots Ptn 87 and 155 Johnson Road as "*Category A2 future urban land"*, therefore the proposed LSP is consistent with the SWCSP.

4.4 JANDAKOT STRUCTURE PLAN

The intent of the Jandakot Structure Plan (JSP) is to plan and co-ordinate the development of the broader location while balancing environmental issues following a number of reviews and studies of the area (refer **Plan 9**). The JSP was endorsed by the Western Australian Planning Commission (WAPC) in August 2007 and recognises potential development areas and proposes indicative district road layouts and locations for community facilities whilst retaining environmentally sensitive features such as wetlands. The JSP is based on the principles of Liveable Neighbourhoods and seeks to accommodate the projected growth of the South West Corridor.

The JSP proposes urban development in the Jandakot region over three timeframes – short (0-5 years), medium (5 – 10 years) and long term (10+ years). Five Urban precincts are identified in the JSP study area. The "Wellard West" area is included wholly within 'Area 2 – Bertram/Wellard'.

Area 2 is comprised of approximately 360 hectares and extends north and south of Mortimer Road. The estimated maximum population of Area 2 is 9,840 of which it is expected that 4,880 people be accommodated in the precinct by 2026. The Area is earmarked for short-term development.

Urban development within Area 2 of the JSP will:

- Strengthen the patronage of the existing centres of Kwinana, Orelia and Parmelia; and to the north in the City of Cockburn.
- Generate commercial opportunities and new employment markets in the existing areas.
- Support the proposed rail stations at Thomas Road, South Parmelia and Leda with 'Transit Orientated Development' (TOD).
- Support the Leda Town Centre.

The JSP is based on the principles of Liveable Neighbourhoods and these principles have been applied to the LSP. The final Jandakot Structure Plan is expected to be released in the near future.

4.5 NETWORK CITY

"Network City: Community Planning Strategy" highlights key elements of planning for the future of Perth, Mandurah and Murray. The key objectives of the strategy span the breadth of "*Network City"* and include:

- Deliver urban growth management
- Accommodate urban growth primarily within a Network City pattern
- Align transport systems and land use to optimise accessibility and amenity
- Deliver a safe, reliable and energy-efficient transport system
- Protect and enhance the natural environment, open spaces and heritage
- Deliver for all a better quality of life, building on existing strengths
- Deliver a city with 'urban' energy, creativity and cultural vitality
- Provide a city plan that will provide certainty and deliver results

The LSP for "Wellard West" is considered to be consistent with the aforementioned objectives of "*Network City"* by having identified and addressed inequities in the distribution of services and access to lifestyle opportunities within the locality and delivering housing diversity, including increased residential densities, in a location that is well serviced by public transport infrastructure.

4.6 LIVEABLE NEIGHBOURHOODS

The LSP has been generally designed in accordance with the provisions and principles of 'Liveable Neighbourhoods', in particular the road design. 'Liveable Neighbourhoods' encourages street networks that have a high level of internal connectivity and good external linkages to cycle, pedestrian and bus networks. The road design should also be legible and minimise car travel.

Another key provision in Liveable Neighbourhoods is the promotion of walkable access to activity nodes or destinations with a general requirement for 400 metre walkable catchments. In this case, the location of Public Open Space within the LSP Area and the Commercial Site are of relevance. This is further discussed in Section 7 of this report.

Liveable Neighbourhoods require Local Structure Plans to specify residential densities and encourages diversity in residential densities and dwelling types thereby providing more choice for changing household types. Residential densities proposed in the LSP are addressed in Section 7 of this report.

4.7 OTHER GUIDELINES AND POLICY

The Town of Kwinana advertised their Draft Local Planning Strategy in 2006. The Strategy identifies areas likely to accommodate land uses including residential, industrial, commercial and civic uses. The advertised Local Planning Strategy is consistent with the provisions of the Draft Jandakot Structure Plan as it identifies "Wellard West" as suitable for low-density residential development with some opportunities for medium-density development.

The Town of Kwinana's Local Housing Strategy was recently adopted by Council and identifies the LSP area as presenting an opportunity for high quality residential development based on the principles of Liveable Neighbourhoods.

4.8 EASTERN RESIDENTIAL INTENSIFICATION CONCEPT

In 2005, the Town of Kwinana prepared a more detailed District Structure Plan (DSP) and supporting documentation for the area covered by the Jandakot Structure Plan (JSP). This plan is referred to as the Eastern Residential Intensification Concept (ERIC). The purpose of ERIC was to provide sufficient justification for the Western Australian Planning Commission (WAPC) to progress Amendments to the MRS for the non-Urban areas within the JSP by showing in more detail the potential urban form of development in the JSP area and addressing a range of planning, environmental and servicing issues.

ERIC was advertised in late 2005 with submissions closing in March 2006. Cardno BSD lodged a submission on behalf of a number of landowners in the ERIC area. With respect to the LSP Area, the content of ERIC was generally supported, however, Cardno BSD did seek clarification regarding a number of matters as summarised below.

4.8.1 Buffers

Two (2) land uses are located in the general vicinity of the LSP Area, being a livestock-holding yard with an odour buffer, and a jet-ski park with a noise buffer. It was suggested that these buffers could have some impact on future residential development. This contention was considered by Cardno BSD to be unjustified.

