

Digital 4 Pty Ltd Lot 802 and Part 803 Erindale Road, Hamersley

> Section 38 referral Supporting Document

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Table of Contents

Executive Summaryv				
1. Introduction			1	
	1.1	Purpose and scope1		
	1.2	Proponent1		
	1.3	Environ	nental impact assessment process	1
	1.4	Other ap	pprovals and regulation	2
		1.4.1	Environment Protection and Biodiversity Conservation Act 1999	2
2.	The p	proposal		7
	2.1	Backgro	und and justification	7
	2.2	Proposa	l description	7
		2.2.1	Key proposal characteristics	7
	2.3	Local an	d regional context	8
3	Stake	holder er	ngagement	12
5.	3.1	Kev stak	eholders	12
	3.2	Stakeho	Ider engagement process	
	0.2	3.2.1	Community consultation	
		3.2.2	Regulatory consultation	
	3.3	Stakeho	Ider consultation	12
		3.3.1	Community consultation	12
		3.3.2	Agency consultation	14
Л	Envir	onmental	principles and factors	16
ч.	<u> </u>	Principle		.16
	4.1 4.2	Key Envi	ronmental Factor 1 – Flora and Vegetation	10
	7.2	4 2 1		10
		4.2.1	EPA policy and guidelines	10
		423	Receiving environment	10
		4.2.4	Potential impacts	
		4.2.5	Assessment of impacts	
		4.2.6	Mitigation	
		4.2.7	Predicted outcome	
	4.3	Kev Envi	ronmental Factor 2 – Terrestrial Fauna	34
		4.3.1	FPA objectives	34
		4.3.2	EPA policy and guidance	34
		4.3.3	Receiving environment	34
		4.3.4	Potential impacts	42
		4.3.5	Assessment of impacts	43



	4.3.6	Mitigation	44
	4.3.7	Predicted outcome	45
5.	Other environr	nental factors or matters	47
6.	Offsets		50
7.	Limitations		53
8.	References		54

List of Tables

Table ES.1: Proposal summary tablev
Table ES.2: Physical and operational elementsvi
Table ES.3: Summary of potential impacts, proposed mitigation and outcomesvi
Table 1.1: Proponent and key contact details1
Table 1.2: Other approvals2
Table 2.1: Summary of the proposal7
Table 2.2: Location and proposed extent of physical and operational elements
Table 3.1: Summary of agency consultation 14
Table 4.1: EP Act principles 16
Table 4.2: Southwest Vegetation Complex Statistics Report (2018) 19
Table 4.3: Vegetation types 22
Table 4.5: Area (ha) covered by each vegetation condition category within the development envelope
Table 4.6: Proposed areas to be cleared and partially cleared, by vegetation type29
Table 4.7: Proposed areas to be cleared and partially cleared by vegetation condition29
Table 4.8: Conservation significant fauna species likely to occur within the development envelope 34
Table 4.9: Definitions of Black Cockatoo foraging habitat quality37
Table 4.10: Vegetation types and Black Cockatoo foraging species within the development envelope
Table 4.11: Black Cockatoo habitat
Table 4.12: Proposed areas to be cleared and partially cleared, by black cockatoo habitatquality42
Table 5.1: Assessment of other environmental factors 47

List of Figures

Figure 1.1: Development envelope	4
Figure 1.2: Development envelope – physical elements	5
Figure 1.3: Current MRS and LPS zoning	6
Figure 2.1: Topography and soils	.10



Figure 2.2: Hydrology	.11
Figure 4.1: Vegetation types and Priority flora	.26
Figure 4.2: Vegetation condition	.27
Figure 4.3: Bush Forever areas and Ecological Linkages	.28
Figure 4.4: Black Cockatoo habitat	.40
Figure 4.5: Local and regional Black Cockatoo habitat	.41

Appendices

Appendix A	Concept Plan
Appendix B	Hamersley Project Community Consultation Report
Appendix C	Vegetation, flora and fauna report (Strategen 2018)
Appendix D	Schedule 1: Standards for Asset Protection Zones
Appendix E	Naturemap and Protected Matters database search results
Appendix F	Black Cockatoo nest hollow assessment (Strategen-JBS&G 2019)
Appendix G	Offset Strategy



Executive Summary

Digital 4 Pty Ltd (Digital 4; the Proponent) is proposing to rezone 179 (Lot 802) Erindale Road, Hamersley under the City of Stirling (CoS) Local Planning Scheme No. 3 (LPS No.3) from 'Local Reserve: Public Use Reserve (Commonwealth)' to 'Development Zone', to enable Urban/ Residential development.

To facilitate Urban development, clearing of vegetation will be required within Lot 802 and a portion of the western edge of Lot 803. While future development will be contained within Lot 802, the proposed area of clearing extends beyond Lot 802 into the adjacent lot (Lot 803; owned by BAI Communications) to include partial clearing for bushfire management (an asset protection zone [APZ]).

The 'development envelope' for the purpose of this referral includes the entirety of Lot 802 and the western part of Lot 803 as necessary for an APZ, as shown in Figure 1.1 and Figure 1.2. It is noted that clearing associated with the APZ will only be to the extent necessary to comply with APZ standards as per Schedule 1 of the *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2017). While this referral has allowed for a 22 m APZ along the entire eastern boundary of Lot 802, the location of the conservation area and public open space along (within) the eastern boundary of Lot 802, proposed by the current concept plan, would result in a reduction to the actual extent of clearing required for an APZ at these interfaces.

Additionally, since the time that the 22 m APZ was determined, a review of the vegetation structure within Lot 803 (in accordance with a revision to AS3959) has identified a reduced vegetation classification which (if supported by relevant review agencies) will result in a reduction to the extent of the APZ (and associated extent of clearing) required. As such, all references to partial clearing associated with the APZ is anticipated to be the maximum foreseeable extent of that clearing. The nominated extent of 22 m has been proposed due to uncertainties with potential amendments required to the concept plan and bushfire vegetation classifications throughout the environmental and planning approvals process.

Table ES.1 and Table ES.2 provide a summary of the proposal and the extent of its physical and operational elements.

Table ES.3 provides a summary of potential impacts, proposed mitigation and outcomes for the proposal. The key environmental factors relevant to this proposal are considered to be:

- Flora and vegetation
- Terrestrial fauna.

Table ES.1: Proposal summary table

Subject	Detail
Proposal title	179 (Lot 802) Erindale Road, Hamersley
Proponent name	Digital 4 Pty Ltd
Short description	The proposal is to clear native vegetation to enable Urban development within Lot 802
	Erindale Road, 11 km north-west of the Perth CBD, WA.
	The proposal will include the following land uses:
	urban development
	asset protection zone
	internal public road network
	public open space (POS)



Table ES.2: Physical and operational elements

Element	Location	Proposed extent
Physical elements		
 Urban development, including: residential development; internal public road network public open space (POS) drainage swales / basins sewer easement. 	Refer to Figure 1.2	No more than 11.584 ha, within a development envelope of 13.55 ha
Conservation Public Open Space	Refer to Figure 1.2	No more than 1.052 ha, within a development envelope of 13.55 ha
APZ	Refer to Figure 1.2	No more than 0.914 ha, within a development envelope of 13.55 ha

Table ES.3: Summary of potential impacts, proposed mitigation and outcomes

Element	Description	
Flora and vegetation		
EPA objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained	
Policy and guidance	Flora and vegetation surveys to inform planning for the proposal have been conducted in accordance with the <i>Technical Guidance – Flora and Vegetation Surveys for</i> <i>Environmental Impact Assessment</i> (EPA 2016a) and the <i>Environmental Factor Guideline:</i> <i>Flora and Vegetation</i> (EPA 2016b).	



Element	Description
Potential impacts	Direct impacts associated with complete clearing of a no more than 10.597 ha of native vegetation, and the partial clearing of no more than 0.844 ha of native vegetation (for an asset protection zone) of Banksia/ Jarrah native vegetation (FCT 28) which is a sub-community of the state listed Banksia Dominated Woodlands of the Swan Coastal Plain Priority 3 ecological community (PEC).
	FCT 28 is not listed separately by the State as a Threatened or Priority ecological community in its own right and is known from 80 point locations over a range of about 150 km from Red Gully to Leda (Gibson <i>et al.</i> 1994). Gibson <i>et al.</i> (1994) identified this FCT as having a mediumhigh species richness of 56 species per 100 m ² , however it is noted that average species richness recorded at the site was recorded to be 24.5 species per 100 m ² (based on data collected from nine 10 x 10 m quadrats). Given the species richness recorded, vegetation within the site is not considered a high diversity example of this FCT.
	Vegetation within the site is listed as a Threatened Ecological Community (TEC) under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act); being "Banksia Woodlands of the Swan Coastal Plain".
	The clearing will also impact one Priority 2 (maximum of 10 individuals) and one Priority 4 species (maximum of 64 individuals). The clearing of this flora is not considered to be significant impact.
	Potential indirect impacts may be associated with uncontrolled access, dust deposition, and through the spread of weeds and dieback.
	It is noted that the proposal does not involve:
	 impacts to any listed Threatened flora under the EPBC Act or Biodiversity Conservation Act 2016 (BC Act)
	 impacts to any vegetation that has 10% or less of its pre-European extent remaining (noting the site is in a constrained area)
	• reducing a vegetation complex/ association to 10% or less of its pre-European extent
	impacts to any riparian vegetation
	 impact to any areas reserved under statue or managed for the purpose of conservation
	• impacts to any of the 15 national biodiversity hotspots identified by the Threatened Species Scientific Committee.
Mitigation	Avoid:
	 Approximately 1.70 ha (12.55%) of the development envelope is proposed to be set aside as useable Public Open Space (POS) and drainage, within which patches of native vegetation, inclusive of Priority flora will be retained where possible. In the current Concept Plan, POS has been strategically located in areas of better- quality vegetation. Additionally, approximately 1.052 ha (7.7% of the development envelope) is proposed to be set aside as conservation, within which approximately 0.854 ha of native vegetation will be retained. Of the vegetation to be retained within the conservation area 76% (0.651 ha) is in Very Good condition and the remainder (0.203 ha) is in a Good to Degraded Condition.



