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Lot 1665 Wanneroo Road, Sinagra (EPBC 2017/7921)

Construction Environmental Management Plan

Prepared for
Stockland Development Pty Ltd (ABN 16 000 097 825)
by Strategen

June 2019

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ENVIRONMENTAL

Lot 1665 Wanneroo Road, Sinagra (EPBC 2017/7921)

Construction Environmental Management Plan

Strategen is a trading name of
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June 2019

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Client: Stockland Development Pty Ltd (ABN 16 000 097 825)

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Draft Report	A	Client review	L Stevens / K Cooper / M Stone / D Newsome	Electronic	16-8-18
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Final Report	D	Incorporate DEE comments (dated 03/06/2019)	W Oversby / D Newsome	Electronic	05-06-19

Filename: STO18073.01_01 R004 Rev D - 5 June 2019

Declaration of accuracy

I declare that:

1. To the best of my knowledge, all the information contained in, or accompanying Vegetation and Conservation Area Management Plan (Rev 1) is complete, current and correct.

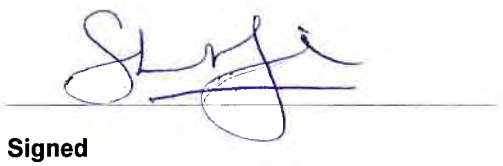
2. I am duly authorised to sign this declaration on behalf of the approval holder.

3. I am aware that:

a. Section 490 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.

b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) where the person knows the information or document is false or misleading.

c. The above offences are punishable on conviction by imprisonment, a fine or both.



Signed

STUART SINCLAIR

Full name (please print)

STOCKLAND DEVELOPMENT PTY LTD

Organisation (please print)

Executive Summary

Stockland Development Pty Ltd (Stockland) proposes to develop Lot 1665, Wanneroo Rd, Sinagra.

The Department of the Environment and Energy (DEE) have requested that a Construction Environmental Management Plan (CEMP) is prepared prior to EPBC approval and subsequent conditions being set. The purpose of this document therefore is to inform EPBC approval. This CEMP aims to:

- provide measures to avoid and mitigate impact to Carnaby's Black-Cockatoo (CBC) and Forest Red-tailed Black Cockatoo (FRTBC) and their habitat, within the Project Area, prior to, during and post construction
- provide measures to avoid and mitigate indirect impacts to Banksia Woodland TEC adjacent to the Project Area
- identify objectives, interim targets, performance indicators and completion criteria
- provide timeframes for the implementation and completion of the above objectives
- develop a monitoring and reporting program
- identify contingency measures
- establish roles and responsibilities.

The Project Area contains approximately 14.5 ha of potential foraging habitat for the Endangered CBC and Vulnerable FRTBC, which will be cleared for the sites re-development. A total of 264 Black Cockatoo potential breeding trees (>500mm diameter at breast height [DBH]) have been identified within the Project Area. None of the trees had suitable Black Cockatoo breeding hollows. A 'significant' tree retention viability assessment will be undertaken to determine whether any of the potential breeding trees can be retained within the development area (i.e. in Public Open Space [POS] and road reserves) once engineering specifications (i.e. cut and fill, installation of infrastructure) have been determined for the Project Area. The POS areas are currently undefined but will comprise up to 4 ha (10%) of the Project Area and will provide areas for active and passive open space as well as drainage management.

Vegetation adjacent to the site to the south and contained within a separate landholding and under different ownership to the proposed action is analogous to the Banksia Woodlands of the Swan Coastal Plain TEC. Vegetation within the proposal area is separated from vegetation within the adjacent site by a firebreak approximately 10 m wide and a tall fence, and there is limited hydrological connectivity.

An assessment of the potential impacts and risks to CBC and FRTBC within the Project Area, and Banksia Woodland TEC adjacent to the Project Area, because of the Project has been undertaken. Results of the risk assessment have been used to develop management measures that form part of this CEMP, including:

- identification and delineation of clearing and retention areas
- identification of trees for retention
- Black Cockatoo management
- weed and pathogen management
- hydrological management.

Monitoring activities will be undertaken to determine performance against objectives. Contingency measures will be initiated if monitoring indicates that targets and performance indicators are not being met.

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1. Introduction

Stockland Development Pty Ltd (Stockland) proposes to develop Lot 1665 Wanneroo Road, Sinagra for residential development.

The proposed action was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to the Department of Environment and Energy [DEE]) by Inghams Group Limited (Inghams) in May 2017 (Appendix 1). The proposed action was determined to be a controlled action requiring assessment via preliminary documentation on 28 June 2017. Following a change in land ownership, a request to change the proponent from Inghams Group Limited to Stockland Development Pty Ltd was requested and a Notice of change of proponent for the proposed action was issued on 19 March 2018.

On 31 July 2017, DEE requested further information to enable assessment through preliminary documentation. Specifically, information requested related to the Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (Banksia Woodland TEC), Carnaby's Black Cockatoo (CBC) (*Calyptorhynchus latirostris*) and Forest Red Tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii naso*).

Strategen Environmental (Strategen) provided the additional information requested by DEE on 24 May 2018. The DEE subsequently requested a Construction Environmental Management Plan (CEMP). The purpose of this CEMP is to satisfy the requirement by the DEE to provide a CEMP prior to EPBC approval and subsequent conditions being set.

1.1 Project description

Lot 1665 Wanneroo Road, Sinagra (the Project Area) comprises an area of 40 ha and is located approximately 23 km north of Perth CBD (Figure 1). The proposed action involves works pertaining to the provision of residential housing, public amenities and transport routes.

The proposal area is in the East Wanneroo Cell 2 Structure Plan area (Appendix 2). The proposal area is zoned Urban Deferred under the Metropolitan Region Scheme (MRS) and Urban development under the City of Wanneroo Local Planning Scheme 2. The Urban Deferred status under the MRS is related to the Ingham Poultry operations on site, and the relocation of this facility is required to enable development of the Project Area.

The Project Area contains approximately 14.5 ha of potential foraging habitat for CBC (listed as Endangered under the EPBC Act) and FRTBC (listed as Vulnerable under the EPBC Act), which will be cleared for the development. A total of 264 potential breeding trees (>500mm diameter at breast height [DBH]) have been identified within the Project Area. The design phase of the development is not complete; however, the proposed development will aim to include the retention of Black Cockatoo habitat on site, with a focus on retention of potential breeding trees. It is anticipated that potential breeding trees may be able to be retained within Public Open Space (POS), however the ability for tree retention on the site is compromised by the site's topography and the associated amount of earthwork that is required to enable development. None of the trees within the Project Area contain potentially suitable hollows for Black Cockatoo breeding. It should be noted that it is assumed that 14.5 ha of Black Cockatoo habitat, comprising 264 trees, will be cleared as part of the proposed action.

Banksia woodlands within the proposal area were assessed against the diagnostic criteria for the commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC (Banksia Woodland TEC). Based on the vegetation being in less than Good condition, the vegetation within the proposal area was considered to be too disturbed to meet the diagnostic criteria for the TEC.

The larger intact area bordering the south-east boundary of the proposal area comprises approximately 30 ha of remnant bushland (the adjacent site, Lot 9000 Wanneroo Road; Figure 1). The vegetation within the adjacent site was assessed at the request of DEE, and is analogous to the Banksia Woodland TEC. It should be noted for clarity, that the adjacent site is under separate ownership to the proposal area and is not related to the proposed development within the Project Area. For this reason, management of indirect impacts to the adjacent Banksia Woodland TEC focus on the prevention of spread of weeds and dieback into the adjacent Banksia Woodland TEC, and rubbish and hydrological management.

1.2 Purpose

This CEMP aims to:

- provide measures to avoid and mitigate impact to Carnaby's Black-Cockatoo (CBC) and Forest Red-tailed Black Cockatoo (FRTBC) and their habitat within the Project Area, prior to, during and post construction
- provide measures to avoid and mitigate impact to Banksia Woodland TEC adjacent to the Project Area
- identify objectives, interim targets, performance indicators and completion criteria
- provide timeframes for the implementation and completion of the above objectives
- develop a monitoring and reporting program
- identify contingency measures
- establish roles and responsibilities.

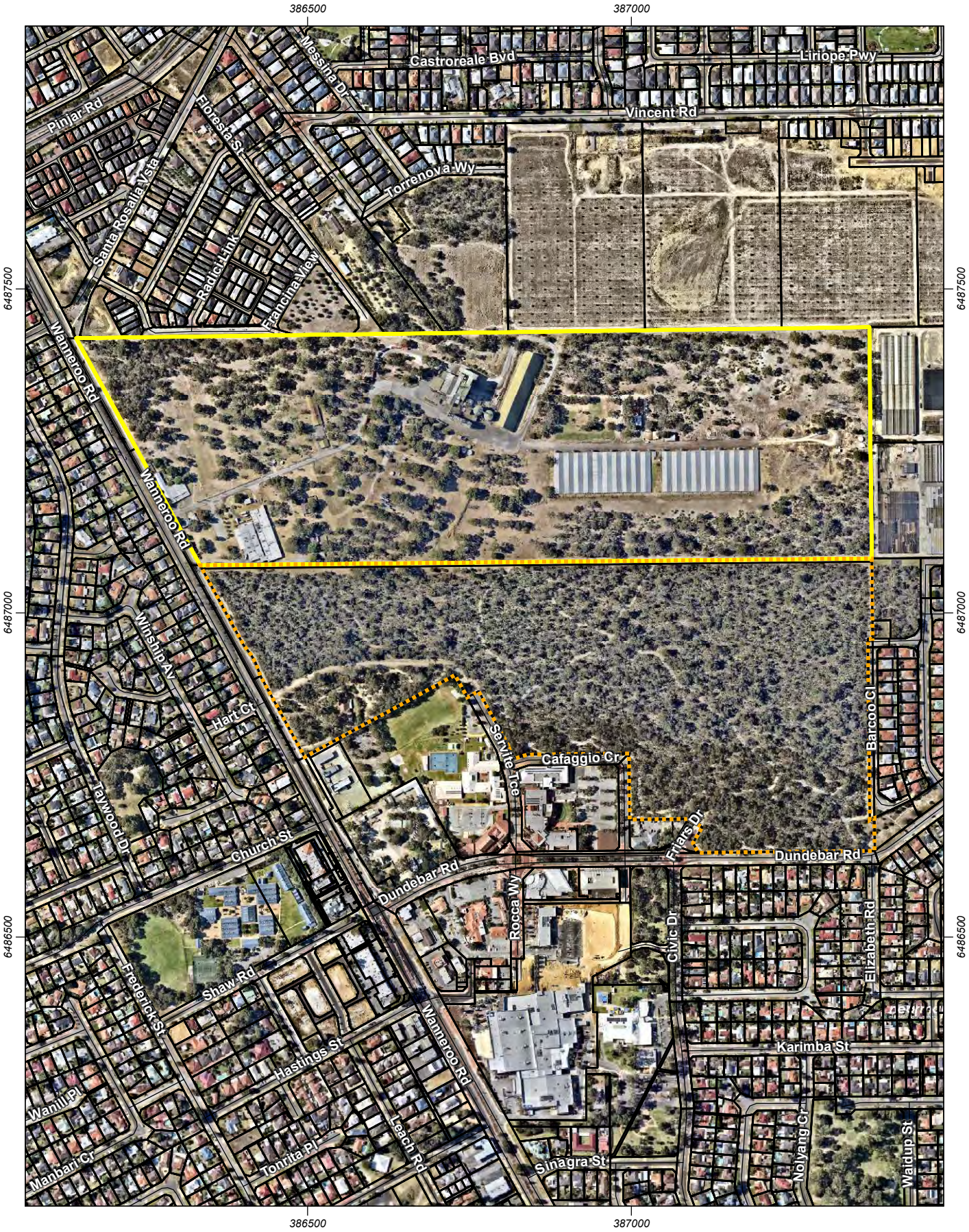

Figure 1: Project Area and adjacent site

Scale 1:8,000 at A4

0 50 100 150 200 250 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 15/08/2018
Author: CThatcher
Source: Aerial image: Nearmap, flown 02/2018.

Legend

- Adjacent site
- Proposed development area
- Existing cadastre

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1.3 Statutory and policy context

1.3.1 Environment Protection and Biodiversity Conservation Act 1999

An EPBC Act referral for the Project was submitted to DEE in May 2017. The Project was determined to be a controlled action (EPBC 2017/7921), requiring assessment via preliminary documentation on 28 June 2017. DEE have requested that a CEMP be provided prior to EPBC approval and subsequent conditions being set. The purpose of this document therefore is to inform EPBC approval.

1.3.2 Metropolitan Region Scheme and Local Structure Plan

The site is zoned 'Urban Deferred' in the Metropolitan Region Scheme (MRS) and 'Urban Development' in the City of Wanneroo's District Planning Scheme No. 2. Following relocation of the poultry farm on site, planning will be undertaken to lift the Urban Deferred zoning of the Proposal Area to facilitate the commencement of residential development.

Lot 1665 Wanneroo Road, Sinagra, is proposed to be developed for residential housing. The site is within East Wanneroo Cell 2 (Sinagra) – Approved Local Structure Plan 4 (Appendix 2).

1.3.3 Public consultation

Consultation with the City of Wanneroo (CoW) has occurred through the planning process regarding the sites re-development. There is ongoing liaison between the proponent and the CoW in relation to the Project Area.

1.3.4 City of Wanneroo Local Planning Policy

Local Planning Policy 4.3 Public Open Space

The CoW Local Planning Policy (LLP) 4.3 aims to ensure that new POS areas provide a balance of the following:

- a diversity of recreational uses and options for the community
- nature spaces protecting local natural assets whilst providing the community with managed access
- incorporation of water sensitive urban design principles
- high levels of amenity
- affordability (including consideration of future maintenance costs)
- environmental sustainability
- sports sites for organised sporting activities.

The LLP discusses a minimum of three percent (3%) of the gross sub-divisible area shall be provided as POS for the purposes of conservation and recreation where any of the following significant natural assets exist:

- Threatened and Priority Ecological Communities
- Declared Rare and Priority Flora Species
- Specially Protected and Priority Fauna Species; Matters of National Environmental Significance (as per EPBC Act 1999)
- wetlands
- karstic features e.g. caves and pinnacles
- vegetation complexes with less than 30% of their original extent remaining (as detailed in the City's Local Biodiversity Strategy)
- coastal vegetation
- significant trees (refer to LLP 4.8).

The limited ability of the Project Area to supply Nature POS area is recognised by the City Wanneroo based on the site's topography and proximity to the Wanneroo City centre. It is unlikely therefore that areas within the site would be ecologically viable and meet the minimum viability criteria described in the LLP Schedule 5 (refer to Appendix 3). Retention opportunities are likely to be confined to individual trees and opportunities for retention are under consideration during the engineering design.

Local Planning Policy 4.8 Tree Preservation

The LLP 4.8 aims to provide a mechanism to protect significant trees within the CoW within the following specified areas:

- vacant land and bushland that will be subject to future development
- existing and proposed POS reserves.

Regarding tree retention within the Project Area, due regard will be given to the CoW (2004) Tree Preservation Policy (LPP 4.8), which provides for the incorporation of viable 'significant' trees. The significance criterion includes:

- age and condition
- height
- spread
- girth
- species, whether rare and endangered or not
- historical association
- habitat value
- landscape amenity value.

1.4 Existing environment

1.4.1 Vegetation

The Project Area has been regionally mapped by Beard (1981), and later updated by Shepherd *et al*. (2001) as vegetation association 6, which is characterised by Medium woodland; tuart & jarrah.

Heddle *et al*. (1980) described the vegetation complex of the Project Area as Karrakatta Complex-Central and South. This complex is characterised by open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri) and woodland of *Eucalyptus marginata* (Jarrah) - *Banksia* species. *Agonis flexuosa* (Peppermint) is co-dominant south of the Capel River.

A detailed flora and vegetation assessment was undertaken by 360 Environmental, comprising two field surveys in Spring 2016 (360 Environmental 2017). A total of three vegetation associations, and an additional 12 vegetation units were recorded (Figure 2; 360 Environmental 2017). The native vegetation associations recorded comprised:

- Mature trees of *Corymbia calophylla*, *Eucalyptus marginata*, *Allocasuarina fraseriana*, *Eucalyptus gomphocephala, Xanthorrhoea preissii* over weeds
- Tall Shrubland of *Jacksonia sternbergiana* and *Jacksonia furcellata* over *Xanthorrhoea preissii* and *Hakea prostrata* with occasional *Banksia attenuata*
- Closed Forest of *Corymbia calophylla* over *Xanthorrhoea preissii* and *Macrozamia riedlei*.

The remaining vegetation units recorded comprised isolated mature trees, and trees over gardens and weeds (360 Environmental 2017).

Vegetation condition ranged from Good to-Degraded to Completely Degraded within the Project Area (Figure 3; 360 Environmental 2017). The majority of the Project Area, comprising 35.9 ha, was in a Degraded to Completely Degraded condition (360 Environmental 2017). Historical clearing and (approved) land uses/activities have caused significant land degradation within the Project Area, which has affected the condition of remnant vegetation across the Project Area (360 Environmental 2017).