The Environmental Protection Agency (EPA) has previously commented upon residential development for the "Wellard West" area during the lifting of the Urban Deferment. In May 2004, in commenting on the MRS Amendment the EPA did not raise any concerns with regard to the existence of the livestock-holding yard or the jet-ski park, although both uses were established and in full operation.

4.8.2 Livestock Holding Yards

The livestock-holding yard is in an adjoining suburb and does not pose a direct threat to residential development. As stated in ERIC, there have been few complaints involving this operation, despite the fact that there are numerous established homesteads and 'Special-Rural' dwellings within the 500 metre and 1000 metre EPA buffers, with some less than 300 metres away.

Cardno BSD suggested that any buffer should only be measured from the actual sheds and associated yards, and not the adjacent homestead and grazing paddock. If the livestock operation were to significantly expand their operations and develop the low-intensity paddocks into operations (similar to the holding yards in question), the landowner would be required to submit a Development Application and demonstrate that the proposed uses would not affect future 'Residential' and current 'Special-Rural' land uses.

There are no residential lots within the current LSP area affected by the Livestock Holding Facility Buffer. However, where there is a potential for impact associated with this use, the Town may seek the imposition of appropriate conditions on subdivision/development. This may include notifications being placed on the certificate of title of affected new lots.

4.8.3 Jet Ski Park

The Jet Ski Park located to the south of the LSP area in Baldivis, is afforded a considerable noise buffer under ERIC. This buffer extends a significant 3.5 kilometres from the source. The buffer has been supposedly based on a 2005 'Herring Storer' noise consultant report, which is neither in ERIC nor is it available to the general public.

It is known, however, that the Jet Ski Park have commissioned this report with the objective of modifying their activities to reduce noise levels, as recommended by the Herring Storer report. It is understood that the Club has taken such measures and reduced their impact on surrounding residential properties (which in any case did not cause concern to the EPA when the MRS rezoning for "Wellard West" was referred to them). Furthermore, there is a considerable distance (1.5 kilometres) between this facility and the LSP Area.

It is therefore considered that the method used to create this noise buffer is not transparent to affected landowners or the general public, and may also be obsolete. As a consequence it was requested that the buffer be reduced to a more reasonable and appropriate size, allowing unrestricted residential development over the LSP Area. Where it is considered there is a potential for impact associated with this use, the Town may seek the imposition of appropriate conditions on subdivision/development. This may include notifications being placed on the certificate of title of affected new lots.

4.9 DEVELOPER CONTRIBUTIONS

ERIC makes reference to Developer Contributions being required for major works within the DSP area but the extent of these works and the likely required contribution has not been quantified. It is understood these will be resolved during the local Scheme Amendment phase for land in the DSP area as is currently occurring for "Wellard West". Cardno BSD requested to be kept informed with regard to the development and finalisation of Developer Contributions and be consulted as to the appropriateness of any contributions levied prior to their incorporation into the Scheme.

In summary, Cardno BSD considers that ERIC is a comprehensive document appropriate for District Structure Planning purposes and the DSP generally reflects Cedar Woods development intentions for the LSP Area.

5. CONTEXT ANALYSIS

5.1 INTEGRATION OF LOCAL STRUCTURE PLAN

The LSP area is proposed to be surrounded by residential development under the provisions of the Jandakot Structure Plan.

As the wider locality continues to grow it will result in more public and private services being provided and more economic activity. This will make the area more economically and socially sustaining, lessening the need for residents to travel outside the area. Nevertheless, the LSP Area is connected to the existing Kwinana Freeway via the Mortimer Road access ramp and is therefore conveniently accessible to and from the Perth Central Business District (CBD), the Rockingham Regional Centre (via Bertram Road) and the wider metropolitan area.

5.2 TRANSPORTATION ROUTES

5.2.1 Public Transport

In accordance with key objectives in 'Network City', future residents of the LSP Area will have access to nearby transport infrastructure, in particular the Wellard Rail Station that is currently being developed as part of the Southern Suburbs Railway Project. The Station is located near the corner of Bertram Road and Challenger Avenue and is approximately 1.25 kilometres west of the LSP Area. Services for this railway line are proposed to begin operation later this year, well before the development of the LSP Area. The proposed station also provides parking, which will allow for 'park and ride' to occur.

There are also existing public transport services available to residents in the area. Bus services available to the LSP Area include the 130, which connects the Kwinana Bus Station with Johnson Road south of Mortimer Road (adjacent to the LSP Area). Additionally, the 128 and 129 bus services connect the Kwinana Bus Station with the suburb of Orelia, which is located about 1.5 kilometres to the north west of the LSP Area.

It is envisaged that when the Wellard Rail Station becomes operational, additional bus services connecting "Wellard West" to the station will be implemented.

5.2.2 Cycling and Pedestrian Network

The proposed LSP is considered to provide good permeability for cyclists and pedestrians. The LSP proposes two (2) links to the Kwinana Freeway dual use path adjacent to the LSP Area (refer **Plan 10**).

5.2.3 Regional Transportation Routes

The Kwinana Freeway abuts the LSP Area to the east and Mortimer Road (which forms the northern boundary of the LSP Area) facilitates access to the Freeway in both a northern and southern direction and therefore provides exceptional access to the metropolitan road network.