Element	Description		
	 Development of a Construction Environmental Management Plan (CEMP), including: measures to avoid and mitigate impacts to native vegetation and Priority flora following commencement of the action (during construction), including: 		
	Rehabilitate:		
	While formal rehabilitation is not proposed within the site, landscaping will utilise native species that occur within the Banksia Woodlands TEC where possible.		
Outcomes	Significant residual impact:		
	Model, an offset will likely be required for significant residual impact significance Commonwealth EPBC Act listed Banksia Woodlands of the Swan Coastal Plain TEC. It is however noted, that at a State level, this is a Priority 3 Ecological Community, which are not afforded formal statutory protection. The clearing of Banksia Woodlands of the Swan Coastal Plain TEC has been referred to the Department of Agriculture, Water and the Environment (DAWE), and has been determined a controlled action. As such, impacts to this TEC will be assessed under the EPBC Act.		
	Offset:		
	 An offset will be required for significant residual impacts to the Commonwealth EPBC Act listed Banksia Woodlands of the Swan Coastal Plain TEC. This offset will be determined in consultation with the Department of Agriculture, Water and the Environment (DAWE) through the EPBC Act process. It is noted that the project has been determined a controlled action by the DAWE to be assessed on Preliminary Documentation. The offset strategy is detailed in Section 6 and Appendix G, and includes provision of approximately 2.312 ha of land within lot 803 as an environmental offset, which will (in combination with Conservation POS), function as a contiguous conservation area across approximately 3.364 ha. Comparatively, the total contiguous conservation area within Lot 802 and 803 (3.364 ha) represents over 28% of the maximum area to be cleared (11.441 ha). The vegetation contained within the total conservation areas covers approximately 2.346 ha, which represents over 20% of the maximum area to be cleared. acquiring Banksia woodland vegetation on the Swan Coastal Plain, within the distribution range of CBC to add to the State's conservation estate a contribution of funding towards the rehabilitation of conservation/ bushland areas within the CoS LGA, which contain Banksia Woodlands of the Swan Coastal Plain TEC. 		
Terrestrial fauna			
EPA objective	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained		
Policy and guidance	Terrestrial fauna surveys that have informed planning for the proposal have been conducted in accordance with the <i>Technical Guidance – Terrestrial Fauna Surveys for Environmental Impact Assessment</i> (EPA 2016c) and the <i>Environmental Factor Guideline: Terrestrial Fauna</i> (EPA 2016d).		



Element	Description
Potential impacts	 Direct impacts will be confined to the development envelope (Figure 1.1) and will involve complete and partial clearing (for an asset protection zone) of habitat for conservation significant species including: 0.632 ha of Good quality, 7.537 ha of Moderate-Good quality, and 3.272 ha of Very Poor quality foraging habitat for CBC
	 10.809 ha of Very Poor quality foraging habitat for FRTBC a maximum of 32 potential breeding (DBH ≥500 mm) trees for Black Cockatoos, none of which contain hollows suitable for breeding by Black Cockatoos.
	 11.441 ha of native vegetation providing potential habitat for Priority species Quenda, Graceful Sun moth, and Black-striped snake (Appendix C; Cardno 2010). Given the broad range of these species and their status as Priority 3 and Priority 4 fauna, (DBCA n.d.), this impact is not considered to be significant. Construction activities have potential to impact indirectly on adjacent fauna habitat through uncontrolled access, dust deposition, and through the spread of weeds and dieback
Mitigation	Avoid:
Witigation	 Approximately 1.70 ha is proposed to be set aside as useable POS, within which native vegetation (and by extension terrestrial fauna habitat) will be retained, where possible; Retention of 22 significant trees within road reserves and POS, where possible, including the only tree containing a hollow suitable for breeding by Black Cockatoos (based on the current Concept Plan). These trees will also provide foraging habitat for Black Cockatoos; Approximately 1.052 ha is proposed to be set aside as one consolidated Conservation POS, within which approximately 0.854 ha of fauna habitat will be retained.
	Minimise:
	 Consideration of installation of artificial black cockatoo hollows in retained mature trees Pre-clearing hollow inspections during breeding season or avoidance of clearing within breeding season Development of a Construction Environmental Management Plan (CEMP) including: measures to avoid and mitirate impacts to CBC and ERTEC and their babitat (during
	 Incustrics to avoid and intrigute impacts to eac and intribe and their nubital (during construction). performance indicators that measure the effectiveness of avoidance and mitigation measures monitoring, reporting and contingency measures that will be undertaken if performance targets are not met timeframes for the implementation of avoidance and mitigation measures roles and responsibilities of personnel associated with implementing avoidance and
	mitigation measures.
	 Rehabilitate: While formal rehabilitation is not proposed within the site, landscaping will utilise native vegetation where possible. Consideration of the provision of artificial hollow installation in retained mature
	trees.
Outcomes	trees. Significant residual impact:
	 In consideration of the WA Environmental Offset Guidelines Residual Impact Significance Model, an offset will likely be required for significant residual impacts to: 0.632 ha of Good quality, 7.537 ha of Moderate-Good quality, and 3.272 ha of Very Poor quality foraging habitat for CBC 10.809 ha of Very Poor quality foraging habitat for FRTBC a maximum of 32 potential breeding (DBH ≥500 mm) trees for Black Cockatoos, none of which contain hollows suitable for breeding by Black Cockatoos.
	Offset
	 Acquisition of land containing habitat for CBC/ FRTBC (refer Appendix G) Where required, consideration of contribution towards rehabilitation projects within local conservation areas Provision of approximately 2.312 ha of land within lot 803 as an environmental offset.
	which will (in combination with Conservation POS), function as a contiguous conservation area across approximately 3.364 ha.



1. Introduction

1.1 Purpose and scope

Digital 4 Pty Ltd (Digital 4; the Proponent) is proposing to rezone 179 (Lot 802) Erindale Road, Hamersley (the site) under the City of Stirling (CoS) Local Planning Scheme No. 3 (LPS No.3) from 'Local Reserve: Public Use Reserve (Commonwealth)' to 'Development Zone', enabling Urban development.

To facilitate Urban development, clearing of vegetation will be required within Lot 802 and a portion of the western edge of Lot 803. While future development will be contained within Lot 802, the proposed clearing footprint extends beyond Lot 802 into the adjacent lot (Lot 803) (owned by BAI Communications) to include clearing for bushfire management (asset protection zone [APZ]).

While this referral has allowed for a 22 m APZ along the entire eastern boundary of Lot 802, the location of the conservation area and public open space along the eastern boundary of Lot 802, has resulted in a reduction to the actual extent of clearing required for an APZ at these interfaces.

Additionally, since the time that the 22 m APZ was determined, a review of the vegetation structure within Lot 803 (in accordance with a revision to AS3959) has identified a reduced vegetation classification which (if supported by relevant review agencies) will result in a reduction to the extent of the APZ (and associated extent of clearing) required. As such, all references to partial clearing associated with the APZ is anticipated to be the maximum foreseeable extent of that clearing. The nominated extent of 22 m has been proposed due to uncertainties with potential amendments required to the concept plan and bushfire vegetation classifications throughout the environmental and planning approvals process.

The 'development envelope' for the purpose of this referral includes Lot 802, and part of Lot 803 required to encompass the development footprint, the APZ, and the proposed conservation area (Figure 1.2).

The development envelope is located approximately 11 km north-west of Perth Central Business District (CBD).

This supporting document has been prepared in accordance with Environmental Protection Authority (EPA) *Instructions on how to prepare an Environmental Review Document* (EPA 2018) to support referral of the Proposal under section 38 of the *Environmental Protection Act 1986* (EP Act).

1.2 Proponent

Table 1.1 below provides the details of the Proponent.

Subject	Details		
Proponent name	Digital 4 Pty Ltd		
ABN	79129827363 – Digital 4 Pty Ltd		
Postal address	Level 10, Tower A		
	799 Pacific Highway		
	Chatswood NSW 2067		
	Australia		
Proponent contact	Peter Lambourne (CEO)		

Table 1.1: Proponent and key contact details

1.3 Environmental impact assessment process

This supporting document aims to provide information for the EPA to determine the level of assessment of the proposal. This includes information and level of detail on:

• The proposal.



- Potential impacts.
- Mitigation measures.
- Environmental outcomes.
- Stakeholder consultation.

The Proponent has consulted with government agencies and key stakeholders to obtain feedback in relation to the proposal, to inform the EPA assessment of the proposal. A summary of stakeholder consultation undertaken thus far, is provided in Section 3.

The Proponent has also consulted with the Australian Government Department of Agriculture, Water and the Environment (DAWE) in relation to potential impacts to Matters of National Environmental Significance. These include:

- Carnaby's Black Cockatoo (Calyptorhynchus latirostris)
- Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso)
- Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community.

The proposal has been formally referred to the DAWE under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; see section 1.4).

1.4 Other approvals and regulation

The development envelope is currently zoned 'Urban' under the Metropolitan Region Scheme (MRS) and as Local Reserve: Public Use Reserve (Commonwealth) under the CoS Local Planning Scheme No. 3 (LPS No.3) (Figure 1.3). It is proposed to rezone the site to 'Development Zone' under the LPS No. 3. The site was previously owned by the Commonwealth of Australia; however, the land is now privately owned.

Table 1.2 provides a summary of the key environmental approval and regulations relevant to the proposal. Decision-making authorities (DMA's) relevant to the proposal include the DAWE and Minister for Planning.

Proposal activities	Land tenure/access	Type of approval	Legislation regulating the activity
Clearing of native vegetation	Freehold	Assessment of impacts on Matters of National Environmental Significance	EPBC Act
Land use and development planning	Freehold	Rezoning approval by the WAPC/ CoS	Planning and Development Act 2005
	Freehold	Structure Plan approval by the WAPC/ CoS	Planning and Development Act 2005
Subdivision (development including clearing of native vegetation)	Freehold	Subdivision approval by the WAPC/ CoS	Planning and Development Act 2005

Table 1.2: Other approvals

1.4.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Department of Agriculture, Water and the Environment (DAWE). The EPBC Act aims to protect and manage Matters of National Environmental Significance (MNES) throughout Australia including:

- World Heritage Properties.
- National Heritage Places.
- Wetlands of international importance (listed under the Ramsar Convention).



- Listed threatened species and ecological communities.
- Migratory species protected under international agreements.
- Commonwealth Marine Areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mines).

The proposal was referred to the DAWE on 18 February 2019 for assessment under EPBC Act (EPBC 2018/8324). On 3 June 2019, the delegate for the Minister for the Environment determined that the proposal was a controlled action requiring assessment through preliminary documentation with listed threatened species and communities (sections 18 and 18A of the EPBC Act) as the controlling provision.

A bilateral assessment from the Environmental Protection Authority (EPA) and DAWE on the environmental aspects of the Proposal was not considered by the Proponent at the time of referral under the EPBC Act. This is due to the development originally anticipated to be assessed under section 48 of the EP Act, which is not an accredited process. Given that a decision on assessment approach has been made by DAWE, a bilateral assessment is not an available option.

Strategen-JBS&G, on behalf of the Proponent, will endeavour to coordinate the State and Commonwealth assessment and approvals processes, should the project be formally assessed by the EPA.



Reference: www.nearmap.com@ - Imagery Date: 26 October 2019.



Reference: www.nearmap.com© - Imagery Date: 26 October 2019.





2. The proposal

2.1 Background and justification

An area of 12.4 ha fronting Erindale Road was identified as surplus to operational requirements by the Proponent and subdivided from the adjacent transmission site. The subdivision created two Lots; Lot 802 (179 Erindale Road) and Lot 803 (601 Wanneroo Road).

Lot 802 is currently zoned 'Urban' under the Metropolitan Region Scheme, and is designated 'Public Use: Commonwealth' under the City of Stirling LPS3.