A site visit was undertaken by a Strategen botanist on 9 April 2018 to determine the vegetation values of the adjacent site. Due to access restrictions quadrat sampling, and subsequently statistical analysis, could not be undertaken. Rather, the site visit comprised walking the interface boundary of the proposal area and the adjacent site, and publicly accessible areas that abut the adjacent area.

The vegetation condition of the adjacent site appeared to range from Excellent to Completely degraded. Weeds were observed, with higher densities occurring at the adjacent area boundaries, likely due to edge effects. Aerial imagery shows that there are tracks running through the sites, this was confirmed during the site visit.

Vegetation within the adjacent site comprised *Eucalyptus marginata* and *Corymbia calophylla* mid open woodland over *Banksia attenuata*, *Banksia menziesii* and *Allocasuarina fraseriana* low woodland over *Xanthorrhoea preissii*, *Macrozamia riedlei* sparse and *Jacksonia sternbergiana* mid shrubland, over *Hibbertia hypericoides* and *Mesomelaena pseudostygia* low open shrubland. The vegetation within the adjacent site was assessed against the key diagnostic criteria provided in the approved conservation advice for the *Banksia woodlands of the Swan Coastal Plain* TEC (TSSC 2016) and was found to be analogous to the *Banksia woodlands of the Swan Coastal Plain* TEC (Figure 4).

1.4.2 Black Cockatoo habitat

CBC are endemic to the south-west of Western Australia. They primarily occur in uncleared remnant native eucalypt woodlands, particularly those that contain Salmon Gum and Wandoo, and in shrubland or kwongan heathland dominated by *Hakea, Dryandra, Banksia* and *Grevillea* species (Department of Sustainability Environment Water Population and Communities [DSEWPaC] 2012a). Current data on distribution of this species shows that there are numerous records from the Northern Swan Coastal Plain, including records in and around the Project Area.

The FRTBC is distributed through the humid and subhumid south-west of Western Australia from Gingin through the Darling Ranges, to the south-west from Bunbury to Albany (Johnstone & Storr 1998, Johnstone *et al.* 2013a). In these areas, the FRTBC inhabits dense Jarrah, Karri, and Marri forests that receive more than 600 mm average annual rainfall (Johnstone & Storr 1998). However, in recent years the FRTBC has moved on to the Swan Coastal Plain to forage in the Perth metropolitan area (Johnstone & Kirkby 2011). The FRTBC occurs in pairs or small flocks, or occasionally large flocks of up to 200 birds (Johnstone & Storr 1998). Current data on distribution of this species shows that there are numerous records along the Northern Swan Coastal Plain, including records in and around the Project Area.

Four fauna habitat types have been recorded within the Project Area (360 Environmental 2017).

- *Eucalyptus* Woodland – With Understorey (7.07 ha)
- *Eucalyptus* Woodland – No Understorey (6.43 ha)
- Shrubland (0.96 ha)
- Completely Degraded/Non-Endemic (3.27 ha).

A total of 14.5 ha of potential foraging habitat for CBC and FRTBC was recorded within the Project Area and is primarily associated with the *Eucalyptus* Woodland fauna habitat type (Figure 5).

A total of 264 Black Cockatoo potential breeding trees were identified within the Project Area during the Black Cockatoo habitat assessment undertaken in September 2016 (Figure 6; 360 Environmental 2017). None of the 264 potential breeding trees recorded contained suitable Black Cockatoo breeding hollows.

The Banksia Woodland TEC within the adjacent site also has potential foraging habitat for CBC and FRTBC, comprising *Eucalyptus* and *Banksia* woodland (Figure 4). A significant tree survey could not be undertaken within the adjacent site due to access restrictions.

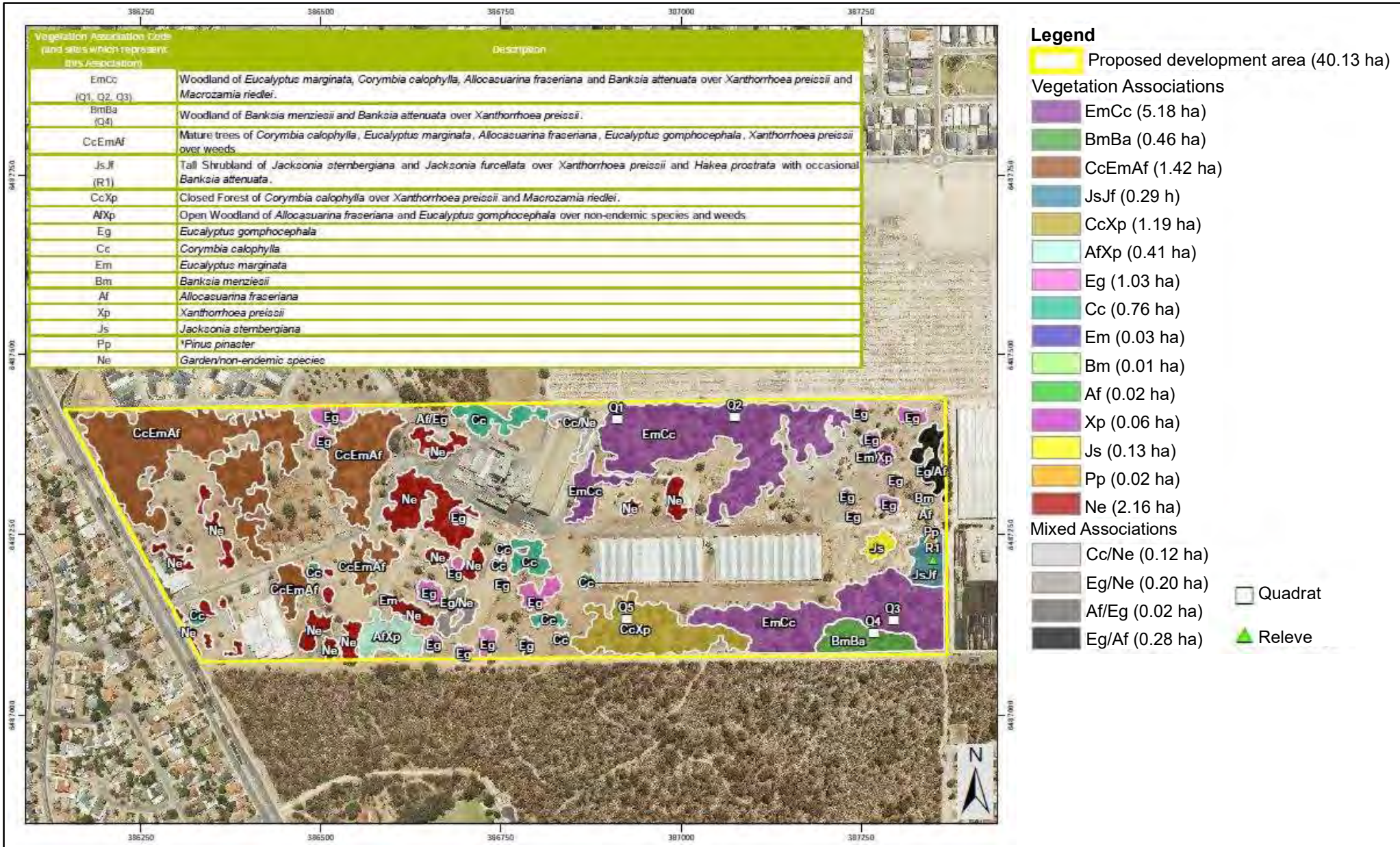

Figure 2: Vegetation Types within the Project Area

Data source: **360 Environmental 2017**
Coordinate System: GDA 94 zone 50
Date: 15/08/2018

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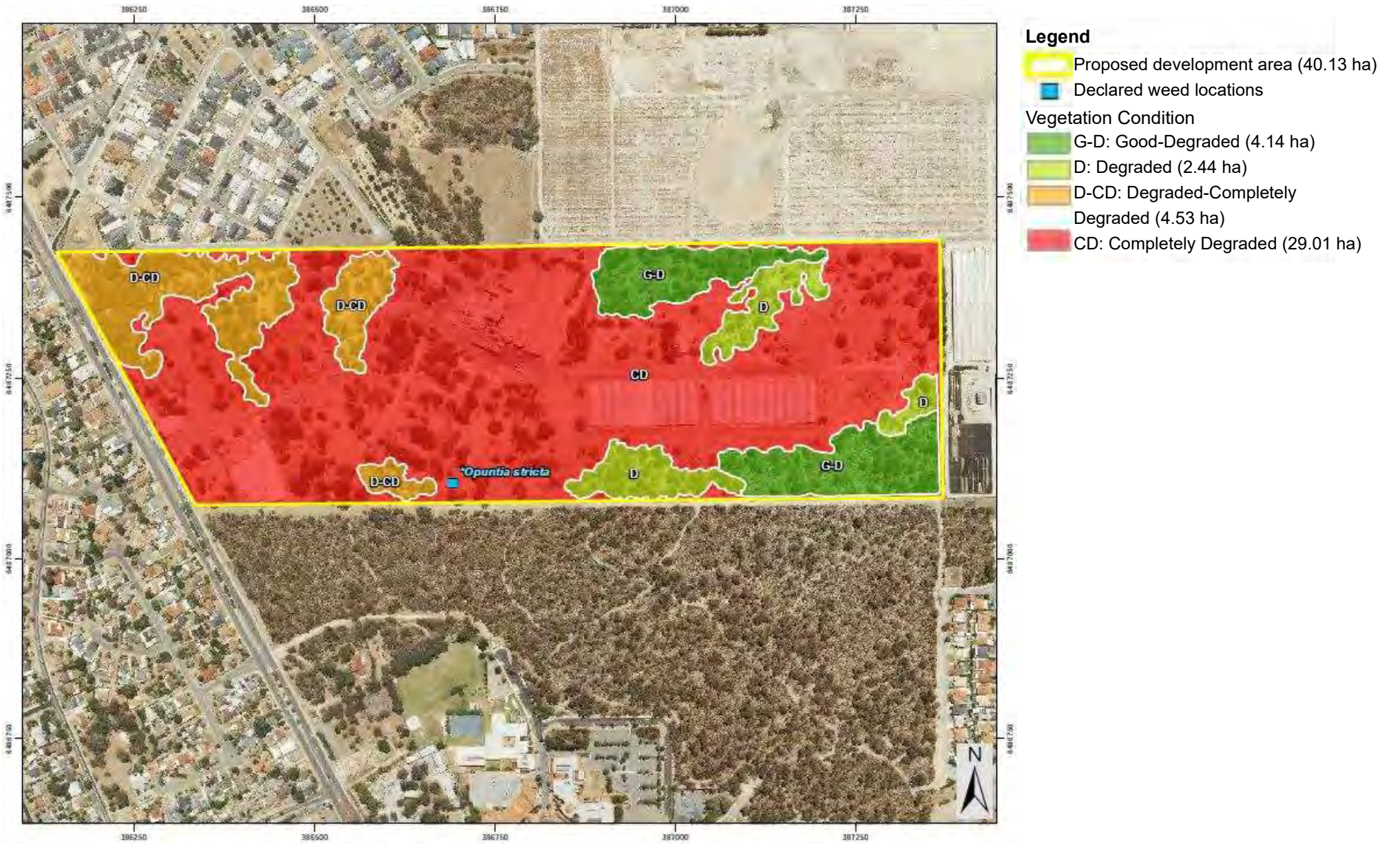

Figure 3: Vegetation Condition within the Project Area

Data source: **360 Environmental 2017**
Coordinate System: GDA 94 zone 50
Date: 15/08/2018

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Figure 4: Banksia Woodland TEC with the adjacent site

Scale 1:8,000 at A4

0 50 100 150 200 250 m

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Legend

- Adjacent site
- Lot 1665
- Banksia woodland

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 15/08/2018
Author: CThatcher
Source: Aerial image: Nearmap, flown 02/2018.

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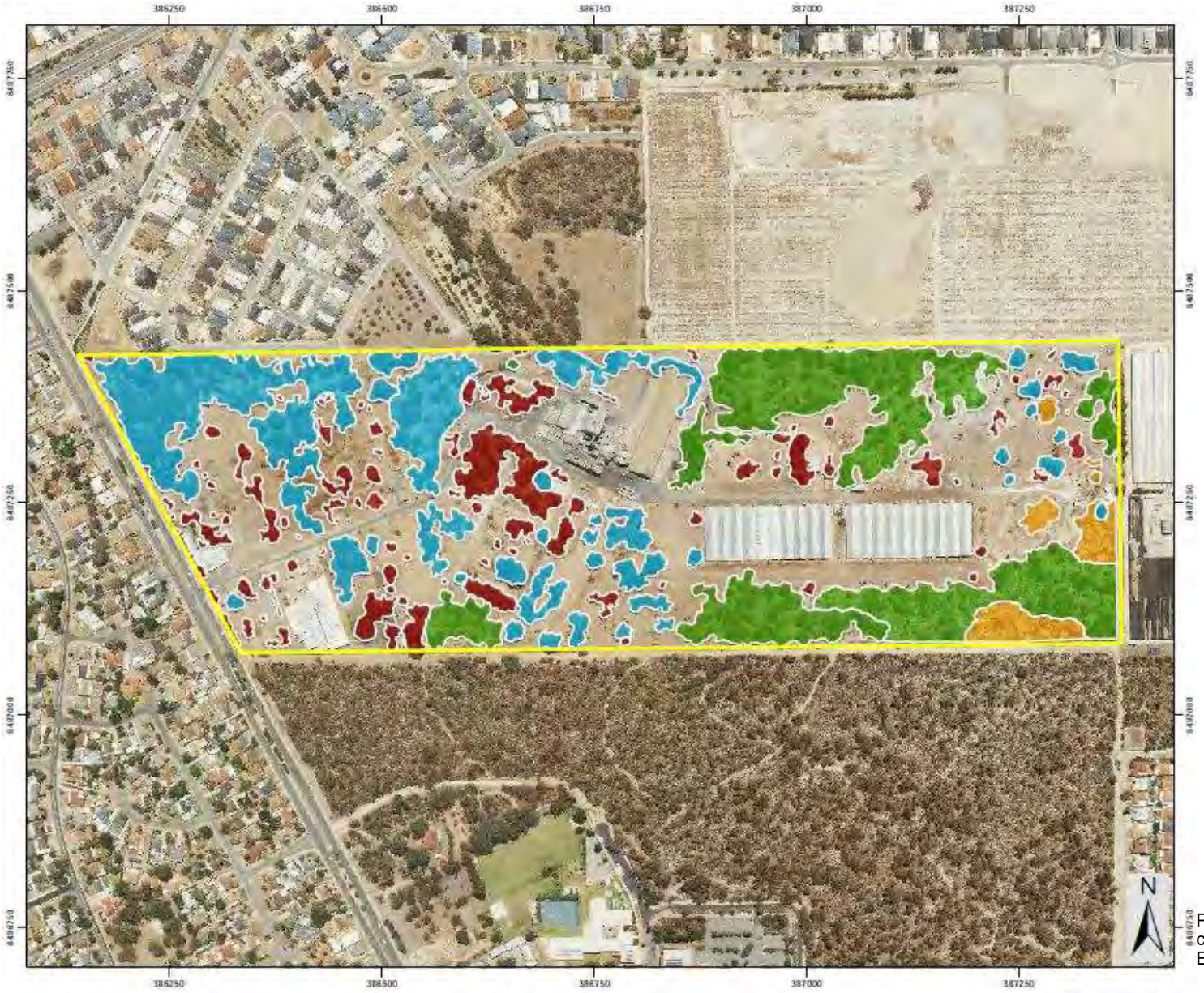

Legend

- Proposed development area (40.13 ha)

Fauna Habitat

- *Eucalyptus* Woodland - with understorey (7.07 ha)
- *Eucalyptus* Woodland - No understorey (6.43 ha)
- Shrubland (0.96 ha)
- Completely Degraded/Non Endemic (3.27 ha)

Please note that Black Cockatoo potential foraging habitat comprises Eucalyptus Woodland – With understorey, Eucalyptus Woodland – No understorey, and Shrubland.

Figure 5: Black Cockatoo potential foraging habitat

Data source: **360 Environmental 2017**

Coordinate System: GDA 94 zone 50

Date: 15/08/2018

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Figure 6: Black Cockatoo potential breeding trees

Data source: **360 Environmental 2017**

Coordinate System: GDA 94 zone 50

Date: 15/08/2018

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1.5 Potential impacts and risks

An assessment of the potential impacts and risks to CBC and FRTBC, and the adjacent Banksia Woodland TEC because of the Project Area being re-developed has been undertaken. Results of the risk assessment have been used in developing management measures that form part of this CEMP.

1.5.1 Threats to Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo habitat

Threats to CBC and FRTBC are described in the *EPBC Act referral guidelines for three threatened black cockatoo species* (DSEWPaC 2012b) and are summarised as follows:

Habitat loss and degradation, including:

- loss and isolation of mature, hollow-bearing trees necessary for breeding
- lack of or loss of younger age class trees required to replace old trees that die or are destroyed, leading to a shortage of hollows in the future
- loss, degradation and fragmentation of foraging habitat[1]
- removal of native vegetation corridors, restricting the birds' ability to migrate across the landscape
- loss, degradation and isolation of night roost sites and surrounding feeding or watering habitat
- loss and degradation of habitat by secondary impacts such as introduction of dieback caused by *Phytophthora cinnamomi* (and other plant diseases), weed invasion which can affect seed set, and hydrological changes (such as flooding, drainage or salinity).