6. SUSTAINABILITY CONSIDERATIONS

6.1 PAIR-WISE COMPARISON

6.1.1 Methodology

Achieving a best practice planning outcome from the development of "Wellard West" brings about the need to find the right balance between the corporate objectives of Cedar Woods and fulfilling the planning considerations which require the implementation of sustainable land use solutions.

The 'Pair-Wise Comparison' tool assists in finding the right balance between these objectives. It is a divide and conquer problem-solving technique. Developed by Cedar Woods, it determines the weighting of various objectives on a comparative basis, having regard to their particular importance and relevancy to the subject site. The Pair-Wise Comparison assessment applied to the "Wellard West" LSP involved the following steps:

Step One: Identify the Objectives to be Ranked

The corporate objectives of maximising returns remain the primary objective of Cedar Woods. Strongly related to this is the need to ensure the lot size and built-form promote quality development and are supported by a strong market to ensure financial objectives are met. Consequently, the corporate objectives are automatically proportioned the highest weighting and there is no need to consider them comparatively with the Sustainable Community Objectives. Therefore only the weighting of the Sustainable Community Objectives is necessary for the evaluation process.

Step Two: Pair-Wise Comparison of Criteria

The Sustainable Community Objectives are then weighted by developing a Pair-Wise Comparison matrix. Each objective is scored against the other by comparing the significance or importance of one criteria over another.

Step Three: Weighting of Sustainability Community Objectives

The Sustainability Community Objectives are 'weighted' by comparing one objective against the other to determine which is the most important. This process is called the 'Pair-Wise Comparison'. The degree of importance is measured on a scale of 1 to 3 as follows:

- 3 points – major preference
- 2 points – minor preference
- 1 point – no preference

The number of times a Sustainability Community Objective is nominated as having a greater importance determines it weighting.

6.1.2 Outcomes

As a result of completing the aforementioned steps the Sustainability Community Objectives for the "Wellard West" Local Structure Plan were ranked as follows:

1. **Optimise intensity and mix of development**
   Optimise density and land use mix to facilitate efficient use of land, infrastructure and resources
2. **Housing diversity**
   Promote accessibility, adaptability and affordability in housing choice to meet the changing needs of the population
3. **Green estates and buildings**
   Provide for resource efficient, comfortable and healthy buildings through energy efficient lot configuration and building controls
4. **Urban water management**
   Manage the total water cycle in a manner that promotes efficiency and preserves ecosystem health
5. **Public Open Space (POS)**
   Provide 10% open space, preserve biodiversity, promote healthy lifestyles, maximise use by integration with activity nodes and optimise local density
6. **Walking and cycling**
   Promote walking and cycling as an alternative to motorised transport and as a recreational pursuit
7. **Sense of place**
   Create local identity
8. **Interface management**
   Minimise any adverse impact to and from potentially conflicting land use and infrastructure
9. **Infrastructure co-ordination**
   Promote cost efficient provision of infrastructure and services for the benefit of future residents, businesses and the wider community
10. **Environmental enhancement**
    Actively seek to remediate, protect and enhance areas of environmental significance and protect biodiversity
11. **Building community and place activation**
    Provide facilities, services and initiatives that stimulate community development, business and community interaction and sense of place
12. **Connectivity**
    Provide for efficient personal and commercial transport connections to local and regional destinations

The Pair-Wise Comparison matrix for "Wellard West" is attached in **Appendix B.**

7. THE LOCAL STRUCTURE PLAN

The following outlines the contents of the Local Structure Plan (Refer **Plan 10** – "Wellard West" Local Structure Plan).

7.1 DESIGN RATIONALE

The Local Structure Plan (LSP) has been designed based on the principles of 'Liveable Neighbourhoods' and seeks to create a sustainable and functional community. All aspects of the design have been carefully considered to ensure the environmental assets of the subject area are preserved and future development is sustainable.

7.1.1 Vehicular Access

Access into the LSP Area will be via Mortimer/Bertram Road and Wellard Road onto Johnson Road. It is proposed to realign Johnson Road at its southern extremity to provide a link to Wellard Road rather than dissecting the LSP Area and linking to Millar Road. Johnson Road will therefore form a boundary between urban development in the LSP Area to the south-east and rural residential development to the north and west. The re-alignment of Johnson Road will also improve accessibility to the southern portion of the LSP Area.

Three (3) access points are provided from the west of the LSP area via Johnson Road. The first is situated slightly north of where Tamblyn Place meets Johnson Road. This access point services the northern portion of the LSP Area and creates a vista as it is located centrally to the Public Open Space to the east.

The second entry point is located south of the Jacobs Place Road Reserve and is the main entry to the LSP area. The design intent has been to create a "boulevard" with separate ingress and egress points that are divided by a landscaped median strip that evolves into a larger portion of Public Open Space. Consequently a more generous road reserve width has been afforded to this location to facilitate an enhanced streetscape aesthetic. It is around this entry point that the first stage of development is proposed to occur.

The third entry point is located immediately north of the proposed primary school and this access point services the southern portion of the LSP Area. No other vehicular ingress/egress points to the residential estate are proposed as part the LSP.

7.2 RESIDENTIAL DENSITY

The LSP provides for the development of individual residential lots with a further three group dwelling sites provided. While the majority of the LSP Area will be developed with R20 lots, varying lot sizes ensure a wide range of housing stock may be established that will effectively accommodate the future population needs of the area.