As Lot 802 is no longer required for broadcasting activities, the designation 'Public Use: Commonwealth' is no longer appropriate and the Proponent is proposing to rezone the site to 'Development Zone' under the City's LPS3.

The rezoning of Lot 802 to Development Zone enables the land to be sold by the Proponent, to a suitable land developer, and developed for urban purposes, providing access and usability of the currently fenced landholding to the public/ future occupants.

The development envelope has not been identified for conservation protection under statute, and has not been identified as part of a green network within the Perth and Peel sub-regional frameworks.

The sub-regional frameworks do identify ecological corridors within Lot 802 and Lot 803. This is discussed further in Section 4.2.3.3.

2.2 Proposal description

2.2.1 Key proposal characteristics

Key proposal characteristics and elements are presented below in Table 2.1 and Table 2.2.

Subject	Detail
Proposal title	179 (Lot 802) Erindale Road, Hamersley
Proponent name	Digital 4 Pty Ltd
Short description	 The proposal is to clear native vegetation to enable Urban/ Residential development within Lot 802 Erindale Road, 11 km north-west of the Perth CBD, WA. Clearing of native vegetation will also occur within the western portion of Lot 803 to establish an Asset Protection Zone (APZ) to meet requirements for bushfire management. The proposal includes the following land uses: urban development asset protection zone internal public road network public open space (POS)

Table 2.1: Summary of the proposal

Table 2.2: Location and proposed extent of physical and operational elements

Element	Location	Proposed extent		
Physical elements				
 Urban development, including: residential development; internal public road network public open space (POS) drainage swales / basins sewer easement. 	Refer to Figure 1.2	No more than 11.584 ha, within a development envelope of 13.55 ha		
Conservation Public Open Space	Refer to Figure 1.2	No more than 1.052 ha, within a development envelope of 13.55 ha		



APZ (maximum)	Refer to Figure 1.2	No more than 0.914 ha, within a
		development envelope of
		13.55 ha

2.3 Local and regional context

The development envelope is located in Hamersley within the City of Stirling. Figure 1.1 represents the local context of the proposal.

Topography on the development envelope ranges from 38 m Australian Height Datum (AHD) in the north east to 18 m AHD in the south east. While a slight ridge in the centre of the development envelope divides it into two distinct hydrological catchments. Generally, there is a slope in topography across the development envelope in a south-west direction, with a low-point in the south-western corner of Lot 802 (Figure 2.1).

The proposal is located in the Swan Coastal Plain region, on the Spearwood Dunes land system, which consists of sand dunes and plains including yellow deep sands, pale deep sands and yellow/brown shallow sands (DPIRD 2018).

Regional environmental geology mapping (Gozzard 1983) indicates that the development envelope consists of Sand (S7) which is characterised by pale and olive yellow, medium to coarse grained, subangular to sub-rounded quartz, traces of feldspar moderately sorted of residual origin. These sands are typically derived from Tamala Limestone.

Groundwater is estimated to be encountered approximately 5 to 25m below ground level [bgl] based on review of the Department of Water and Environmental Regulation (DWER) *Perth Groundwater Atlas* (DWER 2019). Regional groundwater contours indicate that groundwater flow in westerly direction towards Big Carine Swamp, before discharging to the Indian Ocean (Figure 2.2).

The site is located within the Gwelup aquifer subarea which includes the confined Leederville and Yarragadee North aquifers. DWER reports that groundwater salinity levels in the vicinity are less than 250 mg/L (DWER 2019).

Information sourced from DWER (2017) identifies four aquifers of significance underlying the site; each assigned the name of the major geological unit in which the aquifer occurs. In descending order of depth from natural surface they are:

- Superficial Aquifer (Superficial Swan-Gwelup) (unconfined)- fully allocated
- Mirrabooka Aquifer (confined)-allocation available
- Leederville Aquifer (confined)-allocation available
- Yarragadee North (confined)- allocation available

Groundwater abstraction may be required for irrigation of POS. There are currently no groundwater licences issued for Lot 802. However, DWER (2017) indicates that groundwater allocation is available for the confined aquifers in the vicinity of the site.

The site is within the P3 Public Drinking Water Source Area (PDWSA) in the Perth Coastal Gwelup Underground Water Pollution Control Area (Figure 2.2).

The nearest Conservation Category Wetland (CCW) is Little Carine Swamp (UFI: 8189) located approximately 2.3 km northwest of the development envelope (Figure 2.2). There are no declared Ramsar wetlands present within the development envelope or within 3 km of the development envelope (WALGA 2019).



There are no surface water bodies or watercourses located within the development envelope or within 1 km of the development envelope. The closest mapped surface water body is Careniup Swamp, which is located 1.9 km south west of the development envelope.

At a local level, surrounding land uses include:

- North: immediately north Lennox Place and Blissett Way, with residential development further north.
- East: The remainder of Lot 803 (broadcasting operations) and Wanneroo Road. Residential development is located east of Wanneroo Road.
- South: Reid Highway and associated road reserve, as well as residential development. Industrial land uses beyond Reid highway.
- West: Erindale Road and residential development.

Significant remnant vegetation is also present within the local area, including:

- Road reserves associated with the Reid Hwy Mitchel Fwy interchange;
- Road reserves on the north and south sides of Roe Highway;
- Rannoch Reserve;
- Richard Guelfi Reserve; and
- Princess Wallington Reserve.

At a regional level, numerous conservation reserves of significant value exist within 12 km of the development envelope. These include:

- Whiteman Park;
- Kings Park;
- Bold Park;
- Star Swamp; and
- Gwelup Lake.







3. Stakeholder engagement

3.1 Key stakeholders

The following key stakeholders have been identified in relation to the proposal:

- Department of Agriculture, Water and the Environment (DAWE)
- Department of Water and Environmental Regulation (DWER)
- Department of Biodiversity, Conservation and Attractions (DBCA)
- City of Stirling
- DPLH/ WAPC
- Local residents.

3.2 Stakeholder engagement process

3.2.1 Community consultation

Community consultation undertaken so far has been in relation to:

- The advertising period associated with the proposal's referral under the EPBC Act;
- Voluntary engagement sessions with local residents in the City of Stirling (Hamersley), regarding the proposal, environmental approval processes and future State planning approval processes.

Moving forward, there will be formal advertising periods throughout the State planning process (i.e. rezoning and structure plan) which will provide an opportunity for the community to submit further feedback on the proposal, including land use and development design.

3.2.2 Regulatory consultation

Engagement with regulators (the details of which is provided in Table 3.1) has included the following:

- Meetings with the EPA (Anthony Sutton, Tom Hatton, Liesl Rohl).
- Engagement with the City of Stirling, including:
 - Proponent project team/ Officer level meetings
 - site walkover with City of Stirling Officers and Proponent project team
- Regular contact with the DAWE during the EPBC referral and assessment process, including:
 - one meeting in Canberra
 - teleconference and telephone discussions
 - email communication
- Department of Planning, Lands and Heritage/ WAPC, including:
 - Meeting with Proponent and David Caddy (WAPC Chairman).

3.3 Stakeholder consultation

3.3.1 Community consultation

A number of methods have been used to communicate with the community including:

• Development of a website (http://www.hamersleyproject.com.au/)



- Resident letter drop
- Online community survey
- Two voluntary community drop-in sessions (with the second session providing feedback from the first session)
- Development of Frequently Asked Questions (FAQ's), which are now available on the Hamersley project website at http://www.hamersleyproject.com.au/
- Advertisement for community drop-in sessions within the local newspaper, *The Stirling Times*.

Appendix B presents the proposal's Community Consultation Report, which was prepared following voluntary community engagement sessions.



3.3.2 Agency consultation

A summary of agency consultation undertaken by the project team to date, is provided in Table 3.1.

Table 3.1: Summary of agency consultation

Agency	Method of consultation	Date	Feedback/ outcomes
City of Stirling: City Staff	Meeting at City	20 th September 2018	Preliminary meeting regarding proposed rezoning
DPLH	Meeting at DPLH	23 rd August 2018	Preliminary discussion regarding proposed rezoning, discussion of application of subdivision to create site
<u>City of Stirling:</u> City Staff	Meeting at City	26 th October 2018	Second meeting with City staff, with landowner in attendance. Discussion of broad constraints, environmental work undertaken, the site's potential role in providing housing, potential early engagement, future program.
<u>City of Stirling:</u> City Staff	Meeting at City	15 th November 2018	Third meeting with expanded City staff. Discussion provided a landowner update, overview of environmental assessment completed, overview of traffic assessment, recap on opportunities & constraints. Meeting was updated on separate engagement with City Mayor & Councillors
WAPC, DPLH: Chairman (WAPC) Deputy Director General (DPLH)	Meeting at DPLH	12 th March 2019	Preliminary meeting to provide an overview of the project, the proposed consultation process and timing for rezoning submission.
<u>City of Stirling:</u> Fraser Henderson- Manager City Planning (Tentative) Ian Hunter- Manager Parks and Sustainability Paul Giamov- Manager Engineering Design Neil Maull- Coordinator City Planning Kym Burgess- A/Coordinator Project Management Landscape Architecture, Parks and Sustainability Daniel Rajah- Senior Environmental/ Conservation Officer	Site walkover and meeting	13 th March 2019	 This site walkover and meeting provided pre-lodgement (LPS rezoning) consultation with City of Stirling. Key matters discussed included: Environmental attributes of the site State (EP Act) and Commonwealth (EPBC Act) environmental approvals processes City of Stirling raised the potential to zone an area of conservation within the site During this meeting the Proponent outlined the potential for inclusion of Scheme provisions to address environmental/ conservation objectives.
<u>EPA</u> : Tom Hatton (EPA Chairman) Liesl Rohl (Manager EIA Environmental Planning Branch, EPA Services)	Meeting	17 May 2019	 Digital 4/ Strategen-JBS&G briefed EPA on the site history, investigations to date and key environmental characteristics of the site. EPA noted that attributes they would be focussed on, include: Good/ Very Good condition vegetation Significant Black Cockatoo habitat trees Black Cockatoo foraging habitat Ecological linkages



			Priority 2 species Acacia benthamii.	
City of Stirling:	Meeting at City	30 th July 2019	Fifth meeting to discuss environmental considerations and landowner's engagement with	
			the EPA, pre-lodgement community engagement (first drop-in session) outcomes, traffic	
			matters. Outline of next steps prior to rezoning lodgement.	
City of Stirling:	Meeting	23 rd August 2019	Meeting was held to discuss comments from Council meeting, on the proposal. Matters	
Gareth Glanville			discussed included:	
Ross Povey			• outcomes of community consultation (key themes being traffic, environment, building	
lan Hunter			heights and dwelling types)	
Rainer Walker			roundabout/ site access	
Paul Giamov			• Council's key environmental objectives for future applications (ecological linkages, Local Natural Area)	
			• EPBC process/ status for the Federally Listed species;	
			EPA will likely assess the proposal and environmental significance	
			Council acknowledged process by the state via the EPA (Section 48)	
			CoS acknowledge that as a responsible planning authority they need to consider a	
			rezoning for a site where the owner advises the zoning no longer relevant.	
EPA:	Meeting	25 th October 2019	Meeting was to discuss the opportunity for use of Section 38 of EP Act to assess the	
Anthony Sutton (Executive Director –			environmental impacts of the proposal, as opposed to Section 48, which is typically used	
			EPA were generally supportive of pursuing Section 38 process.	
City of Stirling:	Meeting at City	4 th November 2019	Meeting with City Councillors and staff. Landowner update provided on progress to date	
City Councillors			including partnering with Cedar Woods, progression of environmental report updates.	
City staff				
EPA:	Meeting	6 th November 2019	Meeting was to confirm the use of Section 38 of EP Act to assess the environmental	
Anthony Sutton			impacts of the proposal.	
Tom Hatton			Key discussion points included:	
Liesl Rohl			The importance of Stakeholder consultation	
			Assessment and approvals process	
			Potential offsets.	