Interactions with humans, including:

- death or injury when hit by cars or trucks, particularly road constructions that concentrate birds
- at roadsides to feed on roadside vegetation and spilt grain, or drink from rainwater retained as puddles on roadsides
- death or injury from crop protection measures which may trap or injure birds, or prohibit them from accessing nearby native vegetation
- disturbance to birds from noise, light, vibrations and fumes
- shooting of birds (for example where they are coming into conflict with humans over fruit or nut crops)
- poaching of birds and eggs.

Adverse impacts from invasive species, including:

- competition for nest hollows with European honeybees and invading bird species
- injury and death from European honeybees.

1.5.2 Threats to Banksia Woodlands of the Swan Coastal Plain TEC

Threats to the Banksia Woodlands of the Swan Coastal Plain TEC are described in TSSC (2016) and summarised as follows:

- the greatest threat is clearing and fragmentation. This includes:
  - clearing for urban developments, especially in the Perth metropolitan region but also in the urban centres of Bunbury and Busselton
  - associated urban degradation/disturbance such as rubbish dumping, uncontrolled vehicle access, wildflower and seed harvesting

[1] This is particularly important in breeding areas: removal of vegetation around breeding sites, and the removal of native vegetation corridors that connect breeding and foraging sites, reduces the amount of food available to breeding birds and can affect chick survival rates. Breaks of more than 4 km have been shown to prevent breeding birds reaching resources.

    - clearing for agriculture and horticulture (mainly in the past)
    - mining for basic raw materials (e.g. road/building materials), mineral sands and silica sands, that involve vegetation clearing and hydrological impacts
- dieback diseases (especially those caused by *Phytophthora* species)
- invasive species
- fire regime change (particularly increased fire frequency; prescribed burning during late autumn to late spring when plants are in active growth, flowering and seed development and animals are active)
- hydrological degradation (groundwater abstraction, eutrophication, soil acidification)
- climate change (increasing temperatures, declining rainfall, changing rainfall timing)
- grazing (including overabundance of kangaroos particularly in peri-urban reserves)
- decline in pollinating and seed dispersing fauna
- loss of keystone Banksia species and fragmenting of nectar/pollen nutritional networks e.g. loss of Banksia ilicifolia in water drawdown areas.

1.5.3 Potential impacts

Potential impacts to CBC and FRTBC, and the adjacent Banksia Woodland TEC as a result of the Project Areas re-development have been identified.

The key impacts to CBC and FRTBC as described in Table 1 have been derived from a review of threats as listed in Section 1.5.1 above. It should be noted that whilst the proposed action seeks the removal of all of the 14.5 ha of foraging habitat (inclusive of 264 Black Cockatoo potential breeding trees) the potential for construction impacts on CBC and FRTBC habitat have been identified through the following two avenues:

- the opportunity may exist to retain some significant trees on site (to be confirmed subsequently by the engineering design); and
- CBC and FRTBC habitat exists in the adjacent site.

Table 1: Potential impacts of the proposal on CBC and FRTBC

Impact	Description
Loss of foraging habitat and potential breeding habitat	The Project will result in the removal of up to 14.5 ha of foraging habitat and up to 264 potential breeding trees.
Habitat impacts through introduction and / or spread of dieback	While a dieback (*Phytophthora cinnamomi*) survey has not been completed for the Project Area. The re-development of the Project Area may introduce or spread dieback within the Project Area, which could lead to decline in vegetation health. Soil containing dieback may be transported on footwear and / or machinery and equipment used during clearing and construction operations.
Habitat impacts through introduction and / or spread of weeds	The Project has the potential to introduce new weed species and / or spread existing weeds spread weeds within the Project Area. Habitat contained in POS areas and road verges within the Project area are at higher risk of establishment of invasive species through edge effects. Soil containing weed and seed matter may be transported on footwear and/or machinery and equipment used during clearing operations.
Interactions with humans	There is the potential of death or injury to Black Cockatoo by vehicle strike within the residential development during and post construction.
Habitat impacts through hydrological changes	Residential development can result in hydrological changes such as changed water balance and flooding if not managed appropriately.
Reduction in the condition/quality of remnant vegetation within the adjacent lot (Lot 9000 Wanneroo Road)	The activities associated with the re-development of the Project Area may indirectly increase the risk of establishment of invasive species through edge effects and the introduction or spread of dieback.

Bushfire management has not been addressed within this Environmental Management Plan (EMP) as it is not considered a likely threat to Black Cockatoo or the Banksia Woodland TEC because of the development of the Project Area. Rather bushfire risk is likely to be decreased once the Project Area has been developed. A Bushfire Management Plan (BMP) will be development prior to subdivision approval with the objective of reducing the risk to residents from Bushfire. The BMP will ensuring adequate separation exists between the development, retained Black Cockatoo habitat and the adjacent site, to reduce the risk of incidental fire.

The key impacts to Banksia Woodlands of the Swan Coastal Plain TEC as described in Table 2 have been derived from a review of threats as listed in Section 1.5.2 above. Please note that while it is acknowledged that grazing by rabbits or kangaroos can impact Banksia Woodland TEC, given the large fence separating the Project Area and Banksia Woodland TEC it is highly unlikely that clearing and construction within the Project area will increase grazing within the adjacent Banksia Woodland TEC.

Table 2: Potential impacts of the proposal on adjacent Banksia woodland TEC

Impact	Description
Urban degradation / disturbance	Though unlikely, the project has the potential to result in unauthorised rubbish dumping, or rubbish drift from the Project area into the adjacent Banksia Woodland TEC. Unauthorised access to the adjacent Banksia Woodland TEC associated with the Project Area is unlikely as there is a large fence separating the boundary between the two.
Habitat impacts through introduction and / or spread of dieback	While a dieback (*Phytophthora cinnamomi*) survey has not been completed for the Project Area. The re-development of the Project Area may introduce or spread dieback into the adjacent Banksia Woodland TEC, which could lead to decline in vegetation health. Soil containing dieback may be transported on footwear and / or machinery and equipment used during clearing and construction operations.
Habitat impacts through introduction and / or spread of weeds	The Project has the potential to introduce new weed species and / or spread existing weeds spread weeds within the Project Area, and indirectly the adjacent Banksia Woodland TEC. Habitat contained at the boundary of the Project area and the adjacent Banksia Woodland TEC are at higher risk of establishment of invasive species through edge effects. Soil containing weed and seed matter may be transported on footwear and/or machinery and equipment used during clearing operations.
Hydrological degradation	The residential development could indirectly impact the adjacent Banksia Woodland TEC through hydrological changes.

2. Environmental outcomes and completion criteria

Management measures to avoid or reduce impacts to Matters of National Environmental Significance (MNES) are primarily focussed on managing clearing within the Project Area, retention of Black Cockatoo trees where practicable, and weed and pathogen management to be undertaken as part of on-site mitigation measures.

The ability for tree retention on the site will be influenced by engineering specifications due to the site's topography and the associated earthwork cut and fill that is required to enable development and tree retention viability assessment (refer to 1.3.4).

Objectives, interim targets, performance indicators and completion criteria to achieve environmental outcomes are detailed in Table 3.

Table 3: Objectives, interim targets, performance indicators and completion criteria to achieve environmental outcomes

Environmental outcome	Objective	Interim target	Performance indicators	Completion criteria
Protection of Black Cockatoo habitat and individuals	No more than 14.5 ha of potential CBC and FRTBC habitat is cleared from the Project Area.	To ensure no more than 14.5 ha of potential CBC and FRTBC habitat is cleared from the Project Area.	No clearing outside of approved boundary.	No more than 14.5 ha of potential CBC and FRTBC habitat is cleared from the Project Area at the completion of clearing.
	Application of the CoW LLP 4.8 Tree preservation.	Identification and retention of significant trees (in accordance with the definition under the policy) within POS and road reserves. Consideration of existing site topography in preliminary earthworks, servicing and drainage considerations, indicative street block layout.	Significant tree and viability assessment completed for the Project Area. No unapproved clearing of significant trees identified for retention.	Viable significant trees retained within the Project Area.
	Manage weeds, pests and plant pathogens within the Project Area.	Minimal damage to retained or landscaped vegetation within the Project Area (specifically POS areas, road reserves and along the boundary to the adjacent Banksia TEC) by weeds and plant pathogens.	No, or minor evidence of vegetation decline within the Project Area (POS areas, road reserves and along the boundary to the adjacent Banksia TEC) because of weeds and plant pathogens.	Two years from the commencement of maintenance#, the Project Area is free of significant^ weed species and plant pathogens.
	Minimise direct impacts to CBC and FRTBC individuals.	No clearing of potential breeding trees that have evidence of active CBC or FRTBC breeding from July to November. Vehicle speeds restricted to a maximum of 20km/hr during clearing and construction.	No death or injury to CBC or FRTBC caused by habitat clearing or vehicle collisions during or post construction.	Clearing records. No environmental incidents relating to collisions with CBC or FRTBC.
	No impacts to retained trees because of hydrological changes.	Development design and engineering to ensure no hydrological impacts to retained trees.	No evidence of tree decline within the Project Area because of hydrological changes associated with the Project.	No loss of retained trees within the Project Area because of hydrological changes.
Protection of adjacent Banksia Woodland TEC and Black Cockatoo habitat	No rubbish dumping or rubbish drift onto the adjacent site from the Project Area.	Removal of any rubbish drift along the boundary before it enters the adjacent Banksia Woodland TEC. Removal of any rubbish that has been dumped or drifted into the adjacent Banksia Woodland TEC from the Project Area.	No Project associated rubbish observed within the adjacent Banksia Woodland TEC.	At the completion of construction, the adjacent Banksia Woodland TEC is free of rubbish associated with the Project Area.

Environmental outcome	Objective	Interim target	Performance indicators	Completion criteria
	No weeds or pathogens spread from the Project area to the adjacent Banksia Woodland TEC.	No damage to adjacent Banksia Woodland TEC by weeds or plant pathogens associated with the Project Area.	No evidence of vegetation decline in the adjacent Banksia Woodland TEC because of pathogens from the Project Area.	At the completion of construction, the adjacent Banksia TEC is free of significant^ weeds and pathogens spread from the Project Area.
	No hydrological degradation because of the development of the Project Area.	Development design and engineering to ensure no hydrological impacts to the adjacent site.	No evidence of vegetation decline in the adjacent Banksia Woodland TEC because of hydrological changes associated with the Project Area.	At the completion of construction there is no impact to the adjacent Banksia Woodland TEC because of hydrological changes associated with the Project Area.

^Significance in this instance are defined as weeds, pests and plant pathogens that have serious impact on bushland, including Declared Pests under the BAM Act, Weeds of National Significance, Dieback and rabbits or others identified during monitoring.

#The commencement of maintenance is defined as the first round of weed control within the Project Area.

3. Risk assessment

A qualitative risk assessment has been undertaken using the methods, definitions and matrix described in the *Environmental Management Plan Guidelines* (Department of the Environment 2014). The risk framework is presented in Table 4 and the definitions for the qualitative measure of likelihood and consequence are presented in Table 5. The risk matrix is presented in Table 6.

Table 4: Risk framework

		Consequence				
		Minor	**Moderate**	**High**	**Major**	**Critical**
Likelihood	**Highly Likely**	**Medium**	**High**	**High**	**Severe**	**Severe**
	Likely	**Low**	**Medium**	**High**	**High**	**Severe**
	Possible	**Low**	**Medium**	**Medium**	**High**	**Severe**
	Unlikely	**Low**	**Low**	**Medium**	**High**	**High**
	Rare	**Low**	**Low**	**Low**	**Medium**	**High**

Table 5: Likelihood and consequence

Likelihood	Consequence
Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)	
Highly likely	Is expected to occur in most circumstances.
Likely	Will probably occur during the life of the project.
Possible	Might occur during the life of the project.
Unlikely	Could occur but considered unlikely or doubtful.
Rare	May occur in exceptional circumstances.
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing low cost, well characterised corrective actions.
Moderate	Moderate risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing well characterised, high cost/effort corrective actions.
High	High risk of failure to achieve the plan's objectives. Results in medium-long term delays to achieving plan objectives, implementing uncertain, high cost/effort corrective actions.
Major	The plan's objectives are unable to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.
Critical	The plan's objectives are unable to be achieved, may include widespread and severe environmental harm, with no evidenced mitigation strategies.

Project risks were determined based on key project impacts identified as part of the EPBC Act assessment process. Qualitative measures of likelihood and consequences were determined to establish a risk ranking in accordance with the risk framework (Table 4). Potential risks were ranked to determine inherent risk arising from a potential impact prior to the implementation of mitigation/management measures. Although all impacts/risks were ranked as having a low or medium residual risk, mitigation measures have been identified for each key impact/risk identified (summarised further in Section 4). The outcomes of the risk assessment are presented in Table 6.

Table 6: Risk assessment

Environmental / management outcome	Performance indicators	Risk related event or circumstance	Likelihood	Consequence	Risk level	Management measures	Residual likelihood	Residual consequence	Residual risk level	Detection/monitoring activity/ies	Contingency response	Feasible/effective corrective actions
Protection of Black Cockatoo habitat and individuals	No clearing outside of approved boundary.	Clearing outside of the authorised clearing boundaries resulting in more than 14.5 ha of Black Cockatoo habitat to be cleared.	Possible	Moderate	Medium	Section 4	Unlikely	Moderate	Low	Section 5	Section 6	High
	Significant tree and viability assessment completed for the Project Area.	Unnecessary loss of Black Cockatoo foraging and potential breeding habitat.	Possible	Moderate	Medium	Section 4	Rare	Moderate	Low	Section 5	Section 6	High
	No unapproved clearing of significant trees identified for retention.	Accidental and / or unapproved clearing of significant trees identified for retention within POS areas and road verges.	Possible	Moderate	Medium	Section 4	Rare	Moderate	Low	Section 5	Section 6	High
	No, or minor evidence of vegetation decline within the Project Area because of weeds and plant pathogens.	Introduction and / or spread of weeds and /or pathogens into POS areas, which could lead to decline in vegetation health.	Possible	Moderate	Medium	Section 4	Unlikely	Moderate	Low	Section 5	Section 6	High
	No death or injury to CBC or FRTBC caused by habitat clearing or vehicle collisions during or post construction.	Clearing of potential breeding trees actively being used by CBC or FRTBC, potentially resulting in injury or death of Threatened fauna. Death or injury of Black Cockatoo by vehicle strike within the residential development during and post construction.	Possible	High	Medium	Section 4	Rare	High	Low	Section 5	Section 6	High
	No evidence of tree decline within the Project Area because of hydrological changes associated with the Project.	Loss of retained trees, or decline in health, because of changed hydrology (i.e. potential for waterlogging or water stress).	Possible	Moderate	Medium	Section 4	Rare	Moderate	Low	Section 5	Section 6	High
Protection of adjacent Banksia Woodland TEC	No rubbish dumped or drifted into the adjacent Banksia Woodland TEC from the Project Area.	Degradation of the adjacent Banksia Woodland TEC through illegal rubbish dumping or rubbish drift from the Project Area.	Possible	Moderate	Medium	Section 4	Rare	Moderate	Low	Section 5	Section 6	High
	No, or minor evidence of vegetation decline in the adjacent Banksia Woodland TEC because of pathogens from the Project Area.	Habitat decline through introduction and / or spread of weeds and / or dieback.	Possible	High	Medium	Section 4	Unlikely	High	Medium	Section 5	Section 6	High
	No evidence of vegetation decline in the adjacent Banksia Woodland TEC because of hydrological changes associated with the Project Area.	Habitat decline because of hydrological changes.	Possible	High	Medium	Section 4	Rare	High	Low	Section 5	Section 6	High

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4. Management measures

4.1 Implementation

This CEMP will be implemented by Stockland through induction for personnel and contractors, the implementation of on-ground management actions and through the appointment of suitably qualified contractors.

4.2 Identification and delineation of areas to be cleared and retained

The identification and delineation of areas to be cleared within the Project Area is important to ensure that no unapproved clearing is undertaken. Furthermore, the identification and delineation of areas to be retained within POS and road verges is important during the design and construction phases, as well as post construction. If retained vegetation is not adequately delineated within these areas, it may become unnecessarily degraded during construction. Relevant management measures are provided in Table 7.

Table 7: Management measures for delineating and clearing and retention areas

Action	Timing	Responsibility
In determining the POS areas within the Project Area, assess the applicability of LLP 4.3 in the formulation of Nature POS in accordance with Schedule 5 as presented in Appendix 3. If the LLP4.3 Nature POS cannot be applied then the following criteria will be used (Adapted from Del Marco, 2004) to determine POS area(s): • size • shape • perimeter to area ratio • vegetation condition • connectivity with remnant vegetation adjacent to the Project Area.	Design phase (Subdivision)- prior to clearing.	Planner and Project Manager
Install temporary fencing or flagging to delineate areas / trees for retention, including root zone protection areas.	Prior to the commencement of work on site, where site works are adjacent (up to 50 m) to retained areas (once defined).	Construction contractor
Provide GPS co-ordinates of areas approved to be cleared and retained to the contractor to ensure no unapproved clearing is undertaken.	During construction.	Project Manager
Install appropriate temporary signage to restrict unauthorised access to retention areas (once defined).	Pre and during construction.	Construction contractor
Install and maintain appropriate separation between the retention area boundaries and development area interface to control access (for example fencing, bollards, footpaths, garden beds).	Post-construction.	Construction/ landscape contractor

4.3 Tree retention

As per the Flora and Fauna Survey (360 Environmental 2017), no suitable Black Cockatoo potential breeding hollows were recorded in the Project Area.