Accordingly, a higher density of R40 lots with rear laneway access have been located around Public Open Space (POS) areas and R25 lots have been positioned in close proximity to POS. The proposed residential density mixture is consistent with the principles in 'Liveable Neighbourhoods' and 'Network City'.

7.3 PUBLIC OPEN SPACE

Public Open Space (POS) has been provided in accordance with Western Australian Planning Commission (WAPC) and Town of Kwinana provisions requiring a minimum area of 10%, with all residential development being within walking distance (400 metres) of a POS area. Table 4 outlines the amount of POS provided in relation to the area of the LSP.

Table 4: Public Open Space Schedule

PUBLIC OPEN SPACE SCHEDULE				
SITE AREA				
Cedar Woods Properties Land			47.61	Ha
MRWA Land (to be acquired by CWP)			1.2987	Ha
Other Private Landholdings			12.2900	Ha
Lot 21 - Existing Drainage Reserve abutting Freeway			0.1218	Ha
Lateral Drainage Reserve (across POS 4)			0.3440	Ha
		Total Site Area	**61.6647**	**Ha**
Deductions				
Primary School		3.5000		
Commercial Site		0.1824		
Lots 8001 and 8002 Johnson Road - Landscaped Drainage Basins		0.3113		
Lot 21 - Existing Drainage Reserve abutting Freeway		0.1218		
Sewer Pump Station		0.0927		
Lateral Drainage Reserve (across POS 4)		0.3440		
Drainage Swale – 1a		0.0839		
Drainage Swale - 2		0.0513		
Drainage Swale - 3		0.1808		
Drainage Swale - 4		0.1910		
	Total Area of Deductions	**5.0592**	**Ha**	
		Gross Subdividable Area	**56.6055**	**Ha**
		10% POS	**5.6606**	**Ha**
Unrestricted POS (8% minimum)				
1(a) POS		1.0085		
1(b) POS		0.0833		
2 POS (Lot 8003 - Reserve for Recreation)		0.6421		
3 POS		0.3038		
4 POS		2.5712		
Community Pavilion		0.1092		
	Total Unrestricted POS =	**8.34%**	**4.7181**	**Ha**
Restricted Use POS (2% maximum)				
1(a) POS		0.2521		
2 POS (Lot 8003 - Reserve for Recreation)		0.1605		
3 POS		0.1184		
4 POS		0.5939		
	Total Restricted POS =	**1.99%**	**1.1249**	**Ha**
				Ha
Lateral Drainage Reserve (POS) not included in above calculations		**0.3440**	**Ha**	
		Therefore Overall POS in LSP	**6.1870**	**Ha**

The POS areas are evenly distributed throughout the LSP Area and will provide the opportunity for passive recreation by future residents by maximizing the retention of high quality remnant vegetation.

The POS has been designed having regard to topography, existing vegetation, drainage considerations and the recommendations of the Tree Survey Report. As a consequence, the POS performs several functions including improving the aesthetic integrity of the area and retaining the highest quality remnant vegetation.

As identified in the Tree Survey Report, the southern portion of the LSP Area contains two large groupings of remnant vegetation worthy of retention, with the eastern grouping having the greatest environmental value in relation to amenity and compatibility with residential development. Accordingly, this area has been captured within the POS proposed for the LSP Area. Similarly, the northern portion of POS has been located to maximise retention of the high quality remnant vegetation. All POS areas have been designed and shaped to retain as many mature trees as possible due to the habitat, hydrological, aesthetic, social and economic value.

All the R40 lots directly abutting the POS areas are provided with rear laneways for vehicle access and this design feature has two significant advantages. The first is that it facilitates passive surveillance of the POS thereby creating a safer public environment and secondly, it promotes a higher level of aesthetic quality at the interface of the POS and the residential areas. That is to say that the POS will be bordered by the fronts of dwellings with visually permeable infill panel fencing as opposed to solid rear fencing.

In order to facilitate visitor access to these lots, a footpath is provided adjacent to all lot boundaries that directly abut POS areas. Furthermore, embayed car parking areas will be provided within the verges of all POS within the LSP Area. These car parking bays will promote the use of the POS areas and facilitate visitor car parking for those lots that do not have direct frontage to a gazetted road.

7.3.1 District Sporting Facilities

A district sporting facility has been situated in the southern portion of the LSP area. As a result of discussions with the Town of Kwinana, the LSP makes provision for a senior sized football oval. The dimensions of the playing surface are 200m in length (from goal post to goal post) and 140m in width. In addition, a 15m wide buffer is provided around the perimeter of the playing field. It should be noted that this buffer exceeds the 10m requested by the Town of Kwinana.

A small portion of the senior oval has been located within the 3.5ha area of land set aside for the primary school. This design configuration has been endorsed by the Department of Education.

7.3.2 Public Open Space Infrastructure

The POS within the LSP Area will be appropriately landscaped and master plan designs will be prepared after consultation with the Town of Kwinana to determine appropriate levels of infrastructure including playground equipment and barbeque facilities.

7.3.3 Public Open Space Abutting Johnson Road

Due to the topography of the site it was necessary to locate a small portion of POS in the vicinity of Entry 2 to the LSP Area to facilitate overall drainage requirements. Two (2) smaller portions of POS with direct frontage to Johnson Road are located to the north and south of this entry. However, these portions of POS are utilised exclusively for drainage purposes and do not achieve any POS credit. Notwithstanding, the design intent has been to create a symmetrical landscape feature where the primary vehicular ingress and egress to the estate occurs. These areas also present opportunities for the future installation of public art.