4. Environmental principles and factors

4.1 Principles

The EP Act identifies a series of principles for environmental management. The environmental principles are the highest-level goals that a proposal must meet in order to be found environmentally acceptable by the EPA. The Proponent has considered these principles in relation to the development and implementation of the proposal. Table 4.1 outlines how the principles relate to the proposal.

Table 4.1: EP Act principles

Principle	Consideration
The precautionary principle	The proposal has been designed so that the precautionary principle is not
Where there are threats of serious	triggered and infringed.
irreversible damage, lack of full scientific	
certainty should not be used as a reason	The Proponent has used existing environmental data for the Swan Coastal
for postponing measures to prevent	Plain and has supplemented it with additional site specific studies - flora,
environmental degradation.	vegetation surveys and fauna habitat assessments.
In the application of the precautionary	
 principle, decisions should be guided by: a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and 	Consultation has been undertaken with key stakeholders to identify potential environmental impacts and appropriate management for the proposal.
 b) an assessment of the risk-weighted consequences of various options. 	As such, it is considered that the precautionary principal will be met, on the grounds that there is full scientific certainty on the environmental values present within the site, and the extent of environmental impact from the proposal.
	The proposal involves the direct (complete and partial) clearing of up to 11.441 ha of native vegetation, which contains no threatened flora, but which comprises the EPBC Act listed Banksia Woodlands of the Swan Coastal Plain TEC. A maximum of 10 individuals of <i>Acacia benthamii</i> , a Priority 2 flora species, and a maximum of 64 individuals of <i>Jacksonia sericea</i> , a Priority 4 flora species will be impacted. The TEC and Priority flora species are regionally distributed. Impacted vegetation is classified as Floristic Community Type 28 but comprises relatively lower species richness.
	Additionally, the impacted vegetation provides foraging habitat for CBC, of which 0.632 ha is of Good quality, 7.537 ha is of Moderate – Good quality, and 3.272 ha is of Very Poor quality. The impacted vegetation provides 10.809 ha of Very Poor quality foraging habitat for FRTBC, and 32 potential breeding (DBH ≥500 mm) trees for Black Cockatoos, none of which contain hollows suitable for breeding by Black Cockatoos. The impacted vegetation provides potential habitat for the Priority fauna - Quenda, Graceful Sun Moth, and Black-striped snake.
	Approximately 1.70 ha of the development envelope is proposed to be set aside as useable POS and drainage, within which patches of native vegetation will be retained where possible. Approximately 1.052 ha (7.76%) of the development envelope be set aside as conservation, within which approximately 0.854 ha of native vegetation will be retained.
	Significant residual environmental impacts will be offset locally through the preservation and protection of 1.492 ha of similar vegetation within Lot 803, which will be protected under a conservation covenant. A contribution of funding towards the rehabilitation of Local Natural Areas (containing black cockatoo habitat) within the City of Stirling will also be made. Additionally, direct acquisition offset will be made, which will be preserved under conservation covenant or State Government conservation reserve within the wider Swan Coastal Plain region.



The principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future	The proposal will not itself or cumulatively generate a risk of serious or irreversible damage to conservation significant environmental features. Consequently, the precautionary principle will not be engaged by the proposal. The proposal has been designed to address and comply with the principle of intergenerational equity. As stated above regarding the precautionary principle, the proposal will not generate a risk of serious or irreversible damage, and residual
generations.	environmentally significant impacts will be entirely offset. Environmental offsets are available for the proposed action to address environmentally significant impacts. Offsets will comprise a combination of publicly held land for conservation purposes and private land secured through conservation mechanisms / instruments. Additionally, through the use of the EPBC Act offsets calculator, offsets have been factored for vegetation quality, timing and other risk uncertainties to ensure complete offsets are provided.
	All impacts to the health, diversity and productivity of the environment are expected to be appropriately avoided, minimised, or offset, ensuring that in no intergenerational inequity is caused by the proposal.
	Accordingly, no decline in intergenerational equity is expected from the proposal into the future.
	Additionally, the proposal will facilitate the release of residential land and public open space that will be available for use by future generations and is located in an environmentally constrained areas to assist in reducing development pressures on the urban fringe and potentially more significant and wider environmental impacts.
Principles related to improved valuation,	Environmental constraint avoidance and management costs have been
Principles related to improved valuation, pricing and incentive mechanisms	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal.
Principles related to improved valuation, pricing and incentive mechanisms 1. Environmental factors should be included in the valuation of assets and	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal.
 Principles related to improved valuation, pricing and incentive mechanisms Environmental factors should be included in the valuation of assets and services. 	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal. The Proponent will be responsible for funding the cost of environmental avoidance and management measures.
 Principles related to improved valuation, pricing and incentive mechanisms Environmental factors should be included in the valuation of assets and services. The polluter pays principle – those 	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal. The Proponent will be responsible for funding the cost of environmental avoidance and management measures.
 Principles related to improved valuation, pricing and incentive mechanisms 1. Environmental factors should be included in the valuation of assets and services. 2. The polluter pays principle – those who generate pollution and waste 	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal. The Proponent will be responsible for funding the cost of environmental avoidance and management measures.
 Principles related to improved valuation, pricing and incentive mechanisms Environmental factors should be included in the valuation of assets and services. The polluter pays principle – those who generate pollution and waste should bear the cost of containment, 	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal. The Proponent will be responsible for funding the cost of environmental avoidance and management measures.
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 <u>Principles related to improved valuation,</u> <u>pricing and incentive mechanisms</u> Environmental factors should be included in the valuation of assets and services. The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. The users of goods and services should pay prices based on the full life cycle 	Environmental constraint avoidance and management costs have been considered in the planning and design of the proposal. The Proponent will be responsible for funding the cost of environmental avoidance and management measures.
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	Within the environs of the proposal, and indeed immediately adjacent to the
	within the environs of the proposal, and indeed initiately adjacent to the
	development envelope, similar native vegetation exists within the Reid
	Highway nature reserve strip (to the south of the development envelope and
	within Lot 803 (to the east of the development envelope).
	The proposal has been designed to include a 1.052 ha conservation area, within which approximately 0.854 ha of native vegetation will be retained. Of this vegetation, 76% (0.651 ha) is in Very Good condition and the remainder (0.203 ha) is in Good to Degraded condition. This area will be conserved under a legally binding conservation mechanism together with
	1.492 ha of contiguous vegetation within Lot 803.
	Furthermore, the translocation of Priority species (where appropriate) will
	be considered on advice from the DBCA.
	Clearing within the development envelope will be managed to allow the
	relocation of fauna into adjoining vegetation areas, and no conservation
	significant fauna species impacted by the proposal is a short range endemic.
	The final and indicate the to the componentiate destine construction
	I ne findings indicate that with appropriate design, construction
	management and offset acquisition, all impacts to biodiversity or ecology at
	a local and regional scale will effectively mitigated and managed.
	As such, it is considered that the proposal will satisfy this environmental
	principal and there will be no net reduction in diversity or ecological
	integrity.
Waste minimisation	Waste will be minimised by adopting the hierarchy of waste controls: avoid.
All reasonable and practicable measures	minimise, reuse, recycle and safe disposal.
should be taken to minimise the	During the construction phase, waste management will be a consideration of
generation of waste and its discharge into	the CEMP.
the environment.	

4.2 Key Environmental Factor 1 – Flora and Vegetation

4.2.1 EPA objectives

The EPA's Statement of Environmental Principles, Factors and Objectives (EPA 2018b) identifies the following objective for flora and vegetation:

 to protect flora and vegetation so that biological diversity and ecological integrity are maintained.

4.2.2 EPA policy and guidelines

Flora and vegetation surveys that have informed planning for the proposal have been conducted in accordance with the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) and the *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b).

4.2.3 Receiving environment

4.2.3.1 Overview

Vegetation occurring within the region was initially mapped at a broad scale (1:1 000 000) by Beard during the 1970s. This dataset has formed the basis of several regional mapping systems, including physiographic regions defined by Beard (1981) which led to the delineation of botanical districts as described in Beard (1990); the biogeographical region dataset (Interim Biogeographic Regionalisation for Australia, IBRA) for Western Australia (DotEE 2017a) and System 6 Vegetation Complex mapping undertaken by Heddle et al. (1980).

The development envelope occurs within the Drummond Botanical Subdistrict which is typically characterised by low *Banksia* woodlands on leached sands; *Melaleuca* swamps on poorly-drained



depressions; and *Eucalyptus gomphocephala* (Tuart), *Eucalyptus marginata* (Jarrah) and *Corymbia calophylla* (Marri) woodlands on less leached soils (Beard 1990).

The development envelope occurs within the Swan Coastal Plain 2 IBRA subregion which is dominated by *Banksia* or Tuart on sandy soils, *Casuarina obesa* on outwash plains and paperbark (*Melaleuca*) in swampy areas (Mitchell *et al.* 2002).

It is noted that in consideration of the above Botanical Subdistrict and IBRA subregion, the site is dominated by Banksia woodland vegetation on well-drained soils, and there is no presence of surface water, wetlands/ swamps or marsh areas.

At a finer scale, the site falls within the Spearwood_6 vegetation system association (i.e. Medium woodland; tuart & jarrah) as defined by Beard (1990).

System 6 mapping refers to vegetation mapping undertaken at a Vegetation Complex scale by Heddle *et al.* (1980). The development envelope occurs within the Karrakatta complex – central and south which is described as:

• Predominantly open forest of *E. gomphocephala - E. marginata - E. calophylla* and woodland of *E. marginata - Banksia* spp.

Table 4.2 presents DBCA (2018) Southwest Vegetation Complex Statistics Report for the Karrakatta complex – central and south. In terms of biodiversity conservation targets, the National Objectives and Targets for Biodiversity Conservation 2001 – 2005 aims to (Environment Australia 2001):

- Prevent clearing of ecological communities with less than 30% of the original extent remaining
- Recover ecological communities with less than 10% of the original extent remaining.