Once retention areas have been defined, there may be potential to retain some Black Cockatoo potential breeding habitat in the Project Area.

The identification, protection and delineation of Black Cockatoo habitat trees to be retained within POS areas and road verges is important during the design and construction phases, as well as post construction. If retained CBC and FRTBC trees are not adequately delineated and protected within these areas, tree may be cleared, or impacted through compaction or clearing around root zones. Relevant management measures are provided in Table 8.

Table 8: Management measures for tree retention

Action	Timing	Responsibility
Significant tree and viability assessment completed for the Project Area by an Arborist and assessed against engineering requirements to determine which trees can be retained within POS area(s) and road reserves. As per AS 4970-2009 Guidelines during this assessment consideration must be given to: • the condition of the trees • proximity to buildings • location of services • roads • level changes • building operation spaces • long term management.	Prior to clearing each stage	Project Arborist and Engineer in consultation with the proponent and City of Wanneroo
Conduct site inductions to inform personnel of: • trees identified for retention • procedures to minimise impacts to retained trees e.g. minimise compaction and disturbance around retained vegetation, employing directional drilling or manually excavated trenches (includes pneumatic and hydraulic tools) where possible around retained vegetation to minimise impact to roots • tree protection practices outlined the AS 4970-2009 Guidelines for the protection of trees on development sites.	Prior to commencing work on-site	Project Manager
Provide map and GPS co-ordinates of trees to be retained to the contractor to ensure no unapproved clearing is undertaken.	During construction	Project Manager
Clearly mark trees identified for retention with flagging tape and numbered tags.	During construction	Project Manager
If required install protective measures around the root protection zones of any potential breeding trees that are identified for retention, to manage the risk of intrusive, degrading activities such as unauthorised or accidental or clearing, and compaction.	During construction	Construction contractor

4.4 Black Cockatoo Management

CBC and FRTBC are a highly mobile species and as such direct impacts to individuals are unlikely. The greatest risk to CBC and FRTBC is if clearing is undertaken during the breeding season, which includes the egg laying period(July to November), and fledgling period (up to late February) (Birdlife Australia 2018) when birds are actively nesting within hollows. This is highly unlikely to occur with the Project area as no suitable hollows have been recorded at the site. CBC and FRTBC may also be susceptible to harm when foraging on road verges.

Relevant management actions will be implemented to reduce the risk of harm to CBC and FRTBC during and post construction Table 9.

Table 9: Management measures for Black Cockatoo

Action	Timing	Responsibility
If clearing during CBC and FRTBC breeding season (including egg laying period [July to November] and fledgling period [up to late February]) (Birdlife Australia 2018) inspect potential breeding habitat trees within 7 days prior to the commencement of clearing for each stage of development. If a black cockatoo is detected using a hollow in a tree or trees the following will occur: • clearly identify the tree or trees with flagging/fencing • demarcate (with flagging or fencing) a 10m buffer zone around the tree or trees- no earth works/clearing occur within the buffer zone until the hollow is no longer being used • qualified fauna specialist will determine the hollow activates and confirm that the tree or trees hollows are vacant, prior to earthworks/clearing commencing within the buffer zone.	July to November, prior to clearing and/or during construction of each phase	Fauna specialist
Prohibit the feeding of fauna.	During construction	Project Manager
Enforce a maximum speed limit of 20km/hr to minimise collisions with CBC and FRTBC.	During construction	Project Manager
Minimise the planting of CBC and FRTBC primary feeding species in areas that are expected to experience high volumes of traffic and/or have a maximum speed limit greater than 50km/hr.	During landscaping	Landscaping contractor
Contact the Department of Biodiversity, Conservation and Attractions (DBCA) Wildcare Helpline 24 hour emergency hotline on (08) 9474 9055 if sick or injured animals are encountered.	During construction	Project Manager

4.5 Weed and pathogen management

Weeds are unlikely as the proposal area is likely to be parkland cleared and managed, however management will be undertaken in response to the assessed need and assessed risk of potential to degrade both the Project Area and adjacent Banksia Woodland TEC.

Appropriate management measures will be implemented prior to, during and after construction works to minimise potential spread of weed and dieback infestations to vegetation within and adjacent to the Project Area.

Weed management will be implemented using several techniques, including:

- spot spraying – where hand-spraying apparatus is applied directly to the target plant
- hand weeding – physical removal of the weed.

Dieback mapping has not been undertaken for the Project Area. To reduce the risk of introducing or spreading dieback within and adjacent to the Project Area tubestock plants and other materials used in landscaping will be free of soil that may contain dieback or weeds (for example plants supplied by a NIASA accredited nursery).

Relevant management measures for weeds and pathogens are provided in Table 10.

Table 10: Management measures for weed and pathogen management

Action	Timing	Responsibility
Conduct a baseline weed survey within the Project Area (specifically POS areas, road reserves and along the boundary to the adjacent Banksia TEC) in accordance with DBCA standard operating procedures (DEC 2011) to establish baseline information.	Prior to clearing within the Project Area	Project manager
Monitor weeds in accordance with Section 5.1.	During construction	Project manager
If necessary, based on monitoring, develop a weed control program and appoint an experienced contractor to manage weeds within the Project Area.	During construction and post-construction for a period of three years up until handover of POS and road verges to CoW Frequency will depend on the type of weeds present based on the advice of a weed control expert	Project manager
During weed control the following practices will be implemented: • use of biodegradable marking dye during all spot spraying tasks • installation of safety warning signage around the perimeter of the area to be controlled including information on the type of weed control and planned timing (signage shall be in place prior to application, and removed once area has dried) • undertaking spraying only under calm weather as identified in the herbicide manufacturers recommendations.	During construction and post-construction for a period of two years up until handover of POS and road verges to CoW	Revegetation contractor
All plants and other materials used in landscaping will be free of soil that may contain dieback or weeds (i.e. plants supplied by a NIASA accredited nursery).	During landscaping	Revegetation contractor
All construction personnel will be inducted in relation to weed and dieback risk, potential impacts and management.	During construction	Construction contractor

4.6 Hydrological management

There is no hydrological connectivity between the Project Area and the adjacent Banksia Woodland TEC.

Stormwater will be managed through an Urban Water Management Plan (UWMP) in accordance with the Department of Water and Environmental regulation (DWER) decision process for Stormwater Management in Western Australia. All stormwater will be managed on site and there will be no discharge from the Project Area into the adjacent Banksia Woodland TEC.

Water balance targets will be managed as per the UWMP. Consumption of potable water will be minimised by providing waterwise landscaping packages to residential lots and encouraging resident s to install waterwise appliances within houses.

Table 11: Management measures for hydrological management

Action	Timing	Responsibility
Development design and engineering to: • ensure that gradients are managed to ensure that benching or batters will not be positioned where they will negatively impact any retained trees within the Project Area, or the adjacent site • stormwater is not directed toward retained trees or the adjacent site • drainage basins will not be positioned where they will negatively impact any retained trees, or the adjacent site.	Design phase	Project manager
Surface water management undertaken consistent with the requirements of the Department of Water and Environmental Regulation (DWER), and in conformance with the water sensitive urban design requirements of Better Urban Water Management (WAPC 2008).	Design phase	Project manager
Water to be infiltrated within the Project Area via vegetated basins and / or swales, to perform a biofiltration function and reduce the risk of hydrological impacts to retained trees or the adjacent site, and reduce the risk of mobilisation of dieback into the adjacent areas.	Design phase	Project manager

4.7 Urban degradation (Rubbish dumping and drift)

Rubbish drift into the adjacent Banksia Woodland TEC is unlikely due to the tall fence separating the Project Area and the adjacent site. Furthermore, illegal dumping of building materials from the Project Area is also unlikely. It should be noted that the adjacent site, though privately owned can be accessed by the public via a number of 4WD tracks. For this reason only rubbish associated with the Project Area will be removed from the adjacent site if required.

Table 12: Management measures for rubbish drift and dumping from within the Project Area

Action	Timing	Responsibility
Conduct site inductions to inform personnel that all rubbish is to be removed from site and disposed of appropriately.	Prior to construction	Project Manager
Monitor rubbish in accordance with Section 5.1.	During clearing and construction	Project manager
Remove of any rubbish drift along the boundary before it enters the adjacent Banksia Woodland TEC.	During clearing and construction	Project manager
Removal of any rubbish that has been dumped or drifted into the adjacent Banksia Woodland TEC from the Project Area.	Design phase	Project manager

5. Monitoring

5.1 Monitoring program

A monitoring program has been developed focusing on monitoring of the following items:

- clearing and retention
- tree retention
- weeds and dieback
- rubbish drift / dumping.

The following monitoring schedule (Table 13) has been developed to enable an assessment of the effectiveness of the management actions outlined in Table 7, Table 8, Table 9 and Table 10.

Table 13: Monitoring schedule

Monitoring activity	Performance Targets	Parameter/s measured	Where	When	Related approved survey/monitoring guidelines	Reliability
Assessment of clearing boundaries	No clearing outside approved boundary	Site inspection to assess the condition of fencing used to delineate areas of retention, and barriers used to block unwanted access	Around retention areas (once defined) near clearing boundaries	Fortnightly for the first 6 months following commencement of clearing and then quarterly thereafter during construction	N/A	High
		Approved clearing boundaries cross referenced against site inspections and/or current aerial photography	Clearing boundaries	Fortnightly during clearing, or as otherwise required by regulatory authorities as part of construction site inspections	N/A	High
		Total area cleared not to exceed a total of 14.5 ha	Project Area	Annually during construction after clearing has commenced	N/A	High
Assessment of tree retention	Significant tree and viability assessment completed for the Project Area	Completed significant tree and viability assessment report	Project Area	Prior to clearing of each stage	• AS 4970-2009 Guidelines • City of Wanneroo LLP 4.8 Tree preservation	High
	No unapproved of clearing significant trees identified for retention	Site inspection to record status of retained trees (i.e. retained or cleared)	Project Area	With two weeks of completion of clearing within each stage	N/A	High
Assessment of impacts to Black Cockatoos	No clearing of potential breeding trees that have evidence of active Black Cockatoo breeding	Inspect all potential Black cockatoo breeding habitat tree(s) with suitable hollows;	Clearing areas	Within 7 days prior to earth works/clearing commencing in each stage	N/A	High
		Record of fauna expert appointed to inspect clearing area for Black Cockatoo activity and associated report/memo	Clearing areas	Prior to clearing in July to November	N/A	high
		Ensure that 10m buffer zones around tree or trees are maintained	Clearing areas	As required until hollow is vacant.	N/A	High

Monitoring activity	Performance Targets	Parameter/s measured	Where	When	Related approved survey/monitoring guidelines	Reliability
	No death or injury to Black Cockatoo caused by vehicle collisions	Evidence of vehicle speeds restricted to a maximum of 20km/hr (i.e. inductions and signage)	Project Area	During clearing and construction	N/A	High
		Reports of fauna collisions	Project Area	Opportunistically during clearing and construction	N/A	High
Weed and pathogen assessment	No increase in weed distribution of species. No evidence of plant pathogens within the Project Area	Site walkover by a qualified consultant (Botanist/Ecologist) to assess distribution, and abundance of weed species, and evidence of decline in tree health	POS areas, road reserves and along the boundary to the adjacent Banksia TEC, within the Project Area	Annually in spring following commencement of construction until handover to CoW	N/A	High
Assessment of rubbish drift / dumping	No Project associated rubbish observed within the adjacent Banksia Woodland TEC	Site inspection to assess project associated rubbish drift / dumping in the adjacent Banksia Woodland or along the boundary	Within the Project Area, along the boundary fence between the Project Area and the adjacent Banksia Woodland TEC	Fortnightly during clearing and construction	N/A	High

5.2 Data handling and management

Data collected by the Environmental Consultant and/or any other specialists in the course of monitoring activities will be provided to the Stockland Project Manager who will ensure all data and records are stored and maintained to inform reporting, review and compliance assessments. Numerical data will preferably be stored using Microsoft Excel and spatial data in shapefile format or similar widely used formats.

Data will be provided to the Stockland Project Manager upon submission of monitoring reports and will be reported to the DEE as part of the EPBC annual compliance report.

6. Contingency response, corrective actions

Contingency measures will be initiated if monitoring indicates that interim targets, completion criteria and performance indicators are not being met. Table 14 outlines triggers relating to each environmental outcome and subsequent interim targets, performance indicators and contingency measures. Given the environmental outcomes and objectives of the CEMP relate to the protection of Black Cockatoo habitat and the adjacent Banksia Woodland TEC, the contingency measures in this section are used as the 'environmental emergency procedures' referred to in DotE 2014, i.e. serious environmental incidents such as hydrocarbon spills are considered negligible risk.

Table 14: Contingency measures

Trigger	Contingency action	Responsibility
Delineation of retained vegetation		
Unauthorised clearing beyond approved boundaries	• Determine extent of additional clearing. • Report additional clearing to DEE. • Undertake required remedial measures as determined by DEE.	Project manager
Tree retention		
Clearing of significant tree identified for retention	• Determine extent of tree removal. • Report additional clearing to DEE. • Undertake required remedial measures as determined by DEE.	Project Manager / Environmental Consultant
Direct impacts to Black Cockatoos		
Active Black Cockatoo nesting observed in stages proposed to be cleared	• Mark the tree(s) with flagging tape. • Report nesting tree to Project Manager. • Install temporary bunting and signage to provide a 10m buffer zone around the nesting tree(s). • Retain the nesting tree(s) during the breeding season, including egg laying period (July to November) and fledgling period (up to late February) (Birdlife Australia 2018) • Re-inspect the nesting tree(s) at the end of the breeding season to confirm all birds have vacated the nest. • Report the status of the nesting tree(s) to the project manager and suitability for clearing.	Fauna specialist and Environmental Consultant
Vehicle collisions with Black Cockatoo	• Investigate cause. • Undertake intervention or remediation works (e.g. further reduce speed limit, educate workforce). • Monitor success. • Report to Project Manager.	Construction contractor
Weeds and pathogens		
Observations indicate presence of dieback within the Project Area	• Identify potential sources of dieback spread and determine likely cause. • Map dieback affected areas. • Undertake dieback control -control methods may include phosphite treatment to minimise the spread of dieback. • Review success of dieback control methods and continue monitoring. • Review and update management plan accordingly.	Dieback consultant
Introduction of new significant weed species to the Project Area	• Map the distribution of the newly introduced significant weed species. • Identify activities that may have potentially introduced the significant weed species. • Plan and implement a significant weed control program (may involve seeking advice from relevant authorities). • Apply hygiene control and education measures.	Environmental consultant
Increase in distribution or abundance of a significant weed species within the Project Area	• Identify activities that may have potentially increased the abundance, distribution or density/cover of significant weed species. • Plan and implement a significant weed control program (may involve seeking advice from relevant authorities). • Apply hygiene control and education measures.	Environmental consultant

Trigger	Contingency action	Responsibility

Incorrect hygiene procedures being undertaken	• Determine why appropriate hygiene procedures were not followed.
	• Implement remedy, which could include:
	  ⁎ educating employees on appropriate hygiene measures.
	  ⁎ erect signs to highlight prohibited access.
	• Review education measures (e.g. inductions, toolbox/site meetings and communications).
	• Monitor success of control.
		Project manager

Rubbish control		
Project associated rubbish observed along the boundary fence and / or within the adjacent Banksia Woodland TEC	• Removal of any rubbish drift along the boundary. • Removal of any Project associated rubbish dumped in the adjacent Banksia Woodland TEC from the Project Area. • Review education measures (e.g. inductions, toolbox/site meetings and communications). • Monitor success of control.	Project manager

7. Environmental management roles and responsibilities

All contractors and staff will be required to operate in accordance with this CEMP. Key personnel and responsibilities are described in the following sections.

7.1 Stockland Project Manager

The primary responsibilities of the Project Manager include:

- act as primary liaison between DEE, City of Wanneroo (CoW) and contractors
- engage suitably qualified contractors to implement the CEMP as required
- ensure all contracts contain relevant CEMP provisions and check these provisions are undertaken
- review reports provided by the contractors as required
- ensure all site personnel are aware of the requirements of the CEMP
- report to DEE in accordance with Conditions of EPBC 2017/7921 (to be advised)
- act as the key 'Emergency Contact', responsible for implementation of emergency response procedures (detailed in Section 6)
- technical review of and evaluation of the monitoring program.

7.2 Construction Contractor

The primary responsibilities of the Construction Contractor include:

- assist the Project Manager to ensure construction activities do not adversely affect Black Cockatoo habitat retained within the Project Area, or Banksia Woodland TEC adjacent to the Project Area
- ensure all site personnel are aware of the requirements of the CEMP and related plans
- provide support to the Project Manager as required during the construction phase
- maintain relevant records and provide reports on clearing activities to the Project Manager including:
  - map showing the areas of clearing and delineation works that have occurred
  - key construction dates
  - environmental incidents, relevant meeting minutes (e.g. toolbox) and environmental observations (e.g. Black Cockatoos).