7.3.4 Central Drainage Swales

A feature of the 'Wellard West' LSP design is the central drainage swales that connect the northern most portion of POS with the drainage basin located in the southern portion of POS. In addition to their drainage function, the central swales serve to add visual interest to the centrally located road reserve of the LSP and promote a more pedestrian friendly environment.

7.3.5 Verge Trees

Appropriate native and indigenous verge trees will be provided along all local roads proposed within the LSP area. The choice of species will be made in conjunction with advice provided by the Town of Kwinana.

7.4 ENVIRONMENTAL CONSIDERATIONS

There are no known environmental constraints inhibiting the development of the LSP area. The subject site has been extensively cleared in the past and as previously mentioned is zoned 'Rural A' with an Amendment initiated to rezone the LSP area to 'Urban Deferred' under the provisions of the Town of Kwinana Town Planning Scheme No. 2.

There are however, a number of land uses and other activities located within relatively close proximity of the subject land which from time to time, may create elevated noise levels and have the potential to impact on future residents. A Noise Impact Assessment has been prepared by Lloyd George Acoustics on behalf of Cedar Woods and was previously submitted to the Town. Any measures required to mitigate the impact associated with noise will be addressed through the imposition of appropriate conditions of subdivision/development. This may include notifications being placed on the certificate of title of affected new lots.

7.5 TRAFFIC MANAGEMENT

The local road network within the LSP area has been configured to provide permeability, connectivity and legibility in accordance with Liveable Neighbourhoods principles, as well as having regard to the topography of the subject area. Generally the land grades such that it is preferable to orient the roads running up and down the contours to reduce site disturbance, reduce the need for extensive retaining walls and enhance the visual amenity of the streetscape.

Road lengths have generally been restricted to a maximum of 300 metres to allow on-street parking that will serve as a 'defacto' traffic calming method. Where it has not been possible to restrict the length to less than 300 metres along the section of road servicing lots abutting the Freeway, elevated sections of road reserve with changes in surface treatment have been positioned at three points in an effort to slow vehicle speeds.

A wider reserve is proposed for the central north/south roads to provide for an enhanced streetscape and pedestrian environment as well as to incorporate vegetated drainage swales that link the public open space areas. Parallel roads provide for additional vehicle connectivity thereby reducing the traffic volumes on the central roads and creating streetscapes that are more sympathetic to the needs of pedestrians and residents. The road system is able to accommodate a bus service if required.

7.6 PRIMARY SCHOOL

The LSP indicates the location for a future primary school in the southwest corner of the LSP area. The Jandakot Structure Plan (JSP) also depicts a primary school in this general location but to the west of Johnson Road.

Despite the recommendations of the JSP, the Town of Kwinana has previously expressed concerns that urban development west of Johnson Road may not eventuate and, following consultation with the Department of Education (DoE), the primary school site was shown entirely over Cedar Woods' landholdings. Development of the primary school will not be undertaken for some time and should the realignment of Johnson Road as per the LSP proceed, an opportunity will exist to further modify the LSP to locate a portion of the Primary School site over the existing Johnson Road reserve.

7.7 COMMERCIAL ZONE

The LSP makes provision for a local centre which is zoned 'Commercial'. The site is located on the northern side of the southern-most entry to the LSP.

The local centre's primary objective is to establish a focal destination for the LSP area. It is intended to offer a small convenience store between 100-200m^2 Gross Leaseable Area.

Prior to any development of the site the built form will need to be determined through the preparation and lodgement of a Detailed Area Plan (DAP). This will include the following attributes:

i. Street based, with a reduced setback to the primary street boundary;
ii. Incorporate on-street car parking where practical, as well as off-street parking;
iii. Verge areas between kerb lines and building fronts treated as a hard paved side walk, including street furniture;
iv. Sidewalk areas afforded weather protection by awnings;
v. Buildings at nodes architecturally contributing to the street, and providing an active edge.

7.8 COMMUNITY PAVILION

In accordance with the advice provided by the Town of Kwinana, a site for Community Pavilion has been located in the south western corner of the LSP directly adjacent to POS Area 4 and will ultimately be developed and integrated as part of the Public Open Space.

The Town of Kwinana has recently initiated a Town Planning Scheme Amendment in relation to developer contributions for common services and community infrastructure as a basis for equitably sharing the cost of various works and services in the Town. The subject Community Pavilion is currently included as one of the items that all subdividing land owners within the Structure Plan area shall contribute towards.

8. SERVICING

In undertaking investigations on servicing availability, discussions were held with all the major servicing authorities as well as the Town of Kwinana.

8.1 SEWERAGE

The Water Corporation has indicated that a sewer pump station and pressure main are required to service the area. It is proposed to locate a Type 10 station in the southern extremities of the area, adjacent to Johnson Road. The pumping station will require prefunding to be negotiated with the Water Corporation at the time of development. The pressure main is proposed to run north along Johnson Road and discharge into a proposed sewer within Tamblyn Place, which ultimately gravitates to the existing Kwinana pump station. The discharge point will be reviewed based on infrastructure in the ground at the time of the development.