These national targets are reflected in state government policy for Western Australia and generally, are used to guide planning and decision-making (WAPC 2010). However, in relation to bushland conservation within the Perth Metropolitan Region portion of the Swan Coastal Plain, which is recognised as a constrained area, State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region and Bush Forever seeks to protect a target of at least 10% of the original extent of each vegetation complex (WAPC 2010).

	Swan Coastal Plain				
Vegetation Complex / association	Pre-European Extent (ha) Current extent (ha) % remaining % remaining with State conservation estate				
Karrakatta complex – central and south	53,081	12,467.20	23.5%	8%	
Spearwood_6 vegetation system association	54,427	13287.64	24.41%	3.42%	

Table 4.2: Southwest Vegetation Complex Statistics Report (2018)

There is currently 23.5% of the pre-European extent of the Karrakatta vegetation complex – central and south within the Swan Coastal Plain, which is above the 10% retention objective for constrained areas. Concerning vegetation associations, there is 24.41% of the Spearwood_6 system association remaining within the Swan Coastal Plain, which is also above the 10% retention objective for constrained areas.

Based on historical aerial photography (Landgate 2017) the site was extensively cleared in early 1965, with significant disturbance in the mid-1970s. Since the 1980s, there has been natural regeneration of vegetation on site.



4.2.3.2 Field survey

An assessment of flora and vegetation within the development envelope was completed by two senior ecologists from Strategen (now Strategen-JBS&G) on 21 November 2017. An additional follow-up targeted flora survey was undertaken on 4 September 2018. A summary of these surveys is provided in the following sections.

The field survey was conducted according to standards set out in the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) to identify the vegetation and flora values on site and to confirm the presence of priority threatened and priority flora species.

Refer to Appendix C for a full report which combines these two surveys.

Native flora

A total of 72 native vascular plant taxa from 25 plant families were recorded from 8 vegetation quadrats and one releve within the development envelope. The majority of taxa were recorded within the Fabaceae and Cyperaceae families (refer to Appendix C).

An average species richness of 24.5 species per 100 m^2 was recorded within the development envelope (based on data collected from nine $10 \times 10 \text{ m}$ quadrats).

Average species richness for the equivalent Floristic Community Type (FCT 28) was recorded by Gibson *et al.* (1994) as being 55.2 species per 10 x 10 m plot. This is almost twice the number of species recorded within the development envelope.

Threatened and Priority flora

No Threatened flora species as listed under the EPBC Act or *Biodiversity Conservation Act 2016* (BC Act) were recorded within the development envelope. However, two Priority flora species, *Acacia benthamii* (P2 – 10 individuals) and *Jacksonia sericea* (P4 – 64 individuals), as listed by Western Australian Herbarium (1998-) were recorded within the development envelope (Figure 4.1).

Priority 2 species are species that are known from one or a few locations (generally five or less). Species may be listed as Priority 2 if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

DBCA's *NatureMap* database identifies 43 records of *Acacia benthamii*, ranging in distribution from north of Lancelin, south to (just north of) Busselton, with many of these records on the Swan Coastal Plain in the Perth and Peel regions (refer to Plate 1). It is acknowledged that the *NatureMap* database results may include historic records of individuals which are no longer present as a result of clearing/ habitat destruction, however spatial mapping of the *NatureMap* occurrences suggests that many of these records are within conservation areas. As such, it is likely that a considerable portion of these records relate to protected occurrences which are currently existing.

NatureMap suggests that two of the recorded occurrences of this species are located within 6 km of the site, within bushland in the Padbury/ Craigie locality, and the Marangaroo/ Kingsway locality.





Plate 1: Locations of NatureMap recorded occurrences of Acacia benthamii

Priority 4 species can be any one of the following:

- Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
- Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
- Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy

DBCA's *NatureMap* database identifies 88 records of *Jacksonia sericea* ranging in distribution from Carabooda, south to (just east of) Mandurah, with all of these records on the Swan Coastal Plain in the Perth and Peel regions (refer to Plate 2). *NatureMap* suggests a number of the recorded occurrences of this species are located within 2km of the site, within bushland in the Warwick and Balga localities.





Plate 2: Locations of NatureMap recorded occurrences of Jacksonia sericea

Vegetation types

Vegetation within the development envelope can be broadly described as a woodland of *Banksia attenuata and Banksia menziesii* with emergent *Eucalyptus marginata*. Three vegetation types (VTs) were defined and mapped within the development envelope (Figure 4.1), which are summarised in Table 4.3. Areas containing vegetation in a highly degraded state have not been counted as unique VT's but have been included within Table 4.3 for area calculation purposes. The total area mapped within the development envelope was 13.55 ha which includes completely cleared areas (Table 4.3).

Vegetation Type	Description	Area (ha)	Percentage (%) of Site
BaDdSc	Banksia attenuata and B. menziesii isolated low to mid woodland over Xanthorrhoea preissii, Hakea prostrata, Hibbertia hypericoides, Daviesia divaricata subsp. divaricata and Grevillea vestita subsp. vestita open mid heathland over Thysanotus dichotomus, Scaevola canescens, and Ptilotus polystachyus herbland.	5.318	39%
BaXpHh	Banksia attenuata and B. menziesii low woodland with some areas of Eucalyptus marginata mid open woodland over Xanthorrhoea preissii, with scattered Macrozamia riedlei, Hakea prostrata and Jacksonia furcellata tall sparse to open shrubland over Hibbertia hypericoides, Petrophile macrostachya, Daviesia nudiflora var. nudiflora heathland.	6.345	47%
BpTrJs	Banksia prionotes low woodland over Templetonia retusa sparse mid shrubland over Jacksonia sericea, Daviesia nudiflora subsp.	0.632	5%

Table 4.3: Vegetation types



Vegetation Type	Description	Area (ha)	Percentage (%) of Site
	nudiflora and *Avena barbata mixed open heathland/ tussock grassland		
С	Cleared areas (including tracks).	1.255	9%
Total		13.55 ha	100

Statistical analysis of the species composition of VTs within the project area showed strong linkage to Floristic Community Type (FCT) 28, which is described as Spearwood *Banksia attenuata* or *Banksia attenuata* - Eucalyptus woodlands (Strategen 2018). While FCT 28 is not listed as a Threatened or Priority ecological community in its own right, this FCT is a sub-community of the state listed Banksia Dominated Woodlands of the Swan Coastal Plain, which is listed as a Priority Three ecological community by the DBCA (2019). FCT 28 is well represented with a range of approximately 105 km (linear distance); the community has been recorded from Thompsons Lake north to Seabird (Gibson *et al.* 1994).

Gibson *et al.* (1994) identified this FCT as having a medium-high species richness of 56 species per 100 m², however it is noted that average species richness recorded at the site (Strategen-JBS&G 2019) was 24.5 species per 100 m² (based on data collected from nine 10 x 10 m quadrats). Given the species richness recorded within the site, vegetation is not considered a high diversity example of this FCT.

Vegetation condition

The development envelope comprises both disturbed and undisturbed vegetation. Weed invasion is the principle disturbance with heavier infestations present at the development envelope boundaries. Potential causes of degradation to the development envelope include the effects from introduced species and edge effects of urbanisation. Based on the Keighery (1994) scale (Table 4.4)., vegetation condition within the development envelope ranged from very good to completely degraded (Table 4.5; Figure 4.2).

Condition rating	Description
Pristine (1)	Pristine or nearly so, no obvious sign of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-
	aggressive species.
Very Good (3)	Vegetation structure altered obvious signs of disturbance.
	For example, disturbance to vegetation structure caused by repeated fires, the presence of
	some more aggressive weeds, dieback, logging and grazing.
Good (4)	Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains
	basic vegetation structure or ability to regenerate it.
	For example, disturbance to vegetation structure caused by very frequent fires, the presence
	of some very aggressive weeds at high density, partial clearing, dieback, grazing.
Degraded (5)	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not
	to a state approaching good condition without intensive management.
	For example, disturbance to vegetation structure caused by very frequent fires, the presence
	of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded (6)	The structure of the vegetation is no longer intact, and the area is completely or almost
	completely without native species. These areas are often described as 'parkland cleared' with
	the flora comprising weed or crop species with isolated native trees or shrubs.

Table 4.4: Vegetation co	ondition scale	(Keighery 1994)
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Table 4.5: Area (ha) covered by each vegetation condition category within the development envelope

Vegetation Condition	Area (ha)	Percentage of the development envelope (%)
Very Good	5.335	39 %
Good	4.654	35 %
Degraded	2.306	17 %
Completely Degraded	1.255	9 %
Grand Total	13.55	100 %

Introduced (exotic) taxa

A total of nine introduced (exotic) taxa were recorded within the development envelope:

- Aira caryophyllea (Silvery Hairgrass)
- Avena barbata (Bearded Oat)
- Briza maxima (Blowfly Grass)
- Ehrharta calycina (Perennial Veldt Grass)
- Euphorbia terracina (Geraldton Carnation Weed)
- Gazania linearis (Gazania)
- Gladiolus caryophyllaceus (Wild Gladiolus)
- Pelargonium capitatum (Rose Pelargonium)
- Ursinia anthemoides.

None of these species are Declared Plant species in Western Australia pursuant to section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act), according to the Western Australian Department of Agriculture and Food (DPIRD 2017).

4.2.3.3 Conservation areas and ecological linkages

There are no Bush forever Sites within or adjacent to the development envelope (Figure 4.3). The closest Bush Forever sites are:

- Bush forever site 202- Warwick Open Space Conservation Area- 1km north
- Bush forever site 203- Carine Swamp 2.1km west.

According to Del Marco *et al.* (2004) the importance of ecological linkage is to connect natural areas, preferably with continuous corridors of native vegetation, which assists in fauna movement between the areas to access resources and habitats. The protection, management and buffering of existing natural areas within an ecological linkage is a higher priority than revegetation of cleared portions of the link. The development envelope lies at the junction of two mapped (WALGA 2004) regional ecological linkages, specifically Link ID: 6 and Link ID: 22 (Figure 4.3).

Bush forever sites 202 and 203 are both separated from the development envelope by urban development and significant road infrastructure. This has implications for the ecological linkages which run through the site, in that the linkages are utilised by avifauna only and are of little ecological value otherwise to additional flora and fauna.

It is noted however, the development envelope was not identified as "Regionally Significant Linkage of Bushland/ Wetland Areas" within Bush Forever Volume 2 (GoWA 2000). It is noted that Reid Highway (located south of the site) was identified within Bush Forever Volume 2 as a "Potential Regionally Significant Bushland/ Wetland Linkage".



It is noted that the development envelope is currently fenced for the purpose of safety and security associated with the broadcasting infrastructure within Lot 803, thus provides limited function as an ecological linkage for ground-dwelling fauna.









4.2.4 Potential impacts

4.2.4.1 Direct impacts

The proposal will result in the complete clearing of a maximum of 10.597 ha, and the partial clearing of a maximum of 0.844 ha of native vegetation. In this case, partial clearing refers to that clearing required for maintenance of an APZ as per Schedule 1 of the *Guidelines for Planning in Bushfire Prone Areas* (the Guidelines; WAPC 2017). Clearing for these purposes allows for the retention of 15% canopy cover, as well as managed understorey vegetation. The APZ will be located within (Lot 803) and will be managed to the standard prescribed in Schedule 1 of the Guidelines (refer to Appendix D).