7.3 Environmental Consultant

The primary responsibilities of the Environmental Consultant include

- identify Black Cockatoo foraging habitat that may be possible to retain within POS areas, once they are defined
- technical review of and evaluation of the monitoring program.

7.4 Landscaping Contractor

The primary responsibilities of the Landscaping Contractor include:

- maintain relevant records and provide progress activity reports to the Project Manager that include details of activities undertaken, including, for example:
  - weed control details (herbicide name, volumes, method, date and location, weather conditions, other relevant observations)
- ensure all landscaping personnel are aware of the requirements of the CEMP and related management plans.

7.5 Dieback Survey Contractor

The primary responsibilities of the Dieback Survey Contractor include:

- conduct baseline survey of the Project Area to determine the location of any existing dieback infestations if required
- provide a report and map to inform hygiene management and location of landscaping works if required.

8. Glossary of terms

Banksia Woodland TEC	Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community
BMP	Bushfire Management Plan
CBC	Carnaby's Black Cockatoo
CEMP	Construction Environmental Management Plan
CoW	City of Wanneroo
Cth	Commonwealth
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DEE	Department of Environment and Energy (Cth)
Development Area	Lot 1665 Wanneroo Road, Sinagra (excluding POS)
DotE	Department of the Environment (Cth; former)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Cth; former)
DWER	Department of Water and Environment Regulation
EMP	Environmental Management Plan
EPBC Act	Environmental Protection and Biodiversity and Conservation Act 1999 (Cth)
FRTBC	Forest Red-tailed Black Cockatoo
MNES	Matters of National Environmental Significance
MRS	Metropolitan Region Scheme
NIASA	Nursery Industry Accreditation Scheme Australia
LLP	Local Planning Policy
Project Area	Lot 1665 Wanneroo Road, Sinagra (including POS)
POS	Public Open Space
Sinagra	East Wanneroo Cell 2
Stockland	Stockland Development Pty Ltd
Strategen	Strategen Environmental
UWMP	Urban Water Management Plan
WAPC	Western Australian Planning Commission

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Appendix 1
EPBC Act Decision Referral (2017/7921)

EPBC Ref: 2017/7921

Mr Michael Parkinson
Group Property Consultant
Inghams Group Limited
1-3 Julius Avenue
NORTH RYDE NSW 2113

Dear Mr Parkinson

Decision on referral
Development of Lot 1665 Wanneroo Road, Sinagra, WA

Thank you for submitting a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This is to advise you of my decision about the referral of the proposed action, to clear native vegetation for the residential development of Lot 1665 Wanneroo Road, Sinagra, approximately 23 km north of Perth, Western Australia.

As a delegate of the Minister for the Environment and Energy, I have decided under section 75 of the EPBC Act that the proposed action is a controlled action and, as such, it requires assessment and a decision about whether approval for it should be given under the EPBC Act.

The information that I have considered indicates that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- Listed threatened species and communities (sections 18 & 18A)

Based on the information available in the referral, the proposed action is likely to have a significant impact on the following matters of national environmental significance, but not limited to:

- Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) – endangered

  Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) – vulnerable

  The proposed action involves the clearing of 14.5 ha of foraging and potential breeding and roosting habitat, including 264 potential breeding trees.

A copy of the document recording this decision is enclosed.

Please note that this decision only relates to the potential for significant impacts on matters protected by the Australian Government under Chapter 2 of the EPBC Act.

I have also decided that the project will need to be assessed by preliminary documentation.

Each assessment approach requires different levels of information and involves different steps. All levels of assessment include a public consultation phase, *in which any third parties can comment on the proposed action.*

Indigenous communities may also need to be consulted during the assessment process. For more information on how and when indigenous engagement should occur during environmental assessments, please refer to the indigenous engagement guidelines at http://www.environment.gov.au/epbc/publications/engage-early.

Please note, under subsection 520(4A) of the EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000* your assessment is subject to cost recovery. Please find attached a copy of the fee schedule for your proposal and an invoice for Stage 1. Fees will be payable prior to each stage of the assessment proceeding. Further details on cost recovery are available on the Department's website at: http://www.environment.gov.au/epbc/cost-recovery.

If you disagree with the fee schedule provided, you may apply under section 514Y of the EPBC Act for reconsideration of the method used to work out the fee.
The application for reconsideration must be made within 30 business days of the date of this letter and can only be made once for a fee. Further details regarding the reconsideration process can be found on the Department's website at: http://www.environment.gov.au/epbc/cost-recovery.

Details on the assessment process for the project and the responsibilities of the proponent are set out in the enclosed fact sheet. Further information is available from the Department's website at http://www.environment.gov.au/topics/environment-protection/environment-assessments.

A copy of the document recording these decisions is enclosed.

While I have determined that your project will be assessed by preliminary documentation, some further information will be required to be able to assess the relevant impacts of the action. You should expect to receive a letter from the Department within 10 business days of the payment of Stage 1 fees, outlining the information required.

The project manager will contact you shortly to discuss the assessment process.

I have also written to the following parties to advise them of this decision:

- Western Australian Department of Environment Regulation
- Western Australian Office of the Environmental Protection Authority
- Western Australian Department of the Premier and Cabinet.

You may elect under section 132B of the EPBC Act to submit a management plan for approval at any time before the Minister makes an approval decision of the proposed action under section 133 of the EPBC Act.

If an election is made under section 132B of the EPBC Act, cost recovery will apply to the approval of any action management plans you submit.

Cost recovery does not apply to the approval of action management plans where you do not elect to submit an action management plan for approval under section 132B of the EPBC Act and the approval of the action management plan does not arise from a variation to the approval conditions that you have requested.

Where you vary an approval condition and it results in you being required to submit an action management plan for approval, cost recovery will apply to the approval of the action management plan. Please refer to Attachment A for more details.

Please also note that once a proposal to take an action has been referred under the EPBC Act, it is an offence under section 74AA to take the action while the decision making process is on-going (unless that action is specifically excluded from the referral or other exemptions apply). Persons convicted of an offence under this provision of the EPBC Act may be liable for a penalty of up to 500 penalty units. The EPBC Act is available on line at: http://www.environment.gov.au/epbc/about/index.html

The Department has recently published an *Environmental Impact Assessment Client Service Charter* (the Charter) which outlines the Department's commitments when undertaking environmental impact assessments under the EPBC Act. A copy of the Charter can be found at: http://www.environment.gov.au/epbc/publications/index.html.

If you have any questions about the referral process or this decision, please contact the project manager, Sophie Burke, by email to Sophie.Burke@environment.gov.au, or telephone (02) 6274 2061 and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

Tim Wyndham
Acting Assistant Secretary
Assessments (WA, SA, NT) and Air Branch
29 June 2017

Appendix 2
Local Structure Plan

EAST WANNEROO CELL 2 - ADOPTED STRUCTURE PLAN No.4

Includes Amendment No. 2- 5, 7, 9 -12, 14

CAPORN STREET

ROAD

2A Public Open Space 3.8514 ha

2F P.O.S. 7159 sqm

2G P.O.S. 4975 sqm

2B P.O.S. 6308 sqm

PINJAR

VINCENT ROAD

2C Public Open Space 5.1772 ha

2H P.O.S. 7515 sqm

Primary School 3.5 ha

GRIFFITHS

2D Public Open Space 3.0404 ha

2E Public Open Space 2.6710 ha

WANNEROO ROAD

N

GDA

WANNEROO TOWN CENTRE

Subject to Agreed Structure Plan No. 23

MAJOR DISTRICT CENTRE

DUNDEBAR ROAD

MAJOR DISTRICT CENTRE & EXISTING SHOPPING CENTRES

Legend

- CELL BOUNDARY
- PUBLIC OPEN SPACE
- SCHOOL
- DRAINAGE SUMP
- R10
- R25
- R30
- R40
- SPECIAL RESIDENTIAL

NOTE: Unless otherwise denoted the residential code is R20.

0 100 200 400 Metres

City of Wanneroo

Produced by Planning & Sustainability

22/10/2015

Appendix 3
City of Wanneroo LLP 4.3

AUTHORISATION	**Adopted 5 April 2016 (PS01-04/16)**
REVIEW	**Biennial. Next scheduled review 2018.**

Part 1
POLICY OPERATION

Policy Development

This policy has been prepared under clause 4 of the deemed provisions of the City of Wanneroo District Planning Scheme No. 2.

Purpose and Application

The policy articulates Council's position on the planning, provision, location, design, development and interim maintenance of Public Open Space (POS) and is to be considered by applicants, Administration, and Council in the design, assessment, and determination of:

- Scheme amendments;
- Structure plans;
- Detailed area plans;
- Subdivision applications; and
- Development applications.

The purpose of this policy is to:

- Ensure that POS is delivered to optimise community benefit;
- Provide local interpretation of the WAPC Liveable Neighbourhoods policy; and
- Guide Council, its officers and applicants in considering the planning of POS in new urban areas.

For regional open space, foreshore reserves, Bush Forever or POS for which the statutory responsibility lies with the Western Australian Planning Commission or other State Government body, the City will seek guidance from this Policy where it has been referred to for comment.

Relationship to Other Policies, Guidelines and Documents

The Policy should be read in conjunction with Liveable Neighbourhoods (WAPC, Oct 07), Public Open Space Classification Framework (Department of Sport and Recreation, 2012), Better Urban Water Management (WAPC, 2008), Public Parkland Planning and Design Guide (WA) (Government of Western Australia, 2014), Cultural Heritage Due Diligence Guidelines (Department of Aboriginal Affairs, 2013) and other City of Wanneroo policies and documents where relevant as below:

- Landscape Upgrades to Distributor Roads and Parks Policy;
- Acquisition and Development of Community Purpose Sites Policy;
- Local Planning Policy 4.1: Wetlands;
- Local Planning Policy 4.2: Structure Planning;
- Local Planning Policy 4.4: Urban Water Management;
- Local Planning Policy 4.8: Tree Preservation Policy;

- Guidelines for the Subdivision of Land;
- Public Open Space Landscape Design Specification;
- Land Development Landscape Submission Process and Requirements; and
- Park Sign Specification.

In the event of any inconsistency between this Policy and any City of Wanneroo specification, this Policy will prevail.

Objective

To ensure new POS areas provide a balance of the following:

- A diversity of recreational uses and options for the community;
- Nature spaces protecting local natural assets whilst providing the community with managed access;
- Incorporation of water sensitive urban design principles;
- High levels of amenity;
- Affordability (including consideration of future maintenance costs);
- Environmental sustainability; and
- Sports sites for organised sporting activities.

Structure

This Policy is made up of two parts:

Part 1 Policy Operation: Includes the policy objectives.

Part 2 Policy Provisions: Sets out the Policy provisions for the following:

- Planning information requirements for POS at the relevant stages of the planning process
- Provision, allocation and distribution of POS
- Design requirements of POS
- Development requirements of POS
- Urban water management in POS; and
- Irrigation of POS

Part 2

GENERAL POLICY PROVISIONS

1. Planning Information Requirements for POS

1.1 Refer to the City's Local Planning Policy 4.2: Structure Planning for details of supporting information for a Local or Centre Structure Plan containing POS.

Subdivision

1.2 In support of a subdivision proposal that contains POS the City will require a Public Open Space Plan ('POS Plan') depicting the following information:

- All proposed POS in the developable area;
- Size (in square metres) and type of each POS;
- Proposed facilities to be accommodated in each POS (including any proposed variations to the Standard Development Requirement contained in Schedule 2);
- High level play space strategy for each POS containing play items (including proposed play area location, age group/s to be accommodated, type/s of play items (e.g. natural elements, off-the-shelf);
- Location of significant trees to be retained in POS (in accordance with the Significant Tree Survey);
- Indicative area (in square metres) of permanent irrigation of turf for each POS;
- Calculations demonstrating compliance with the POS design criteria and reduced average irrigation rate (refer to Schedule 6 – Irrigation Requirements) as outlined in the City of Wanneroo and Department of Water's North West Corridor Water Supply Strategy'
- Proposed small, minor and major rainfall event drainage management areas to be contained in POS;
- Location of POS subject to conditions imposed under Environmental Protection and Biodiversity Conservation Act 1999.; and
- Proposed function/s of POS (Sport, Nature and/or Recreation);

1.2.1 If the subdivision proposal corresponds to a POS Plan that has been approved by the City, an updated POS Plan will be required to be approved by the City where changes are proposed to any of the points listed in clause 1.2 above.

1.3 The City will require the following additional information to support any subdivision proposal that contains POS:

1.3.1 Updated POS schedule (in accordance with Liveable Neighbourhoods); and

1.3.2 Landscape and Irrigation Detailed Design Drawings (in accordance with "Guidelines For the Development and Subdivision of Land - 2003'' manual, "Local Government Guidelines for Subdivisional Development - 2009" manual and any other associated standard, guideline and management plan; and

1.4 Prior to preparation of Landscape and Irrigation Detailed Design Drawings, it is recommended that Landscape Concept Plans are prepared and lodged with the City for the purpose of discussion and preliminary design comment.

2. Provision of Public Open Space

2.1 A minimum 10% of the gross sub-divisible area shall be ceded as POS as per Liveable Neighbourhoods.

2.2 Greater than 10% may be considered acceptable and/or necessary where there are specific environmental, cultural or historic values that require protection to enhance the character of the local area or where it is considered essential to provide larger scale sport spaces. In these instances, a Financial Assessment Report detailing the likely financial implications of providing additional space (i.e. life cycle costs and maintenance regimes for the POS assets) may be required to be prepared by the applicant.

2.3 Less than 10% may be considered appropriate in centre zones where higher densities are proposed subject to:

2.3.1 A minimum of 10% POS being provided in the wider catchment (i.e. outside the centre) ; and

2.3.2 The balance of POS being paid as Cash-in-Lieu to enhance the quality of the POS provided in the wider catchment.

2.4 Clauses 2.2 to 2.3 shall be subject to discussion and approval of the City of Wanneroo following consultation with the applicant and relevant authorities.

2.5 POS shall be classified as either unrestricted POS or restricted POS as per Liveable Neighbourhoods. Schedule 1 outlines the types of POS applicable to each of these categories.

Unrestricted POS

2.6 Unrestricted POS shall constitute a minimum of 8% of the gross sub-divisible area as per Liveable Neighbourhoods.

Restricted POS

2.7 Restricted POS may constitute a maximum credit of 2% of the gross sub-divisible area as per Liveable Neighbourhoods where the requirements for unrestricted open space in Section 3 of this part (Allocation and Distribution of POS) have been met.

2.8 Restricted POS in excess of 2% of the gross sub-divisible area shall not be credited towards the overall POS obligation.

2.9 Restricted POS provided in excess of 2% of the gross sub-divisible area (in accordance with Clause 2.8) shall be considered as a deduction from the gross subdivisible area.

Cash-in-Lieu of POS

2.10 The City will accept cash-in-lieu of POS where it is considered that the provision of 10% of the gross subdivisible area for POS will not result in spaces of sufficient size or quality to be of benefit to the community, or where sufficient space already exists in the surrounding areas.

2.11 Where Cash-in-lieu is considered acceptable under Clause 2.10, the applicant shall contribute up to the total POS requirement, the market value of the land (as defined under Section 155 of the Planning & Development Act 2005) required as cash-in-lieu to be kept in Trust for the future provision and/or development of POS and related community facilities.

2.12 The provision of Cash-in-Lieu of POS is subject to the agreement of the Western Australian Planning Commission under Section 153 of the Planning & Development Act 2005.

3. Allocation and Distribution of POS

3.1 A variety of POS shall be provided within a specified area that ensures a balance of sizes, types, functions and locations within a community. The provision of POS shall be in accordance with the requirements of the POS Hierarchy shown at Schedule 2.

3.2 Unless otherwise provided for by Clause 3.3 of this policy, POS shall:

3.2.1 be located within the nominated walkable distances from dwellings prescribed by Schedule 2 or where no distances are provided, in accordance with other location criteria as specified;

3.2.2 be of a minimum size for the relevant type of POS as per Schedule 2; and

3.2.3 be fit for its intended purpose in terms of:

- Location
- Size
- Shape
- Topographical nature

3.3 Exceptions

3.3.1 The provision of a District Open Space shall negate the need for a Neighbourhood and Local Open Space within the walkable catchment of the District Open Space location;

3.3.2 The location of a Neighbourhood Open Space shall negate the need for a Local Open Space within the walkable catchment of the Neighbourhood Open Space location; and

3.3.3 POS exhibiting "unacceptable criteria" as per Schedule 2 shall not be accepted.

Sport POS

3.4 A minimum of 4% of the gross sub-divisible area shall be allocated for sport POS unless the City is satisfied that one or more of the following criteria are met:

- there is already sufficient existing sport POS within close proximity;
- in the case of a subdivision, sport POS is identified elsewhere in an endorsed District Structure Plan or Local Structure Plan;
- the provision of 4% sport POS would not result in a usable space for active recreation (i.e. too small);
- the land is constrained by environmental/natural/physical/cultural factors; and
- the provision of 4% sport POS would have an adverse effect on walkability/connectivity of POS in the locality.