8.2 WATER

The Water Corporation has advised that the LSP Area is serviceable from the current Medina Gravity Scheme but will require the expansion of distribution mains. The timing and prefunding requirements of the mains will need to be negotiated with the Water Corporation once the development rates are known. The developer to the north of Mortimer Road will extend a 300mm diameter water main to the southern boundary of the development area, which is Mortimer Road. Cedar Woods will then prefund the construction of the 300mm diameter main southwards for a distance of approximately 300m after which it becomes a reticulation main and is no longer prefunded.

The prefunding period will be based on a performance area and this is foreseen as the LSP area. The Water Corporation are to be kept informed of the intended staging of developments in the locality in order to construct the 500mm and 375mm diameter mains planned for the area. If the speed of development exceeds the Water Corporations infrastructure programme the mains will need to be prefunded within a fixed period of time.

8.3 POWER

Proposed urban development of the area will initially have reasonable access to power supplies off existing facilities, however, ultimate development of the area will require upgrading of this system by Western Power.

Ultimate development of the area will also require the installation of a number of new transformers as part of the new underground power supply to the proposed residential lots and Cedar Woods Wellard Ltd. have given an undertaking to contribute to the costs of providing underground power to the LSP Area.

8.4 TELECOMMUNICATIONS

Telstra has advised that telephone infrastructure already exists along Mortimer Road both east and west of the Freeway. This infrastructure has sufficient capacity to support developments south of Mortimer Road.

8.5 ALINTA GAS

Natural gas is available to the residential developments at Bertram to the northwest. Alinta Gas has advised that any extension of gas mains will attract headworks charges, the scale of which is dependent on the location of the connections to the subdivision.

8.6 DRAINAGE

8.6.1 Overview

The subject land falls within the Water Corporation's Mundijong Drainage District, however, this is only intended to serve the land in its current rural form. Current modelling undertaken by the Corporation has established the current drainage lines are only adequate to accommodate drainage flows for low duration rainfall events of 1 in 6 months without breaking existing banks. These minor surface drains are not located within the LSP Area, but run adjacent to the southern border for a short distance before discharging to the Peel Man Drain. Surface discharges from the LSP Area will only discharge to the lower portion of these minor drains immediately before discharge to the Peel Main Drain, and the capacity of these minor drains is therefore not seen as an impediment to the adequate disposal of runoff from the LSP Area.

8.6.2 Local Water Management Strategy

Cardno BSD are working collaboratively with the Water Corporation, Department of Water and Town of Kwinana to develop a Local Water Management Strategy (LWMS) for 'Wellard West' and to assist with the broader investigations required to develop the regional Water Resource Management Strategy (WRMS) for the Jandakot Structure Plan (JSP) area. This has included undertaking baseline monitoring to determine existing hydrological conditions. The results of these studies are key inputs for preparation of the LWMS and subsequently in finalising the LSP.

To ensure that post-development discharges from the LSP Area are consistent with pre-development levels, it is necessary to undertake further analysis of drainage requirements for the LSP Area. It is proposed that this would be undertaken at the Urban Water Management Plan (UWMP) stage.

The proposed system will adopt water sensitive design philosophies in the final built form of urbanisation. This will include infiltration at source through the use of soakwells within lot boundaries and infrastructure within the piped drainage network that encourages localised infiltration, with overflows piped to swales (or infiltration basins) located at low points within Public Open Space (POS) areas. Further flood protection will be provided via overflow spillways or through a compensated outlet to the Peel Main Drain.

The core of the infiltration basins will be vegetated in order to provide treatment of the first flush events, and for flows up to the one (1) year ARI event, which usually carry the highest pollutant loads. The swales incorporated into the LSP will also facilitate soakage to assist in maintenance of the groundwater regime. Additionally, the swales will be provided with vegetation to assist in nutrient removal. The core of the infiltration basins will have sufficient volume to provide detention time to improve water quality by sedimentation of solids, while the surrounding POS will be sized to satisfy flood mitigation requirements to prevent the overloading of the downstream drainage system. Overflows from the swales and infiltration basins to the existing open drain system will be via a reinforced overflow weir structure to prevent scouring.

In the lower lying, southern part of the LSP Area, it is anticipated that earthworks will be necessary to provide both acceptable and workable clearance to the AAMGL. In order to achieve this objective, the preferred strategy will be to utilise fill from higher areas to maintain adequate separation from the underlying groundwater. The final balance of these requirements will be determined at the time of detailed design having regard to the WRMS prepared for the JSP area and the LWMS prepared for the Cedar Woods landholdings.

It is proposed to compensate the surface runoff to pre-development levels, and the Water Corporation has previously advised that drainage headworks will not apply for development in the Mundijong Drainage District.

The site has been divided into catchments based on the proposed earthworks plan, with the guiding principle of avoiding import of additional fill, maintaining adequate surface-groundwater separation and thereby subsequently restricting earthworks to a minimum.

Cardno BSD and Cedar Woods Wellard Ltd. are continuing to work with both the DoW and Water Corporation to develop a LWMS that adopts best management practices for drainage disposal.

9. CONCLUSION

The LSP is consistent with the zoning under the MRS and the recently gazetted Scheme Amendment No. 91 to the Town of Kwinana Town Planning Scheme No. 2 that rezoned the LSP Area from 'Rural A' to 'Residential' and satisfies the next stage in the planning process.