While this referral has allowed for a 22 m APZ along the entire eastern boundary of Lot 802, the location of the conservation area and public open space along the eastern boundary of Lot 802, has resulted in a reduction to the actual extent of clearing required for an APZ at these interfaces.

Additionally, since the time that the 22 m APZ was determined, a review of the vegetation structure within Lot 803 (in accordance with a revision to AS3959) has identified a reduced vegetation classification which (if supported by relevant review agencies) will result in a reduction to the extent of the APZ (and associated extent of clearing) required.

As such, all references to partial clearing associated with the APZ is anticipated to be the maximum foreseeable extent of that clearing. The nominated extent of 22 m has been proposed due to uncertainties with potential amendments required to the concept plan and bushfire vegetation classifications throughout the environmental and planning approvals process.

A breakdown of the areas to be cleared by vegetation type and vegetation condition is provided in Table 4.6 and Table 4.7.

Vegetation Type	Completely cleared (ha)	Partially cleared for APZ (ha) (maximum extent)	Total (ha)
BaDdSc	4.657	0.661	5.318
BaXpHh	5.309	0.182	5.491
BpTrJs	0.632	0	0.632
Total area	10.597	0.843	11.441

Table 4.6: Proposed areas to be cleared and partially cleared, by vegetation type

Table 4.7: Proposed area	s to be cleared and par	rtially cleared by v	egetation condition

Vegetation Condition	Completely cleared (ha)	Partially cleared for APZ (ha)	Total (ha)
Very Good	4.685	0	4.685
Good	4.227	0.326	4.553
Degraded	1.686	0.517	2.203
Total area	10.597	0.844	11.441

The proposed maximum clearing of 11.441 ha of native vegetation represents 0.08 % of the remaining extent of the Spearwood_6 system association, and 0.09% of the Karrakatta vegetation complex – central and south. The proposed clearing will not reduce the pre-European extent of either the Karrakatta vegetation complex – central and south or the Spearwood_6 system association, to 10% or less remaining.

The vegetation to be cleared comprises "Banksia dominated woodlands of the Swan Coastal Plain IBRA region" (specifically FCT 28) which is a sub-community of the DBCA listed Banksia Dominated Woodlands of the Swan Coastal Plain Priority 3 ecological community (PEC).

FCT 28 is not listed separately by the State as a Threatened or Priority ecological community in its own right and is known from 80 point locations over a range of about 150 km from Red Gully to Leda (Gibson *et al.* 1994). As outlined in Section 4.2.3.2, Gibson *et al.* (1994) identified this FCT as having a



medium-high species richness of 56 species per 100 m^2 , however it is noted that average species richness recorded at the site (Strategen-JBS&G 2019) was 24.5 species per 100 m^2 (based on data collected from nine $10 \times 10 \text{ m}$ quadrats). Given the species richness recorded at the site, the vegetation is not considered a high diversity example of this FCT.

Vegetation within the site is Commonwealth EPBC Act listed "Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community" (TEC), and is currently being assessed by DAWE under the EPBC Act.

Included in the above clearing area is the removal (and possible translocation pending DBCA consultation) of a maximum of 10 individuals of *Acacia benthamii* (Priority 2) and 64 individuals of *Jacksonia sericea* (Priority 4).

While the proposal will result in the clearing of a portion of mapped regional ecological linkages, it is noted that the development envelope was not identified as "Regionally Significant Linkage of Bushland/ Wetland Areas" within Bush Forever Volume 2 (GoWA 2000). It is noted that Reid Highway (located south of the site) was identified within Bush Forever Volume 2 as a "Potential Regionally Significant Bushland/ Wetland Linkage".

It is noted that the development envelope is currently fenced for the purpose of safety and security associated with the broadcasting infrastructure within Lot 803. This, as well as the surrounding road infrastructure and urban development means that the site provides limited function as an ecological linkage for ground-dwelling fauna.

4.2.4.2 Indirect impacts

Construction activities have the potential to impact on adjacent native vegetation through accidental clearing of vegetation outside of the development envelope, erosion, uncontrolled access, dust deposition, and through the spread of weeds and dieback.

Alteration of hydrological regimes as a result of development of the site has the potential to impact adjacent vegetation, however this is not anticipated to be significant.

4.2.4.3 Cumulative impacts

A broad analysis of the potential cumulative impacts to flora and vegetation has identified that the proposed clearing of 11.441 ha within the Karrakatta complex – central and south represents only 0.10% of its current extent on the Swan Coastal Plain (GoWA 2019a). Similarly, clearing of 11.441 ha of the Spearwood 6 vegetation association represents only 0.09% of the current extent (GoWA 2019b) of this association in the Swan Coastal Plain IBRA region. The proposed clearing will not reduce the extent remaining of the above pre-European vegetation complex/ association, to 10% or less.

Given the above, it is considered that the proposed clearing of Karrakatta Complex – central and south will not significantly increase the cumulative loss of this vegetation complex at a regional (Swan Coastal Plain) scale.

4.2.5 Assessment of impacts

The proposal is not expected to cause significant impacts to flora and vegetation, based on the following:

- No proposed impact to any listed Threatened flora under the EPBC Act or BC Act.
- No proposed impact to any vegetation that has 10% or less of its pre-European extent remaining (noting the site is in a constrained area).
- Clearing associated with this proposal will not reduce any vegetation complex/ association to 10% or less of its pre-European extent.



- No proposed impact to any riparian vegetation.
- No proposed impact to any areas reserved under statue or managed for the purpose of conservation.
- No proposed impact to any of the 15 national biodiversity hotspots identified by the Threatened Species Scientific Committee.
- No clearing of State listed TEC's, or Priority 1 and 2 ecological communities- noting that Priority 3 category of vegetation within the site does not indicate that the community is poorly represented, and suggests that the community may be well known from several localities but may not meet adequacy of survey requirements and/or are not well defined.
- FCT 28 has a broad distribution having been recorded from 80 point locations from Red Gully to Leda (Gibson *et al.* 1994), approximately 105 km (linear distance), and species richness recorded within the site was comparatively low when compared to quality representations of this FCT.
- No dewatering is anticipated at any stage of the proposed development.
- Application of mitigation measures to minimise direct and indirect impacts (see Section 4.2.6).

4.2.6 Mitigation

The environmental objective for flora and vegetation is to protect flora and vegetation so that biological diversity and ecological integrity are maintained. This objective will be attained through the implementation of the impact mitigation hierarchy (avoid, minimise, rehabilitate). These mitigation measures are discussed below.

4.2.6.1 Avoid

Approximately 1.052 ha is proposed to be set aside as Conservation Public Open Space (POS) (Appendix A), with the purpose of retaining and conserving native vegetation and fauna habitat therein. This Conservation POS has been strategically located in areas of better quality vegetation, for example 76% (0.651 ha) of the Conservation POS contains vegetation in Very Good condition and the remainder (0.203 ha) is in a Good to Degraded Condition.

Additionally, approximately 1.70 ha (12.5%) of the development envelope is also proposed to be set aside as useable POS and drainage (Appendix A). The Concept Plan has been designed with consideration of the sites constraints (topography, drainage, access requirements and presence of sewer easement), and has endeavoured to locate POS in areas of better quality vegetation. Some patches of native vegetation may be retained within useable POS where bushfire requirements and other development constraints allow. Vegetation retained within useable POS will consist of species associated with the Banksia Woodland TEC, and will provide habitat to conservation significant fauna.

Potential vegetation exclusions (as per AS3959) that may be utilised to allow for retention of vegetation within POS, without introducing a bushfire risk, include:

- Single areas of vegetation less than 1 ha in area and not within 100 m of other areas being classified
- Multiple areas of vegetation less than 0.25 ha and not within 20 m of habitable buildings, or each other, or other areas of vegetation being classified
- Strips of vegetation less than 20 m in width, not within 20 m of habitable buildings, or each other, or other areas of vegetation being classified.



It is anticipated that the proposed northern POS (POS 1 [2066 m²] and POS 2 [5518 m²]) could accommodate an area of vegetation retention, on the premise that the retention of vegetation does not render the POS "restricted". Through detailed development design, the Proponent will consider additional opportunities to retain pockets of native vegetation within POS.

In addition to the retention of native vegetation in POS, mature native trees will be retained within POS and road reserves where possible. This includes significant black cockatoo habitat trees, as discussed in Section 4.3.6.

Additionally, POS areas including drainage swales/ basins will be landscaped utilising native species of local provenance, in order to provide habitat to conservation significant fauna.

Where vegetation is retained within useable POS, it will be located in areas of best quality, and where possible may incorporate a portion of retained Priority 2 and 4 flora species.

It is noted that the standard requirement for provision of POS in a development, is 10% as per Development Control Policy 2.3 (WAPC 2002), which is being adequately met by the proposed concept plan.

The Concept Plan has attempted to maintain green linkages through the strategic placement of POS, as well as the retention of conservation areas both within Lot 802, and also within Lot 803 (which is discussed further in Section 6). POS may incorporate retention of patches of native vegetation and mature trees, where development constraints permit, and will include landscaping with native species. East-west linkages are maintained through the three proposed northern POS areas, which connect to vegetation within Lot 803, as well as existing POS north-east of Lennox Place.

Canopy cover will be retained within the APZ (15% cover), and understorey vegetation managed, thus providing a north-south linkage which connects to proposed POS 1, landscaping within the sewer easement and the proposed conservation areas in the southern portion of Lot 802 and 803.

It is noted that in the existing state, the development envelope is fenced and relatively isolated from other areas of vegetation, including conservation areas, thus does not provide significant value as a linkage (specifically for ground dwelling fauna). Given the isolated nature of the development envelope, the Proponent has maximised connectivity with Reid Highway and Lot 803 vegetation as much as possible, through placement of conservation areas in the southern portion of the site.

4.2.6.2 Minimise

Prior to ground disturbing works commencing within the development envelope, a CEMP will be developed and will be implemented during the clearing and construction process. The CEMP will include the following:

- measures to avoid and mitigate impacts to native vegetation and Priority flora following commencement of the action (during construction), including:
 - hygiene requirements to prevent the spread of weeds and *Phytophthora* dieback
 - clearing and access control measures (such as demarcation of clearing boundaries)
 - erosion and sediment control
 - topsoil management
 - dust control
 - waste and fire management
- performance indicators that measure the effectiveness of avoidance and mitigation measures
- contingency measures that will be undertaken if performance targets are not met



 roles and responsibilities of personnel associated with implementing avoidance and mitigation measures.

Additionally, consideration will be given to of translocation of Priority species on advice from the Department of Biodiversity, Conservation and Attractions.

4.2.6.3 Rehabilitate

While no formal rehabilitation is proposed, streetscaping associated with road reserves and POS throughout the development will utilise native species where possible (Appendix A).