3.5 A district sport POS shall be provided for every two (2) government high schools planned within a development area (i.e. 1 per 13,000-14,000 lots);

3.6 Organised/formal sporting functions shall be restricted to neighbourhood, district and regional level POS.

3.7 Where possible, the grouping of sports playing fields to create multipurpose sports precincts should be explored.

Nature POS

3.8 A minimum of three percent (3%) of the gross sub-divisible area shall be provided as POS for the purposes of conservation and recreation where any of the following significant natural assets exist:

- Threatened and Priority Ecological Communities;
- Declared Rare and Priority Flora Species;
- Specially Protected and Priority Fauna Species;
- Matters of National Environmental Significance (as per The Environment Protection and Biodiversity Conservation Act 1999);
- Wetlands (in accordance with Schedule 1);
- Karstic features e.g. caves and pinnacles;
- Vegetation complexes with less than 30% of their original extent remaining (as detailed in the City's Local Biodiversity Strategy);
- Coastal Vegetation;
- Significant Trees (as defined by the City's Tree Preservation Policy).

POS provided for this purpose should be ecologically viable and meet the minimum viability criteria described in Schedule 5.

3.9 Where less than 3% of the subdivisible area has natural assets worth conserving, the maximum shall be retained.

3.10 Subject to nature POS being accessible by the public in accordance with Schedule 2 (including fenced areas with controlled access), the City will accept the inclusion of nature POS as unrestricted POS.

3.11 Approval of the City of Wanneroo and the Department of Education is required where nature POS is co-located with schools.

3.12 Consultation with the City of Wanneroo is required to determine the appropriate vesting order for Nature POS.

POS in Industrial Areas

3.13 POS shall be provided within industrial areas in accordance with Clause 3.14 of this Policy unless the City is satisfied that the following criteria are met:

- The industrial area is not of sufficient size to warrant POS provision;
- There is appropriate POS located within an 800m radius of the industrial area that can provide an opportunity for recreation; and
- Stormwater can be appropriately treated without using POS to serve a drainage function.

3.14 POS in industrial areas shall constitute between 2% and 5% of the gross subdivisible area. The City will accept 2% provided sufficient area is provided to accommodate the following:

- provide an opportunity for unstructured recreation during working hours (lunch breaks etc.) and to improve amenity within a built environment;
- be located where walkable catchment can be maximised and of appropriate size to provide an area protected where possible from the impacts of surrounding industry;
- contribute to improved stormwater quality through water sensitive urban design;
- act as a buffer to non-industrial land uses where necessary;
- retain natural assets where possible; and
- seek to activate for recreation those environmental assets already ceded for ongoing management.

Community Purpose Sites

3.15 Unless otherwise provided for by Clause 3.16 of this Policy, the City, when providing feedback to the WAPC on the matter, will advise that it does not support the inclusion of community purpose sites as part of the POS allocation and that their provision shall be subject to discussion and negotiation with the City of Wanneroo, unless otherwise determined.

3.16 The inclusion of community purpose sites as part of the POS contribution may be acceptable subject to:

3.16.1 The community purpose site being located adjacent to another parcel of POS and a function of the community purpose site relating to that POS (e.g. a community centre with facilities to support the sporting use of the POS);

3.16.2 A need being identified by a community development plan or other community needs study;

3.16.3 The allocation being subject to the provision requirements of restricted open space (See Clauses 2.7 – 2.9); and

3.16.4 Discussion and approval of the City of Wanneroo

3.17 Where community facilities are located on POS (e.g. a sporting pavilion), the space required to accommodate the facility should be considered as part of the POS planning process and included as part of the POS allocation. A specific community purpose site is not required in these instances.

4. Location of POS

4.1 Individual POS shall form part of an interconnected network of spaces for the purposes of encouraging pedestrian movement, ecological connectivity and improving public amenity.

4.2 POS shall be located to maximize accessibility and safety for the community in accordance with Crime Prevention Through Environmental Design (CPTED) principles:

- Civic spaces, parks, plazas, footpaths, urban streets and other shared community spaces that connect the buildings of the community must be located, designed and managed in ways that encourage its legitimate use and hence its security;
- The interface of public open space with the buildings/boundaries that define and adjoin it must be located, designed and managed to promote informal surveillance and use.

Co-location of POS with School Sites

4.3 Co-location of POS with school sites is supported and encouraged in the interest of optimising joint use and management, rationalising water use and creating community hubs. Co-location shall be investigated (but not assumed) at each site and is subject to:

- Creation of a larger, more multipurpose recreation or community precinct as a result of the co-location;
- The final precinct being able to accommodate:
    - a senior size playing field (recommended 185 x 155 = 2.87ha including 4m safety buffer);
    - adequate buffers to roads or other infrastructure (in addition to the 4m safety buffer around the boundary line)
    - the impact of a sloping site (through additional buffers or appropriate site treatment);
    - appropriate carparking and/or future changeroom facilities of an appropriate size; and
    - space for unstructured activity to occur at the same time as structured sport.

- A formal agreement between the City of Wanneroo, Department of Lands and Department of Education.

4.4 The City's preference is for co-location to occur. However, where multiple school sites are co-located and Sport POS is adequately provided for in a development area, the City will support playing fields within standalone primary school sites.

5. Design of POS

5.1 POS shall be designed to:

- Maximise environmental sustainability;
- Be of an acceptable size (refer Schedule 2) and shape to cater for its intended purpose;
- Retain natural ground levels where possible to suit the intended function of the POS;
- Be accessible via the walking and cycling network;
- Ensure universal access is provided to play areas, park furniture and park facilities;
- Reflect best practice in water conservation, harvesting, re-use and irrigation;
- Include initiatives to minimise energy use (through design, product selection, alternative energy sources etc.);
- Implement the function/s (sport, nature, recreation) identified for the site as part of an approved POS plan;
- Where possible, use locally indicative species and local building styles to preserve local heritage and landscape character;
- Make use of local resources and materials that are robust, recycled/recyclable, and environmentally sound;
- Incorporate sufficient safety, lighting and surveillance measures in accordance with the Designing Out Crime Guidelines (WAPC, 2006); and
- Where possible, provide incidental play opportunities through incorporation of landscape elements, in addition to designated play areas.

5.2 The City will approve areas of irrigated turf in POS where it:

5.2.1 Has a valid licence to take water issued by the Department of Water or has applied for a licence to take water and confirmed that sufficient water is available from the groundwater resource, unless an alternative water source is proposed. The licence to take water should be in accordance with the City of Wanneroo and Department of Water's North West Corridor Water Supply Strategy requirements;

5.2.2 Serves a functional purpose. Priority will be given to sports playing fields, followed by recreational areas. i.e. kick-about or picnic areas, followed by lower priority POS functions;

5.2.3 Has a maximum slope of 1:6; and

5.2.4 Is of an approved species (the City's preferred turf species is Pennisetum Clandestinum (Kikuyu)).

5.3 The City will approve trials of unirrigated turf in POS where the developer enters into an agreement with the City to replace the turf at their own cost and maintain for a 2 year period should the trial fail prior to handover to the City after the 2 year maintenance period.

5.4 Retention of natural bushland within POS shall be maximised where appropriate. Where this is not possible, priority shall be given to transplanting vegetation, landscaping with mature species, or use of local native species.

Sport POS Design

5.5 To ensure maximum potential for Sport POS to accommodate a full variety of recreational activity, Sport POS shall be designed generally in accordance with the development models illustrated at Schedule 4. Appropriate space shall be provided for:

- formal playing fields;
- athletics infrastructure (e.g. throwing circles, jump pits);
- buffers to roads and other infrastructure;
- unstructured recreation areas; and
- pavilions, carparks and other sporting infrastructure (e.g. cricket nets, batting cages, baseball backnets etc.).
- retention of native vegetation in 'good' or better condition, where possible; and
- significant tree retention, where possible.

These uses shall be reflected in the POS landscape plans at the appropriate stage of planning. Applicants shall refer to *Sports Dimensions Guide For Playing Areas – Sport and Recreation Facilities (Department of Sport and Recreation, July 2008)* for relevant sporting design criteria.

5.6 The playing field component of Sport POS sites shall:

5.6.1 be of uniform shape, with preference given to square or rectangular;

5.6.2 be graded (either naturally or through development) to allow for surface water runoff/drainage, with a slope of no greater than 1:200;

5.6.3 have access to a water supply and water licence transferable to the City of Wanneroo, suitable for the irrigation of an appropriate amount of turf and landscaping;

5.6.4 be free of the following constraints (either naturally or through development):

- Easements & buffers (pipe line, power line, incompatible land use);
- Wetland / water courses;
- Significant historical sites – either Indigenous or European, which will prevent the development of the site for the proposed function;
- Any transport or other feature that intersects the site or detracts from its development potential; and

- Soil contamination

6. Urban Water Management within POS

6.1 The inclusion of drainage management areas (retention/detention) within POS is supported in accordance with water sensitive urban design principles subject to Clauses 6.2 – 6.6 below.

6.2 The City will accept a drainage management area in POS for minor rainfall events that contribute to the unrestricted POS liability where it is designed to the following standards:

- Stormwater runoff from constructed impervious surfaces generated by up to a 15mm rainfall depth has been managed at the runoff source or in a separate water quality treatment infrastructure located in the POS before the minor rainfall event runoff enters the drainage management area;
- Stormwater flows are managed to prevent adverse impact on the built and natural environment within POS;
- The drainage management area is sized and designed to ensure water is not present more than 1.5 days after any one rainfall event;
- The drainage management area is accessible to the public;
- Areas in the immediate vicinity of piped drainage outlets are landscaped to restrict public access;
- The drainage management area is landscaped and integrated into overall POS design;
- Landscaping gradient below top water level does not exceed 1:6:
- Depth of water in the drainage management area shall not exceed a maximum of 900mm at any one time;
- Retaining walls located within the drainage management area are visible above the maximum water level specified above at all times; and
- Where retaining walls are used, opportunities are provided for safe egress in the event of the drainage management area filling up with stormwater.

6.3 The City will accept a drainage management area in POS for a major rainfall events where it is designed to the following standards:

- Stormwater flows are managed to prevent adverse impact on the built and natural environment within the POS;
- The drainage management area is sized and designed appropriately to ensure water is not present for more than 3.5 days after any one rainfall event;
- The drainage management area is accessible to the public;
- The drainage management area is landscaped and integrated into overall POS design;
- Landscaping gradient below top water level does not exceed 1:6;
- Depth of water in the drainage management area does not exceed a maximum of 1200mm at any one time;
- Retaining walls located within the drainage management area shall be visible above the maximum water level specified above at all times; and
- Where retaining walls are used, opportunities are provided for safe egress in the event of the area filling up with stormwater.

6.4 The City will consider a proposal for a minor or major rainfall event drainage management area in POS that varies the standards listed in Clauses 6.2 and 6.3 where it satisfies all of the following criteria:

- The risk to public health and safety is managed to an acceptable level;
- The proposal is based on sound engineering practice;
- The drainage management area will be able to be maintained by the City;
- The environment will not be adversely impacted; and
- The proposal will not detrimentally affect the amenity of the proposed reserve.

6.5 All stormwater drainage generated by a subdivision shall be contained within the subdivisional area. However, the City will consider proposals for drainage to be directed into pre-existing POS drainage reserves outside the subdivision area where they satisfy the following criteria:

- The proposal does not negatively impact on the intended function of the existing reserve. Where the function of the reserve is affected, there must be sufficient POS available in the locality to compensate for the impact of the additional drainage function proposed;
- The need to include drainage in the existing reserve arises as a necessary result of a practical and efficient drainage system design from an engineering perspective;
- There is sufficient existing capacity in the relevant infrastructure;
- That the proposal is consistent with the Management Order for the land;
- The drainage infrastructure within the existing reserve meets the requirements for public safety, public use, and extent of inundation stated in Clause 6.2 - 6.3;
- The City is satisfied that existing community usage of the reserve is maintained; and
- The ecological values of the reserve are maintained or enhanced.

In considering proposals under Clause 6.5, the City may consult with residents within the catchment (see Schedule 2 for appropriate catchment) of the existing reserve.

6.6 The City will not accept the following drainage outcomes in POS:

- Stormwater runoff from small rainfall events entering any part of a POS reserve that is included in the POS credit calculation;
- Stormwater drainage management infrastructure within Nature POS;
- Constructed waterbodies (e.g. ornamental lakes) unless approved by the City as part of best practice water management; or
- Stormwater runoff from small rainfall events being directed into wetland buffers.

7. Development of POS

7.1 Where a subdivision application proposes the creation of POS, the City shall in its response to the WAPC, request that a condition be imposed requiring the applicant to develop the open space to the Standard Requirement detailed in Schedule 2 of this Policy.

7.2 The City will consider a proposal to vary the standard requirement where it meets one of the following pre-conditions:

- The proposal varies the provision of infrastructure for individual parcels of POS within a developable area but does not exceed the aggregate standard requirement across the developable area;
- There is a demonstrable increased demand for additional infrastructure due to a high density of residential dwellings being proposed within the walkable catchment of the POS (refer Schedule 2) that is supported by a cost-benefit analysis provided by the developer;
- Where an agreement is entered into with the City for the Developer to pre-fund the cost to maintain and replace the proposed asset for two life cycles of the proposed asset; or
- The proposal varies the provision of infrastructure for POS that due its location (i.e. forms part of a coastal node, co-located with community purpose sites, or within a town centre) serves the catchment of a higher order POS in accordance with Schedule 2.

7.3 In assessing a proposal to vary the standard requirement under Clause 7.2, the City will consider the following criteria:

- The proposed asset will be located within an appropriate catchment area;
- The proposed asset is unlikely to impact the existing or proposed surrounding development through additional noise or additional traffic generated;
- The catchment area does not already have access to POS with similar assets;
- There are appropriate supporting facilities for the proposed asset where necessary (i.e. parking, toilets);
- There is an equal spread of assets proposed within the developable area; and
- The proposed asset satisfies the City's safety requirements

7.4 No clearing of vegetation or other works shall occur within an area of open space or road reserve until the City of Wanneroo has granted approval for the subdivisional working drawings and associated landscaping plans.

7.5 In accordance with Clause 7.1 (above), any works associated with those defined in Schedule 2 shall be considered to be subdivisional works and therefore exempt from requiring a separate planning approval under the scheme, unless it is considered by the Manager, Planning Implementation that the nature of the development:

- cannot reasonably be considered as 'subdivisional works';
- is potentially controversial;
- has the potential to significantly impact on the amenity of nearby residents; or
- requires detailed assessment, consideration and the implementation of management conditions of a statutory nature.

7.6 In the absence of a valid subdivisional approval issued by the Western Australian Planning Commission, or where the works are not listed in Schedule 2, planning approval may be required in accordance with Part 6 of the City of Wanneroo District Planning Scheme Number 2.

7.7 The City may require landscaping works as conditioned by the WAPC to be either completed or bonded prior to clearance of the relevant WAPC conditions.

Playgrounds

7.8 The City will accept a proposal for a playground in POS that satisfies the following criteria:

- The size and scale of play equipment items are consistent with the items identified for the relevant type of POS in Schedule 3;
- The playground does not exceed the total number of items allowed as the Standard Requirement in Schedule 2;
- The playground provides opportunities for physical and creative play;
- The playground accommodates different age groups;
- The playground complies with the City's safety requirements;
- Whole-of-life costs for play equipment items have been approved by the City; and
- An asset management plan for play equipment items in accordance with ISO55001 standard has been approved by the City.

7.9 Playgrounds proposed in parks that are identified as neighbourhood POS or above must make provision for the inclusion of universal access play equipment.

Barbeques

7.10 A barbeque may be provided in accordance with Schedule 2. A proposal for a barbeque in POS designated as Neighbourhood Recreation must satisfy the following:

- There are no barbeques (existing or proposed) located in POS within a 400 metre walkable catchment; and
- There are no major barriers preventing access to the POS.

8. Maintenance and Handover of POS

8.1 The City will accept handover of POS after two years from practical completion, subject to the following:

8.1.1 the City being satisfied that the maturity of vegetation, density of planting, species selection and standard of infrastructure are consistent with that specified in the landscaping plan approved by the City, as being acceptable for handover to the City;

8.1.2 for at least 12 consecutive months prior to handover, the developer maintaining the POS to the same standard[1] as it would otherwise be maintained by the City post-handover, including the tapering-off of vegetation from irrigation to ensure long-term survival;

[1] The standard acceptable to the City at handover shall be specified in the landscape plans lodged as a condition of subdivision and subsequently agreed by the City at the time of approving the landscape plans for the POS.

8.1.3 the developer providing the City with annual metered bore water usage data for any irrigated POS during the term of their maintenance period, to demonstrate compliance with the water licence allocation for that area;

8.1.4 the developer providing the City with as-constructed drawings and asset management data for the POS and any facilities/infrastructure contained therein;

8.1.5 where there are outstanding conditions imposed under the *Environmental Protection and Biodiversity Conservation Act 1999* that require ongoing maintenance of any component of the POS, the developer is to enter into an agreement with the City for access to the site for maintenance purposes; and

8.1.6 the developer engaging an independent playground auditor to undertake a risk assessment audit of playgrounds or play areas and undertaking any remedial work required as a consequence, where in the City's opinion the playground or play area does not fall within the Australian Standards:

8.2 Should the conditions of Clause 8.1 not be met, the maintenance period will be reviewed and an additional period of developer maintenance may be required until such time as the conditions detailed in clause 8.1 have been met to the satisfaction of the City.