The LSP provides a lot, road and Public Open Space design that is consistent with the principles of 'Liveable Neighbourhoods', 'Network City' and the Town of Kwinana Town Planning Scheme. The LSP allows for the development of a co-ordinated and integrated residential estate and road connections onto the existing road network have been supported in recent discussions with officers from the Town of Kwinana.

The plan is also supported by the Local Water Management Strategy (LWMS) that demonstrates how the proposed drainage will be incorporated into the Public Open Space areas and is an integral consideration in the design.

The LSP Area has no environmental constraints such as wetlands, Bush Forever or any sites of heritage significance (European or Indigenous) that require action to be undertaken.

In summary, the LSP provides an appropriate planning framework for the future subdivision and development of 'Wellard West', and support of the plan is sought accordingly.

APPENDIX A

PAIRWISE COMPARISON MATRIX – WELLARD WEST

TABLE 1

	Sustainable Communities Objectives	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Q	Weighting
A	Optimise intensity and mix of development Optimise density and landuse mix to facilitate efficient use of land, infrastructure and resources		A2	A2	A2	AE	A3	A3	A2	A3	A3	K2	L2	A2	A2	AO	26
B	Connectivity Provide for efficient personal and commercial transport connections to local and regional destinations			BC	BD	E2	B3	BG	H2	B2	J2	K2	L2	M2	B2	O2	10
C	Walking and Cycling Promote walking and cycling as an alternative to motorised transport and as a recreational pursuit				C2	CE	C2	CG	CH	C2	CJ	CK	CL	CM	C2	CO	17
D	Fostering Landuse and Transport integration with a focus on Transit Oriented Development Optimise use of public transport and non-motorised transport to reduce car dependency					E3	DF	G2	H2	DI	J2	K2	L2	M2	DN	O2	4
E	Housing Diversity Promote accessibility, adaptability and affordability in housing choice to match the changing needs of Perth's population						E3	E2	E2	E3	E2	EK	E2	EM	EN	EO	25
F	Heritage Provide for the conservation and interpretation of Aboriginal and European heritage.							G3	H2	FI	J2	K3	L3	M3	N3	O3	2
G	Infrastructure Coordination Promote cost efficient provision of infrastructure and services for the benefit future residents and businesses and for betterment of the broader community								GH	G2	GJ	K2	L2	GM	GN	GO	14
H	Interface Management Minimise any adverse impact to and from potentially conflicting landuse and infrastructure									H3	H2	K2	L2	HM	HN	HO	16
I	Employment Enhance the catchment and economic base of existing activity and employment centres and promote the creation of new local employment opportunities										J2	K3	L3	M3	N2	O3	2
J	Environmental Enhancement Actively seek to remediate, protect and enhance areas of environmental significance and protect biodiversity											K2	L2	M2	JN	JO	12
K	Green Estates and Buildings Provide for resource efficient, comfortable and healthy buildings through energy efficient lot configuration and building controls												KL	KM	K2	KO	25
L	Urban Water Management Manage the total water cycle in a manner that promotes efficiency and preserves ecosystem health													LM	L2	L2	25
M	Public Open Space Provide 10% open space, preserve biodiversity, promote healthy lifestyles, maximise use by integration with activity nodes and optimise local density														M3	MO	22
N	Building Community and Place Activation Provide facilities, services and initiatives which stimulate community development, business and community interaction and sense of place															NO	11
O	Sense of Place Create local identity and pride which people associate with.																19

	Sustainable Community Objectives	Weighting	Existing Score		Predicted Score Subject to Recommendations	
1	Optimise intensity and mix of development Optimise density and landuse mix to facilitate efficient use of land, infrastructure and resources.	26	3	78	4	104
2	Housing Diversity Promote accessibility, adaptability and affordability in housing choice to match the changing needs of Perth's population.	25	3	75	4	100
2	Green Estates and Buildings Provide for resource efficient, comfortable and healthy buildings through energy efficient lot configuration and building controls.	25	4	100	4	100
2	Urban Water Management Manage the total water cycle in a manner that promotes efficiency and preserves ecosystem health.	25	3	75	4	100
3	Public Open Space Provide 10% open space, preserve biodiversity, promote healthy lifestyles, maximise use by integration with activity nodes and optimise local density.	22	3	66	4	88
4	Sense of Place Create local identity and pride which people associate with.	19	2	38	3.5	66.5
5	Walking and Cycling Promote walking and cycling as an alternative to motorised transport and as a recreational pursuit.	17	4	68	4.2	71.4
6	Interface Management Minimise any adverse impact to and from potentially conflicting landuse and infrastructure	16	4	64	4	64
7	Infrastructure Coordination Promote cost efficient provision of infrastructure and services for the benefit future residents and businesses and for betterment of the broader community.	14	4	56	4	56
8	Environmental Enhancement Actively seek to remediate, protect and enhance areas of environmental significance and protect biodiversity.	12	3.5	42	4	48
9	Building Community and Place Activation Provide facilities, services and initiatives which stimulate community development, business and community interaction and sense of	11	2	22	4	44
10	Connectivity Provide for efficient personal and commercial transport connections to local and regional destinations.	10	2	20	3	60
11	Fostering Landuse and Transport integration with a focus on Transit Oriented Development Optimise use of public transport and non-motorised transport to reduce car	4	NA		NA	
12	Heritage Provide for the conservation and interpretation of Aboriginal and European heritage.	2	NA		NA	
12	Employment Enhance the catchment and economic base of existing activity and employment centres and promote the creation of new local employment opportunities.	2	NA		NA	