A contribution toward local rehabilitation projects will be considered as part of the nominated offset strategy, as discussed in Section 6.

4.2.7 Predicted outcome

The proposal will result in the complete clearing of a maximum of 10.597 ha, and the partial clearing of a maximum of 0.844 ha (APZ) of native vegetation.

The proposed clearing will not reduce the pre-European extent of either the Karrakatta vegetation complex – central and south or the Spearwood_6 system association, to 10% or less remaining.

No state-listed TEC's, riparian vegetation or Threatened flora species are expected to be impacted by the proposal. Additionally, the proposal will not impact upon any conservation areas which are protected under statute.

The proposal will result in the clearing of a maximum of 11.441 ha of State-listed PEC in Degraded to Very Good condition. Impacts to this PEC will be effectively mitigated and regulated through the EPBC referral and approval process, noting that Banksia woodlands of the Swan Coastal Plain (SCP) (Commonwealth) TEC has been listed as a controlling provision on the DEE's referral decision. As such, the Proponent will be required to demonstrate that impacts to vegetation across the site are appropriately mitigated and/ or offset. It is noted that given the geographic range of this TEC, an offset will likely be required within the SCP IBRA region comprising similar vegetation to that within the development envelope.

Where Priority flora is proposed to be cleared, the Proponent will consider options to translocate these individuals to conservation areas, on advice of the EPA and DBCA.

Conservation POS covering 1.052 ha, and which includes 0.651 ha of Very Good quality vegetation will be set aside for the purpose of retaining and conserving native vegetation. The Proponent will also retain native vegetation and mature trees within unrestricted POS and road reserves, where development constraints permit. Landscaping will be undertaken with native species of local provenance.

Through retention of vegetation within the proposed conservation areas within Lot 802, as well as retention of vegetation and landscaping with native species within POS, green linkages will be maintained within the development envelope which connect to vegetation within Lot 803 and the Reid Highway road reserve. As outlined in Section 6, a conservation area is proposed to be protected within Lot 803, which will be contiguous with the proposed conservation area across both lots.

In the longer term, conservation POS within Lot 802 will be ceded to the City of Stirling, and the conservation area within Lot 803 will remain under the ownership of BAI Communications for the foreseeable future.

The Proponent will implement a CEMP to minimise direct and indirect impacts to flora and vegetation during the construction stage of development.

Based on the scale and nature of the impacts, the location away from sensitive environmental areas, the mitigation measures to be implemented, as well as the State planning process and EPBC approval process, the proposal is not expected to cause significant impacts to flora and vegetation.



Accordingly, it is expected that the EPA objective for flora and vegetation will be met.

4.3 Key Environmental Factor 2 – Terrestrial Fauna

4.3.1 EPA objectives

The EPA's Statement of Environmental Principles, Factors and Objectives (EPA 2018b) identifies the following objective for terrestrial fauna:

• To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

4.3.2 EPA policy and guidance

Terrestrial fauna surveys that have informed planning for the proposal have been conducted in accordance with the *Technical Guidance – Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA 2016c) and the *Environmental Factor Guideline: Terrestrial Fauna* (EPA 2016d).

4.3.3 Receiving environment

4.3.3.1 Overview

A desktop search of the DBCA *Naturemap* and EBPC Act *Protected Matters* databases identified a number of conservation significant fauna that have a potential to occur within the vicinity of the development envelope (Appendix E). Excluding migratory wetland bird species (on the basis that there are no geomorphic wetlands or open water bodies within the development envelope), the desktop fauna assessment identified seven conservation significant fauna that could potentially occur within the development envelope. Based on habitat requirements, five of these species were considered either possible or likely to utilise the development envelope. These species are listed below in Table 4.8 and include:

- Two threatened species.
- One Priority 3 species.
- Two Priority 4 species.

Priority 3 species are those which are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

Priority 4 species are those which are adequately known, are rare but not threatened, or meet criteria for near threatened. Alternatively, Priority 4 species may have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons.

Enocios	Conservation status		Ushitat	Likelihood of presence within
species	BC Act	EPBC	Habitat	the site
		Act		
Carnaby's Cockatoo	Т	E	Typically occurs in woodlands and scrubs of	Evidence of foraging by CBC was
(CBC)			semiarid interior of Western Australia, in non-	observed during the Strategen
(Calyptorhynchus			breeding season wandering in flocks to	2018 surveys.
latirostris)			coastal areas, especially pine plantations and	
			Banksia woodlands. Food includes the	No breeding evidence was
			flowers, nectar and seeds of Banksia,	recorded during the hollow
			Dryandra, Hakea, Eucalyptus, Corymbia,	assessment (Appendix F).
			Grevillea, also seeds of Pinus.	
Forest Red-tailed	Т	V	It inhabits the dense Eucalyptus marginata	The modelled distribution for
Black Cockatoo			(Jarrah), E. diversicolor (Karri) and Corymbia	FRBC as per DSEWPaC (2012)
(FRTBC)			calophylla (Marri) forests receiving more than	indicates that the species is
			600mm of annual average rainfall.	likely to occur within the vicinity

Table 4.8: Conservation significant fauna species likely to occur within the development envelope



(Calyptorhynchus banksii subsp. naso)				of the project area. However, The FRBC foraging quality recorded within the project area is Very Poor (Strategen, 2018), based on a low density of favourable foraging species for FRTBC. Therefore, the project area supporting FRBC foraging habitat is limited. No breeding evidence was recorded during the hollow assessment (Appendix F).
Quenda, southwestern brown bandicoot (<i>Isoodon</i> <i>fusciventer</i>)	Ρ4		Quenda have a patchy distribution through the Jarrah and Karri forest, the Swan Coastal Plain. Scrubby, often swampy, vegetation with dense cover up to 1 m high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover.	Likely. Strategen 2016 survey did not record any evidence of species occurring within the site, however this species has a broad range and suitable habitat is present on site. The species was also considered likely to be present during the Harewood (2008) survey.
Black-striped Snake, (Neelaps calonotos)	Р3		Banksia woodlands and sandy areas of the Perth region.	Possible- This species has a broad range and the site contains suitable habitat (i.e. Banksia Woodland).
Graceful Sunmoth (Synemon gratiosa)	Ρ4	-	Sun-moths are most common in sedgelands, heathlands, woodlands and sometimes in open parts of the forest where their 'foodplants' (various grasses, sedges and mat- rushes) are found. Most sun-moths only breed on one or two plant species - their caterpillars are adapted to feed only on these particular plants. The graceful sun-moth breeds on two species of Lomandra mat-rushes (<i>L. maritima</i> <i>and L. hermaphrodita</i>).	Possible- Lot supports Lomandra maritima and L. hermaphrodita which provides habitat for the Graceful Sun Moth. Graceful Sun Moth were observed within Lot 803 (Harewood 2009; Cardno 2010).

4.3.3.2 Black Cockatoos

The site is located within the breeding and non-breeding range of FRTBC and within the nonbreeding range of CBC (Environmental Resources Information Network (ERIN) 2016a; ERIN 2016b).

The site is not located within the range of Baudin's black cockatoo and therefore vegetation within the site does not provide habitat for this species, based on the current known distribution (ERIN 2016c).

Survey effort

In September 2009 a Carnaby's Black Cockatoo (CBC) habitat assessment was completed by Greg Harewood for the development envelope and remainder of Lot 803, with the objective of assessing CBC breeding, foraging and roosting habitat (Harewood 2009). An additional follow-up Black Cockatoo habitat assessment was completed by Strategen for the same area in November 2017 and September 2018 by two experienced consultants (Strategen 2018; Appendix A). Based on the results of this survey, a targeted Black Cockatoo nest hollow assessment was subsequently conducted by two experienced consultants on 22 October 2019 (Strategen-JBS&G 2019; Appendix F). Both the 2018 habitat assessment and 2019 nest hollow assessment were conducted according to standards set out in the *Technical Guidance: Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA 2016c) and the EPBC Act *Referral Guidelines for Three Threatened Species of Black Cockatoo* (DSEWPaC 2012). A summary of these surveys is provided in the following sections. Refer to Appendix A and Appendix F for full reports.



Foraging habitat

Within the development envelope, 12.294 ha is considered foraging habitat for CBC and FRTBC. Habitat within the site is considered to provide Very Poor to Good quality habitat for CBC, however provides only Very Poor quality habitat for FRTBC, due to a lack of suitable foraging species (Figure 4.4). It is noted that foraging evidence for CBC has been recorded within the site.

Foraging species within the development envelope consist of *Eucalyptus marginata* and *E. gomphocephala*, *Banksia attenuata*, *B. menziesii*, *B. prionotes*, *Mesomelaena pseudostygia*, and *Xanthorrhoea preissii*.

Habitat foraging quality of each vegetation type is shown in Table 4.10 and was determined using the scale described in Table 4.9. Areas of Black Cockatoo habitat by habitat quality is shown within Table 4.11.



Table 4.9: Definitions of Black Cockatoo foraging habitat quality

Foraging quality	Justification
Excellent	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) and presence of food sources at several strata (i.e. canopy, midstorey and understorey).
Good	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) but food sources only present at one or two strata (i.e. canopy and midstorey).
Moderate	Moderate foraging value density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 20-40%) and food sources only present at one or two strata (i.e. canopy and midstorey).
Poor	Low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 10-20%) and presence of food sources at only one stratum (i.e. canopy).
Very poor	Very low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species <10%) and presence of food sources at only one stratum (i.e. canopy).
Nil	Cleared areas - no suitable vegetation present.

Table 4.10: Vegetation types and Black Cockatoo foraging species within the development envelope

Vegetation type	Black cockatoo foraging species	Foraging quality
BaDdSc	CBC – Banksia attenuata, B. menziesii, B. prionotes, Mesomelaena	Moderate - Good (CBC)
	pseudostygia, Xanthorrhoea preissii	Very poor (FRTBC)
	FRTBC - Eucalyptus marginata	
	Foliage cover of black cockatoo foraging species: 20% - 60+%	
BaXpHh	CBC – Banksia attenuata, B. menziesii, Eucalyptus marginata,	Moderate - Good (CBC)
	Mesomelaena pseudostygia, Xanthorrhoea preissii	Very poor (FRTBC)
	FRTBC - Eucalyptus marginata	
	Foliage cover of black cockatoo foraging species: 30% - 60+%	
BpTrJs	<u>CBC</u> – Banksia prionotes, B. attenuata	Good (CBC)
		Nil (FRTBC)
С	Cleared	<u>CBC</u> – Nil
		FRTBC – Nil

Table 4.11: Black Cockatoo habitat

Black cockatoo habitat	Area (ha)
Good (CBC only)	0.632
Moderate – Good (CBC) / Very poor (FRTBC)	8.208
Very Poor (CBC and FRTBC)	3.454
TOTAL	12.294

Significant tree survey

Two species of eucalypts, *E. marginata* (jarrah) and *E. gomphocephala* (tuart) recorded in the development envelope, are considered Black Cockatoo potential breeding habitat when their diameter at breast height (DBH) is >500 mm. The development envelope contains 33 trees with a DBH of > 500 mm. Seventeen (17) of these trees contained hollows, including *Eucalyptus marginata* and *Eucalyptus gomphocephala*, and unidentifiable dead eucalypts. Observations indicated five (5) trees contained hollows of a size and orientation suitable for nesting by Black Cockatoo species. One tree contained a potential hollow on the upper side of a large limb; however, it was not possible to determine from the ground whether or not this constituted a suitable nesting hollow. All hollows were identified within *E. marginata* or dead eucalypts.