8.3 The City will not accept handover of POS during the months of November to March (inclusive). Where necessary, the developer maintenance term shall be extended to avoid handover dates during this period.

8.4 Should handover extend beyond the 2 year maintenance period, the developer shall provide an indicative date of handover to the City prior to the end of the 2 year maintenance period.

9. Consultation

9.1 Applicants shall consult with the City of Wanneroo regarding the planning and development of POS at all stages of the planning process to ensure that it meets the needs of the City of Wanneroo and the community in the long term.

9.2 Where possible, applicants shall show evidence of consultation with end-users (the community) in developing landscape plans for the development of POS. Outcomes of the consultation shall be balanced against known design principles in the design process for the POS.

Definitions

Sport open space means land for which the primary function is organised, high intensity sporting use.

Developable Area means all of the land within a subdivision, or a structure plan if the subdivision falls within one.

Gross Sub-divisible Area means the land available for subdivision excluding areas for non-residential uses determined by the WAPC such as schools, shopping centres, infrastructure, dedicated drainage sites (small rainfall event drainage management areas), community facilities or land set aside for arterial roads.

Major rainfall event means events greater than the minor rainfall event and up to and including the 1% annual exceedance probability (100 year critical ARI event).

Minor rainfall event means events greater than the small rainfall event and up to and including the 20% annual exceedance probability event (5 year critical ARI event) for residential areas and the 10% annual exceedance probability event (10 year critical ARI event) for commercial and industrial areas as well as arterial roads.

Nature Play means a space containing natural materials that encourages child-led play, moderated risk taking, decision making, creativity and collaborative play while providing opportunities to connect to nature in a way that is relevant to the site

Nature open space means land for which the primary function is the retention and ongoing management of indigenous flora and fauna. These sites may be modified from their original condition in line with best practice environmental management and to facilitate public access for recreational purposes.
Overprovision means the provision of assets within a local structure plan or subdivision area that is in excess of the standard requirement under Schedule 2.

Recreation open space means land for which the primary function is unstructured recreational pursuits (picnics, children's play, dog walking) or low intensity active recreation (jogging, walking, casual kick-about).

Public open space **(POS)** means land used or intended for use for recreational purposes by the public and includes parks, public gardens, playgrounds and sports fields but does not include regional open space and foreshore reserves (Liveable Neighbourhoods 2007).

Restricted public open space means those spaces that are constrained in a way that restricts the use of the space for recreational purposes by the general public (e.g. wetlands, certain drainage swales, power easements, cultural heritage sites, significant topographical features).

Small rainfall event means events up to and including the 1 exceedance per year event which require runoff management for up to 15mm rainfall depth from constructed impervious areas, other than roofs which require management for up to 10mm rainfall depth in the City of Wanneroo.

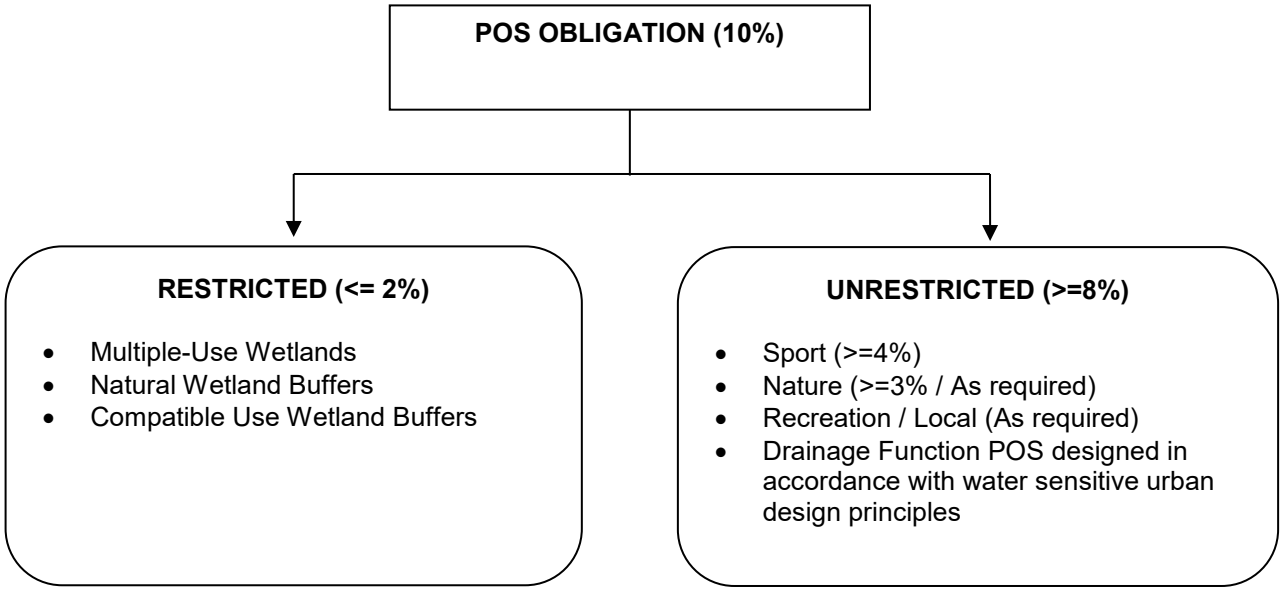
Unrestricted public open space means those spaces that are free from constraints or encumbrances (e.g. wetlands, easements, cultural heritage sites, significant topographical features) and are available at all times for recreational purposes by the general public. This includes conservation areas that are accessible by the public.

Schedule 1

POS CATEGORIES

POS PROPOSAL	POS CATEGORY	CREDIT	CONDITIONS / COMMENTS
Sport / Recreation POS			
• Sport POS	Unrestricted	100%	Refer to Clause 5.6
• Unconstrained Local / Recreation POS	Unrestricted	100%	
Nature POS			
• Natural assets	Unrestricted	100%	Refer to Clauses 3.7 – 3.9
• Inaccessible natural assets	N/A	0%	Refer to Schedule 2 – Conservation – Unacceptable Criteria
Wetlands and Buffers			
• Conservation category wetlands *(Refer LPP 4.1: Wetlands for wetland definitions)*	N/A	0%	Not accepted as POS. Considered to be a deduction from the gross subdivisible area
• Resource Enhancement category wetlands	N/A	0%	Not accepted as POS. Considered to be a deduction from the gross subdivisible area
• Multiple-use wetlands	Restricted	100% (up to ⅕ of POS allocation)	Must form part of a stormwater management strategy
• Natural wetland buffers *(i.e. buffers in a natural state)*	Restricted	100% (up to ⅕ of POS allocation)	Management plans must be developed to demonstrate management of the wetland and buffer for conservation purposes
• Compatible-use wetland buffers *(i.e. buffers where vegetation is degraded or completely degraded, permitting low impact uses)*	Restricted	100% (up to ⅕ of POS allocation)	• Must demonstrate the protection of the ecological values of the wetland and wetland buffer; • Development of a concept plan to demonstrate appropriate recreational use of the area; and • City of Wanneroo approval.
Urban Water Management			
• Stormwater management systems to manage small rainfall event runoff piped directly from lots and road reserves	N/A	0%	Not accepted as POS. Considered to be a deduction from the gross subdivisible area
• Minor rainfall event drainage management area	Unrestricted	100% (up to ⅕ of POS allocation)	Unrestricted subject to Clause 6.2
• Major rainfall event drainage management area	Unrestricted	100%	Refer to Clause 6.3
• Constructed permanent water body performing a drainage	N/A	0%	Not accepted as POS

function			
• Artificial lined water body	N/A	0%	Not accepted as POS
Other			
• Entry Statements (where not a component of a larger usable area)	N/A	0%	• Not accepted as POS. • Entry statements are not considered useable space by the community



Schedule 2

PUBLIC OPEN SPACE HIERARCHY – CITY OF WANNEROO

TYPE	DESCRIPTION & PURPOSE	ACCEPTABLE SIZE	WALKABLE DISTANCE [1]	OTHER CRITERIA	UNACCEPTABLE CRITERIA	STANDARD REQUIREMENT
POCKET PARK	Pocket parks are small parcels of POS provided within a neighbourhood that primarily serve an amenity and recreation function, although they are sometimes too small to function effectively as a recreation open space. They may also serve valuable functions as community meeting places or places for relaxation. They often specifically exist to retain significant vegetation or cultural and physical landmarks.	<5000sqm	N/A	• Located throughout neighbourhoods • Low maintenance • May be a smaller space within a town or city centre that serves a social or recreational function. • May incorporate significant trees or other vegetation • May incorporate drainage infrastructure • May be provided to improve accessibility to POS in areas where larger spaces are not feasible. • May play a connectivity role as part of a linear POS network	• Pocket parks proposed at the expense of the appropriate provision of other POS types in the hierarchy (as determined by the City).	• 2 x Benches/Seating • 2 x Play equipment items or nature play with sand or mulch soft fall where applicable (refer Clauses 7.8 – 7.9 of this Policy) • Shade over play area[4] • Park sign wall with signage panel and plate as per City of Wanneroo signage style guide • Internal circulation paths • Access required for maintenance vehicles, service vehicles and emergency vehicles • Earthworks and retaining as required • Full landscaping (with native revegetation, water wise planting and tree planting) • Hydrozoned Irrigation w/ bore licence to be provided in accordance with Schedule 6 • Tree/bush retention where possible
LOCAL	Service the regular small-scale recreation needs of the immediate surrounding population (e.g. dog walking, children's play, relaxation). They provide opportunity to reflect local character and sense of place through retention of significant trees, cultural and physical landmarks. They often play a drainage function as part of an urban water management strategy.	5000sqm – 1.0 ha	Max 400m (5min walk)	• Located on pedestrian network to maximise access. • Located throughout neighbourhoods. • Located adjacent to residences to maximise passive surveillance. • May play a connectivity role as part of a linear POS network	• POS parcels where the principal purpose is an Entry Statement to a housing estate.	• 3 x Benches/seating • 4 x Play equipment items or nature play with sand or mulch soft fall (refer Clauses 7.8 – 7.9 of this Policy) • Shade over play area[4] • 1 x Picnic setting with picnic shelter • Bin(/s) (dependant on size) • Internal circulation paths • Park sign wall with signage panel and plate as per City of Wanneroo signage style guide • Access required for maintenance vehicles, service vehicles and e mergency vehicles • Earthworks and retaining as required • Full landscaping (with native revegetation, water wise planting and tree planting) • Hydrozoned irrigation w/ bore licence to be provided in accordance with Schedule 6 • Tree/bush retention where possible
NEIGHBOURHOOD	Are similar to local spaces but are generally larger and able to provide for recreation and informal active pursuits simultaneously. They are more of a destination for the local community and may incorporate accessible remnant bushland or conservation areas. Neighbourhood spaces may serve a recreational, sports or nature function. POS incorporating a single playing field is considered to be a Neighbourhood space under this Policy.	1.0 – 7.0ha (Recreation) 4.0 – 7.0ha (Sports)	Max 800m (10min walk)	• Located central to the catchment[2] to maximise accessibility. • Located adjacent to residences to maximise passive surveillance. • May be collocated with primary school facilities to upgrade school playing field to senior capacity or create a community hub. • Designed generally in accordance with *Schedule 4*	• POS sites of less than 3.0ha co-located with primary schools.	<u>Neighbourhood Recreation</u> • 6 x Benches/Seating • 6 x Play equipment items or nature play with sand or mulch soft fall (refer Clauses 7.8 – 7.9 of this Policy) • Shade over play area[4] • 2 x Picnic settings with picnic shelters • 1 x Barbeque *(optional, subject to clause 7.10)* • 1 x Drinking fountain • Bin(/s) (dependant on size) • Internal circulation paths • Pedestrian/cycle paths (external) • Bike rack • Security Lighting

						• Bollards as required • Park sign wall with signage panel and plate as per City of Wanneroo signage style guide • Access required for maintenance vehicles, service vehicles and emergency vehicles • Earthworks and retaining as required • Full landscaping (with native revegetation, water wise planting and tree planting) • Hydrozoned Irrigation w/ bore licence to be provided in accordance with Schedule 6 • Tree/bush retention where possible <u>Neighbourhood Sports</u> • 6 x Benches/seating • Designated play area • 6 x Play equipment items or nature play with sand or mulch soft fall (refer Clauses 7.8 – 7.9 of this Policy) • Shade over play area[4] • 4 x Picnic settings with picnic shelters • 2 x Drinking fountains • 1 x Barbeque • 4 x Fitness equipment units • Multi-use half court • Cricket practice pitch • Cricket pitch • Goals (dependant on use) • Bin(s) (dependant on size) • Multipurpose senior sports oval (as per Clause 4.5) • Sport amenities building (change room, toilets, kiosk) • Security Lighting • Internal circulation paths • Pedestrian / cycle paths (external) • Bike rack/s • Car parking • Earthworks and retaining as required • Full landscaping (with native revegetation, water wise planting and tree planting) • Hydrozoned irrigation w/ bore licence to be provided in accordance with Schedule 6 • Bollards • Access required for maintenance vehicles, service vehicles and emergency vehicles • Park sign wall with signage panel and plate as per City of Wanneroo signage style guide • Tree/bush retention where possible
DISTRICT	Principally provide for organised sporting use, yet are large enough to accommodate a variety of concurrent uses including informal recreation, children's play, picnicking, dog walking, social gatherings and individual activities. District open space may also serve conservation and environmental management	7.0 – 20ha	N/A (Unless serving a local or neighbourhood function, where the appropriate catchment shall	• May be co-located with High Schools to create district community hub. • Should be located close to major roads and other community facilities; • Should be easily accessible by pedestrians, cyclists and motor vehicles. • Designed generally in accordance with	• Sites adjacent or in close proximity to residences should be avoided or appropriate buffers provided so as to minimise impact of noise, traffic and light spill.	• 8 x Benches/seating • 8 x Play equipment items or nature play with sand or mulch soft fall (refer Clauses 7.8 – 7.9 of this Policy) • Shade over play area[4] • 6 x Picnic settings with picnic shelters

	goals and can include areas of undeveloped land with natural/native vegetation and wetlands. Often include higher order recreation infrastructure (clubrooms, floodlights, multipurpose courts etc.)		apply)	*Schedule 4*		• 2 x Drinking fountains • 2 x Barbeques • 4 x Fitness equipment units • Basketball half courtBin(s) (dependant on size) • 4 x Goals (dependant on use) • 2 x Cricket practice pitch • 2 x Cricket pitch • 2 x Multipurpose hard courts • 2 x Multipurpose senior sports ovals (as per Clause 4.5) • Pedestrian / cycle paths (external) • Internal circulation paths • Bike rack/s • Bollards • Access required for maintenance vehicles, service vehicles and emergency vehicles • Car Parking • Toilets and Change rooms • Security Lighting • Full landscaping (with native revegetation, water wise planting and tree planting) • Hydrozoned irrigation w/ bore licence to be provided in accordance with Schedule 6 • Park sign wall with signage panel and plate as per City of Wanneroo signage style guide • Tree/bush retention where possible
REGIONAL[3]	Regional Open Spaces are generally the largest provisions of space in the community. They are the focal points for community activity and/or active sport and are capable of intense, frequent use by large numbers of people. Regional spaces attract visitors from across the metropolitan area and are not restricted to any one local government area. May be a: • large scale sporting complex with multiple precincts (e.g. Kingsway Regional Sporting Complex), • community destination that attracts large numbers of visitors (regional beach node, Yanchep activity node) • conservation precinct (see *Schedule 4*) Regional spaces are generally allocated outside the structure planning process by the WAPC in partnership with Local Government.	20-50+ ha	N/A (Unless serving a local or neighbourhood function, where the appropriate catchment shall apply)	• Should be accessible by public transport routes and major access roads. • Should be located such that the impact on residents is able to be minimised, especially noise, traffic and light spill. • Should be located such that it minimises negative impact on the surrounding environment – both built and natural. • Access and management of water both on and off site is critical. • Site constraints should be minimised (e.g. topography, culturally significant sites, significant clearing) to ensure economic viability.	• Sites adjacent or in close proximity to residences should be avoided or appropriate buffers provided so as to minimise impact of noise, traffic and light spill.	Not applicable.

NATURE	Nature spaces can provide settings for the community to access and enjoy nature, and protect local biodiversity. They may include bushland, coastal areas and wetlands. Sites are managed to enable recreational access while protecting local ecological and biodiversity values.	Size of nature POS is impacted by viability assessment in Schedule 5.	N/A	• May be co-located with sports/recreation POS. • Shall be accessible by the community for recreational use (may be achieved through controlled access to walk trails through the site, or the co-location of natural areas with developed sports and/or recreation open space to provide an activated interface with natural areas (Refer to Schedule 4 for example concept).	• Restricted access conservation areas (i.e. fenced off from the public with no controlled access)	• No earthworks except where it pertains to grading for universally accessible trails • Weed control management strategy • Tree/bush retention • 3m wide vehicle access gates for maintenance, service and emergency vehicles (includes fire access) • Cement stabilised limestone trail surfacing • Benches/Seating (off access track on concrete pad) • Directional or Interpretative signage • Pedestrian access control gates (where appropriate) • Conservation fencing • Development and implementation of a management plan[5] • Park sign wall with signage panel and play as per City of Wanneroo signage style guide

1. Walkable distance means the maximum desirable distance that the nominated POS type should be located from dwellings.
2. Catchment means the residential area serviced by the walkable distance of the nominated POS type.
3. Although the provision of Regional POS is outside the scope of this policy, it is included in the hierarchy for context, as all classifications are related and the use of one POS type is directly influenced by the other and vice versa.
4. The City's preference is for tree planting as primary shade provider for playgrounds and picnic areas; however the City requires the installation of a shade sail until such time as tree shade is adequate.
5. Development and implementation of a management plan to provide for environmental restoration, protection and maintenance, and activation of the POS for a recreational use and maintenance of ecological function.