TOTAL	660 (59.5%)	901.9 (81%)

1 = Poor

2 = Adequate

3 = Good

4 = Very Good

5 = Excellent

	Sustainable Community Objectives	Recommendations
1	Optimise intensity and mix of development Optimise density and landuse mix to facilitate efficient use of land, infrastructure and resources.	• There is need to improve the efficiency of the design where possible • Investigate reduction of width of roads adjacent and parallel to Johnson Road (convert to cap roads) • Consolidate triangular land parcel adjacent to primary school site (remove road divide) and provide for R40 group dwellings/aged persons site • Provide for display village on both sides of Entry 2 • Investigate potential to credit central road swales as POS credit (long slender parks to be a feature in the estate • Ensure all proposed POS obtains 100% credit (linear parks along entry roads) • Delete swale along Entry 1 (questionable drainage function) • Investigate reductions in extent of road provision • Provide R40 at street ends
2	Housing Diversity Promote accessibility, adaptability and affordability in housing choice to match the changing needs of Perth's population.	
2	Green Estates and Buildings Provide for resource efficient, comfortable and healthy buildings through energy efficient lot configuration and building controls.	• Lot orientation considered Very Good • Provide better purchaser education on the benefits of good solar design (requirement on display village builders) • Provide for solar setbacks in design guidelines (east facing cottage lots) • Require Greensmart compliance or beyond • Look at rainwater tank give-aways and consider the use of shared bores • Liaise with DET regarding the ESD in primary school design (as done in Harvest Lakes) • Carry out market research on potential client attitudes / understanding of sustainable building design and on preferences for lot size and built form
2	Urban Water Management Manage the total water cycle in a manner that promotes efficiency and preserves ecosystem health.	• Build on draft Local Water Management Strategy already undertaken by BSD/Cardno • Ensure Local Water Strategy picks up total water cycle management • Adopt Waterwise principles and water sensitive urban design • Obtain early groundwater licence approvals for proposed POS reserves • Confirm landscaping opportunities for central road swales – ensure high landscaping aesthetics can be achieved • Overflow to regional drain at the southern end of the site provides opportunity for rehabilitation (living stream) – investigation to include discussions with Dept of Water
3	Public Open Space Provide 10% open space, preserve biodiversity, promote healthy lifestyles, maximise use by integration with activity nodes and optimise local density.	• Need to undertake a tree survey to maximise retention of existing vegetation , taking into account bulk earth works plan • Seek retention of existing topography, where feasible • Investigate Local Government acceptance of POS layout (central swales and narrow strips at entry roads) and seek POS credit for central road swales – on visual amenity grounds

4	Sense of Place Create local identity and pride which people associate with.	• Historic association with Mortimer family and horses • Strengthen green link (central swales forming a dominant landscape feature linking with adjacent wetland • Potential estate name – Mortimer Rise at risk with bulk earth works plan • Need to look at the broader context of the site to establish local identity • Numerous identities could be established withn the estate, to add to diversity and interest
5	Walking and Cycling Promote walking and cycling as an alternative to motorised transport and as a recreational pursuit.	• Need to better understand regional path network • Investigate opportunity for northern link with Freeway dual use path, having regard to grade differences
6	Interface Management Minimise any adverse impact to and from potentially conflicting landuse and infrastructure	• Maintain minimalisation of screen walls along the Johnson road boundary • Comply with conditional noise amelioration requirements associated with the Freeway
7	Infrastructure Coordination Promote cost efficient provision of infrastructure and services for the benefit future residents and businesses and for betterment of the broader community.	• Need to incorporate regional drainage and realign regional drainage line at the southern end of the project site
8	Environmental Enhancement Actively seek to remediate, protect and enhance areas of environmental significance and protect biodiversity.	• Potential for environmental offset in rehabilitation of southern regional drainage lines (living stream) • Structure plan report to document rehabilitation of former piggery and water quality monitoring • Drainage and water quality addressed as part of Local Drainage Strategy • Tree Survey to maximise retention of existing vegetation
9	Building Community and Place Activation Provide facilities, services and initiatives which stimulate community development, business and community interaction and sense of place.	• Primary school and Mixed Use sites form principal activity node within the estate. Place Activation Strategies occur outside of Masterplan process
10	Connectivity Provide for efficient personal and commercial transport connections to local and regional destinations.	• Entry roads and central spine road provide good east – west movement • Requirement for no east-west connectivity through the site due to Freeway
11	Fostering Landuse and Transport integration with a focus on Transit Oriented Development Optimise use of public transport and non-motorised transport to reduce car dependency.	• Likely bus route along Johnson Road • Realignment of Johnson Road to connect to Wellard train station
12	Heritage Provide for the conservation and interpretation of Aboriginal and European heritage.	• Possibility to highlight historic links with the Mortimer family and horse racing with the Sense of Place objective
12	Employment Enhance the catchment and economic base of existing activity and employment centres and promote the creation of new local employment opportunities.	• Employment generation is limited to the Mixed Use site and primary school • Future population will add to the catchment of existing and planned centres and will add to the vibrancy of the Kwinana Town Centre