Schedule 3

PLAY EQUIPMENT ITEMS

This table is to be read in conjunction with Clauses 7.8 and 7.9 of this Policy

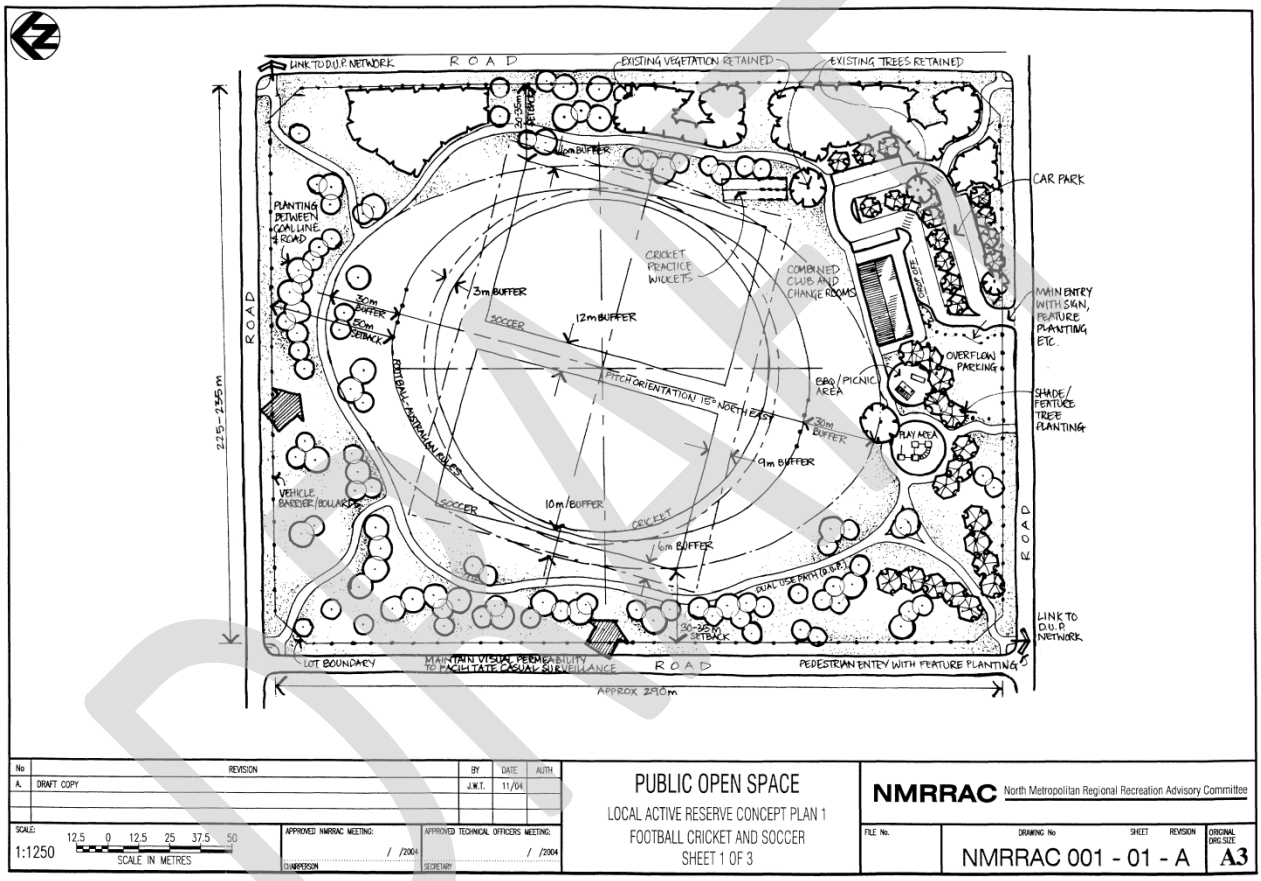
POS type (as per POS Hierarchy)	Appropriate size and scale of play equipment items*
Pocket Park	• 1 x Swing frame with one senior swing and one toddler swing (3m maximum height) • 1 x slide (1.5m maximum height)
Local Park	• 1 x Swing frame with one senior swing and one toddler swing (3m maximum height) • 1 x slide (1.8m maximum height) • 1 x small combination unit (16m^2 maximum footprint, 3.5m maximum height) • 1 x rocker (one spring)
Neighbourhood Recreation	• 1 x Swing frame with two senior swings (3.5m maximum height) • 1 x birds nest swing (3.5m maximum height) • 1 x medium combination unit (40m^2 maximum footprint, 3.8m maximum height) • 1 x small rope pyramid (40m^2 maximum footprint) • 1 x slide (2.5m maximum height) • 1 x rocker (two springs)
Neighbourhood Sport	• 1 x Swing frame with two senior swings (3.5m maximum height) • 1 x birds nest swing (5.5m maximum height) • 1 x large combination unit (60m^2 maximum footprint, 3.8m maximum height) • 1 x small rope pyramid (40m^2 maximum footprint) • 1 x slide (2.5m maximum height) • 1 x rocker (four springs)
District	• 1 x Swing frame with two senior swings (3.5m maximum height) • 1 x birds nest swing (5.5m maximum height) • 1 x large combination unit (60m^2 maximum footprint, 3.8m maximum height) • 1 x medium combination unit (40m^2 maximum footprint, 3.8m maximum height) • 1 x small rope pyramid (40m^2 maximum footprint) • 1 x slide (2.5m maximum height) • 1 x rocker (four springs) • 1 x rocker (four springs)

*The maximum footprint of an item is calculated as the item's length x width (does not include soft fall)

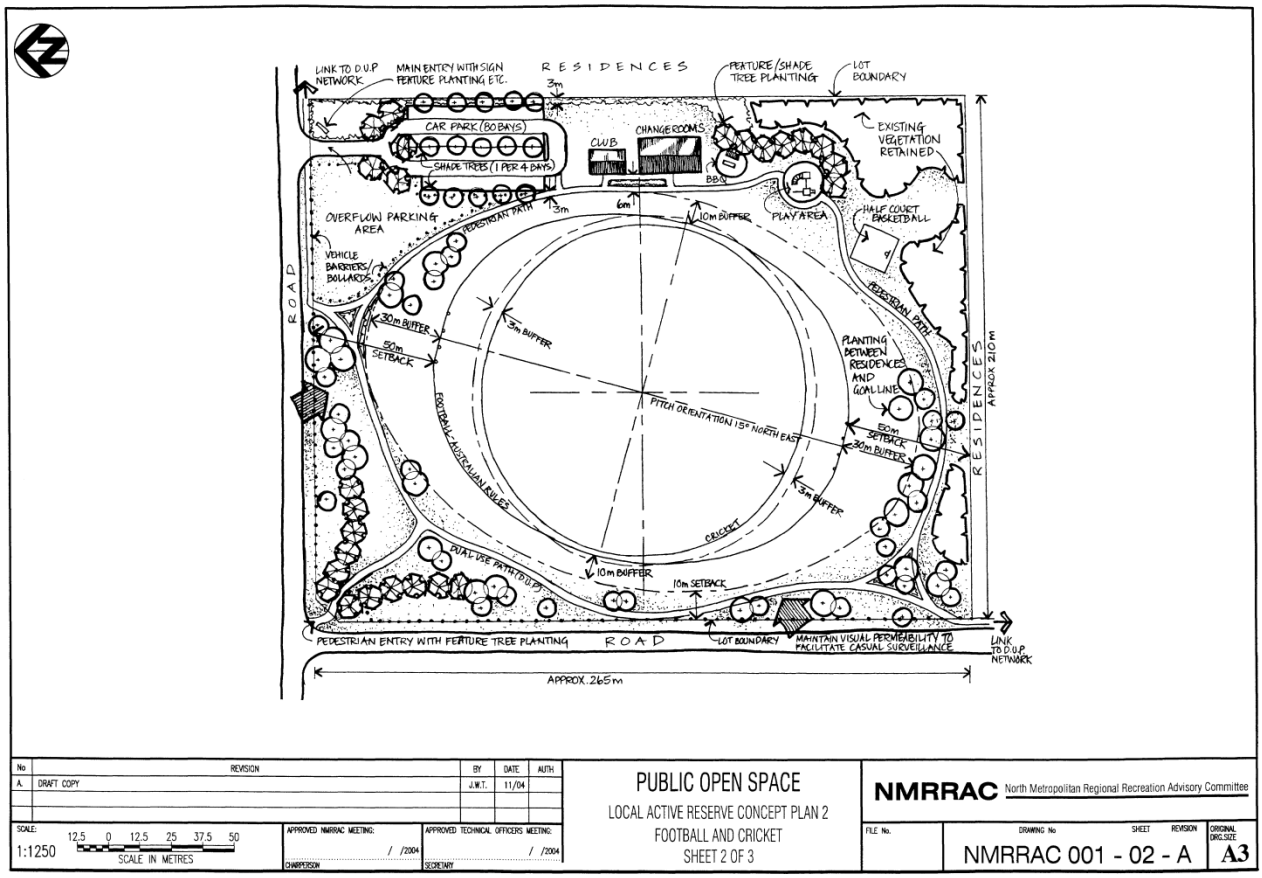
Schedule 4

EXAMPLE PUBLIC OPEN SPACE CONCEPT PLANS

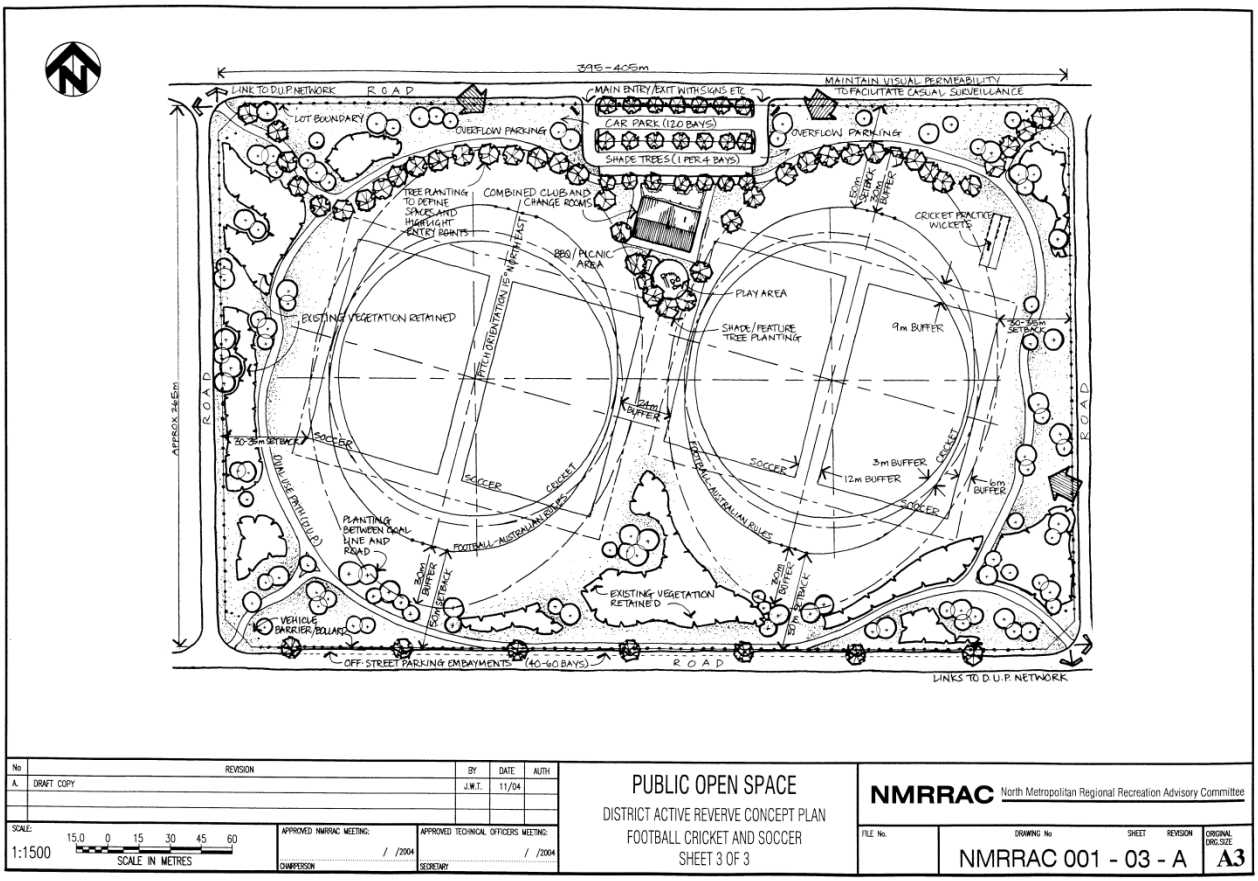
MODEL TEMPLATE –Neighbourhood Sport Open Space (Multipurpose)



MODEL TEMPLATE – Neighbourhood Sport Open Space (Football/Cricket)



MODEL TEMPLATE –District Sport Open Space



MODEL TEMPLATE – Nature Open Space

Schedule 5

VIABILITY ASSESSMENT TABLE

Adapted from: *Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region* (del Marco *et al*, 2004).

POS areas identified for retention for the purpose of conservation will be expected to be viable to ensure long-term survival and reduce ongoing maintenance costs. Viability shall be determined using the following table. A minimum score of 14 is required for a conservation POS area to be considered to be viable.

Viability Factor	Category	Score
Size	Greater than 20ha	5
	Greater than 10ha less than 20ha	4
	Greater than 4ha less than 10ha	3
	Less than 4ha	2
	Less than 1ha	1
Shape	Circle, square or squat rectangle	3.5
	Oval, rectangle or symmetrical triangle	3
	Irregular shape with few indentations	2.5
	Irregular shape with many indentations	2
	Long thin shape with large proportion of area greater than 50 m wide	1.5
	Long thin shape with large proportion of area less than 50 m wide	1
Perimeter to Area Ratio	Less than 0.01	4
	Greater than 0.01 less than 0.02	3
	Greater than 0.02 less than 0.04	2
	Greater than 0.04	1
Vegetation Condition	Pristine 10 x % =	
	Excellent 8 x % =	
	Very Good 6 x % =	
	Good 4 x % =	
	Degraded 0 x % =	
	Completely Degraded 0 x % =	
	Total Calculated Score	
Connectivity	Forms part of a Regional Ecological Linkage* and is contiguous with a protected natural area** greater than 4ha	5
	Not part of a Regional Ecological Linkage but contiguous with a protected natural area greater than 4ha	4.5
	Forms part of a Regional Ecological Linkage and is within 500 m of more than 2 protected natural areas having an area greater than 4 ha	4
	Not part of a Regional Ecological Linkage but within 500 m of more than 2 protected natural areas having an area greater than 4 ha	3.5
	Forms part of a Local Ecological Linkage*** and is contiguous with a protected natural area greater than 4ha	3
	Not part of a Local Ecological Linkage but contiguous with a protected natural area greater than 4ha	2.5
	Forms part of a Local Ecological Linkage and is within 500 m of more than 2 protected natural area having an area greater than 4 ha	2
	Not part of a Local Ecological Linkage but within 500 m of more than 2 protected natural area having an area greater than 4 ha	1.5
	Forms part of a Regional or Local Ecological Linkage but is not within 500 m of any protected natural areas having an area greater than 4ha	1

* Regional Ecological Linkages are those defined by the Perth Biodiversity Project or the Gnangara Sustainability Strategy and are depicted by Figure 4 in the City's Local Biodiversity Strategy.
** Figure 5 of the City's Local Biodiversity Strategy defines protected natural areas.

*** Figure 4 in the City's Local Biodiversity Strategy depicts local Ecological Linkages, however, the formation of new local linkages in new development areas should be considered as part of local structure planning.

Schedule 6

IRRIGATION REQUIREMENTS

From the City of Wanneroo and Department of Water's North West Corridor Water Supply Strategy

To provide essential public parkland at maximum efficiency and ensure the orderly and equitable allocation of water, POS shall be irrigated in accordance with the design criteria in the table below and at a reduced average irrigation rate of 6,750 kL/ha/yr.

Design criteria		
Type of POS	**Description**	**Maximum % of site area that is permanently irrigated**
Sport	*Regional/ District playing fields	64%
	*Neighbourhood/local playing fields	59%
Recreation	Local/Recreation/Pocket parks	33% (assuming 3% of gross subdivisible area is passive POS)
	Schools/hospitals	30%
	Streetscapes/entry statements	0% (establishment only)
Nature		0% (establishment only)