Hollow assessment

Of the five trees originally identified to contain hollows suitable for breeding by black cockatoos, only one hollow was confirmed to be suitable following the hollow assessment. This hollow was determined to be suitable based on the following:

• A hollow entry height of 7 m above ground level



- A hollow entry diameter of 15 cm
- Depth of the hollow being 50 cm
- Chew marks were observed on the periphery of the hollow entrance (Appendix F).

It is noted however that an adult Kookaburra (*Docelo novaeguineae*) was flushed from the hollow during the tap-and-flush phase of the assessment, and three eggs were observed at the base of the hollow, assumed to belong to this species (Appendix F).

Of the remaining 29 hollows included in the assessment, all were determined to be unsuitable based on the hollow entry diameter being under the required 10 cm, or hollow depth being less than the required 50 cm. It should also be noted that beehives were observed within five of the surveyed hollows, rendering them at least temporarily unsuitable for use by Black Cockatoos.

The locations of the potential breeding trees (significant trees) and hollows are displayed in Figure 4.4.

Local and regional context

The following provides a broad description of Black Cockatoo foraging habitat available within a 6 km to 12 km radius from the Development envelope, based on publicly available spatial information. These distances have been nominated due to the knowledge that whilst breeding, Black Cockatoos will generally forage within 6 to 12 km from their nesting site (DWSEPaC 2012). As a result of this mobility range, the potential for reduced flowering and seed set due to drought, as well as the irregular or infrequent flowering and fruit patterns of many of their food sources, large areas of foraging habitat are required to support black cockatoo populations (DSWEPaC 2012).

Figure 4.5 presents the broadly mapped potential feeding areas for Carnaby's Cockatoo within 6 km and 12 km of the development envelope. Spatial analysis has identified that within a 6 km radius of the development envelope there is approximately 904 ha of potential foraging habitat, of which approximately 645 ha is protected within conservation areas (legislated lands, Bush forever, Conservation/ Resource Enhancement Wetlands).

Extending further out and within a 12 km radius of the development envelope, there is approximately 4 458 ha of potential foraging habitat, of which approximately 3 322 ha is protected within conservation reserves (legislated lands, Bush forever, Conservation/ Resource Enhancement Wetlands). Large, intact areas of potential black cockatoo habitat are mapped within 12 km of the site, associated with Bush Forever Sites in Cullacabardee, Gnangara and Whiteman.

Black cockatoos will forage up to 12 km from breeding hollows during the breeding season and rely on this proximity of foraging resources to breeding hollows to successfully raise chicks (DotEE 2017b). Given the limited foraging habitat within 12 km (less than 10 % of the 12 km area) in comparison to other areas with ample foraging resource, such as State forest located further north and east of the site, the site is unlikely to be utilised for breeding.

A search of the Great Cocky Count data set prepared by Birdlife WA (2010 -) identified two known roosting sites within 1 km of the development envelope (site codes: STIHAMR001 and STIBALR001; Figure 4.5). The roosting site to the east of the development envelope (STIBALR001) recorded 10 FRTBC between 2014 and 2018 and no CBC. The roosting site to the west of the development envelope (STIHAMR001) recorded no FRTBC between 2014 and 2018 and 2010 and 2010 and 2010 and 2010 and 2010 and 2018.

While the site was not directly included in the Great Cocky Count, no roosting sites were identified within the development envelope.

As part of the preparation of this referral, DBCA were contacted to obtain information on nearest breeding records. DBCA advised that the nearest confirmed breeding record is located 20 km east of



the project area. The WA Museum also confirmed that they have no record of breeding activity at the project area.

There are also no permanent standing bodies of water within the development envelope that would provide drinking water to Black Cockatoos. The closest water source is Lake Gwelup, located approximately 3 km west of the site.

4.3.3.3 Ecological linkages

According to Del Marco *et al.* (2004) the importance of ecological linkage is to connect natural areas, preferably with continuous corridors of native vegetation, which assists in fauna movement between the areas to access resources and habitats. The protection, management and buffering of existing natural areas within an ecological linkage is a higher priority than revegetation of cleared portions of the link.

The development envelope lies at the junction of two regional ecological linkages, specifically Link ID: 6 and Link ID: 22 (Figure 4.3). it is noted that the development envelope was not identified as "Regionally Significant Linkage of Bushland/ Wetland Areas" within Bush Forever Volume 2 (GoWA 2000). It is noted that Reid Highway (located south of the site) was identified within Bush Forever Volume 2 as a "Potential Regionally Significant Bushland/ Wetland Linkage".

It is noted that the development envelope is currently fenced for the purpose of safety and security associated with the broadcasting infrastructure within Lot 803, thus provides no function as an ecological linkage for ground-dwelling fauna.







4.3.4 Potential impacts

4.3.4.1 Direct impacts

The proposal will result in the complete clearing of a maximum of 10.597 ha, and the partial clearing of a maximum of 0.844 ha of black cockatoo habitat. In this case, partial clearing refers to that clearing required for maintenance of an APZ as per Schedule 1 of the Guidelines (WAPC 2017). Clearing for these purposes allows for the retention of 15% canopy cover, as well as managed understorey vegetation. The APZ will be located within Lot 803 and will be managed to Schedule 1 of the Guidelines (refer to Appendix D).

While this referral has allowed for a 22 m APZ along the entire eastern boundary of Lot 802, the location of the conservation area and public open space along the eastern boundary of Lot 802, has resulted in a reduction to the actual extent of clearing required for an APZ at these interfaces.

Additionally, since the time that the 22 m APZ was determined, a review of the vegetation structure within Lot 803 (in accordance with a revision to AS3959) has identified a reduced vegetation classification which (if supported by relevant review agencies) will result in a reduction to the extent of the APZ (and associated extent of clearing) required.

As such, all references to partial clearing associated with the APZ is anticipated to be the maximum foreseeable extent of that clearing. The nominated extent of 22 m has been proposed due to uncertainties with potential amendments required to the concept plan and bushfire vegetation classifications throughout the environmental and planning approvals process.

A breakdown of the areas to be cleared by black cockatoo habitat quality is provided in Table 4.12.

Habitat quality	Completely cleared (ha)	Partially cleared for APZ (ha) (maximum extent)	Total (ha)
Good (CBC only)	0.632	0	0.632
Moderate – Good (CBC) / Very	7.278	0.259	7.537
poor (FRTBC)			
Very Poor (CBC and FRTBC)	2.688	0.584	3.272
Total area	10.597	0.843	11.441

Table 4.12: Proposed areas to be cleared and partially cleared, by black cockatoo habitat quality

Additionally, the proposal will result in the clearing of a maximum of 33 significant trees (DBH >500 mm) for black cockatoos, 17 of which were observed from ground level as containing potential suitable nesting hollows, during the black cockatoo habitat assessment (Appendix F). During the hollow assessment (Appendix F), only one tree was identified as containing a hollow currently suitable for breeding (based on hollow attributes). It is noted however that this hollow was occupied by a kookaburra (with three eggs).

The proposal will also result in the removal of a maximum of 11.441 ha of native vegetation, providing potential habitat for Quenda, Graceful Sunmoth, and Black-striped snake species. Each of these species are broad ranging, with the site only representing a fraction of the total known range.

4.3.4.2 Indirect impacts

Construction activities have the potential to impact on adjacent fauna habitat through erosion, uncontrolled access, dust deposition, and through the spread of weeds and dieback. Higher traffic volumes within the development envelope following completion of the development also has the potential to increase the risk of fauna strikes.

4.3.4.3 Cumulative impacts

The following provides a broad analysis of cumulative impacts to Black Cockatoo foraging habitat within a 6 to 12 km radius from the development envelope. This is based on the knowledge that breeding Black Cockatoos will generally forage within 6 to 12 km from their nesting site (DSEWPaC 2012). As a result of this mobility range, the potential for reduced flowering and fruit patterns of



many of their food sources, large areas of foraging habitat are required to support black cockatoo populations (DSWEPaC 2012).

In relation to the development envelope, the proposed clearing of 11.441 ha represents only 1.4% of potential foraging habitat within 6 km of the site and 0.3% within 12 km of the site. On this basis, the proposed clearing of up to 11.441 ha of Black Cockatoo foraging habitat within the development envelope and the wider Hamersley locality is considered unlikely to significantly increase the cumulative impact at a regional or local scale.

4.3.5 Assessment of impacts

The proposal will result in the complete clearing of a maximum of 10.597 ha, and the partial clearing of 0.844 ha of black cockatoo habitat, including:

- 0.632 ha of Good quality, 7.537 ha of Moderate-Good quality, and 3.272 ha of Very Poor quality foraging habitat for CBC.
- 10.809 ha of Very Poor quality foraging habitat for FRTBC.

The proposal will result in the clearing of a maximum of 33 significant trees (DBH >50 cm), only one of which contains a hollow suitable for Black Cockatoo nesting (currently utilised by a kookaburra for nesting). This tree is proposed to be retained within, along with a number of other potential breeding trees (as outlined in Section 4.3.6).

Additionally, there are a number of Bush Forever sites located within 6 km of the development envelope which are likely to provide forging habitat for Black Cockatoos (Figure 4.5). It is noted that vegetation will remain within Lot 803 and the Reid Highway road reserve for the foreseeable future, which comprises black cockatoo habitat.

While the proposal will result in the clearing of a portion of mapped regional ecological linkages, it is noted that the development envelope was not identified as "Regionally Significant Linkage of Bushland/ Wetland Areas" within Bush Forever Volume 2 (GoWA 2000). It is noted that Reid Highway (located south of the site) was identified within Bush Forever Volume 2 as a "Potential Regionally Significant Bushland/ Wetland Linkage".

It is noted that the development envelope is currently fenced for the purpose of safety and security associated with the broadcasting infrastructure within Lot 803, thus provides limited function as an ecological linkage for ground-dwelling fauna.

With the exception of the clearing of Black Cockatoo habitat, the proposal is not expected to cause significant impacts to terrestrial fauna, based on the following:

- Of the 11.441 ha proposed to be cleared, 0.843 ha will be only partially cleared for the purpose of an APZ, in accordance with the requirements of *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2017).
- Clearing of approximately 11.441 ha of potential habitat for Quenda, Graceful Sun Moth and Black-striped Snake, which are Priority species only. It is noted that ground-dwelling native fauna can be relocated into Lot 803 or otherwise, prior to clearing of fauna habitat, in accordance with an anticipated future subdivision condition to this effect.
- No clearing of "Regionally Significant Linkage of Bushland/ Wetland Areas" as mapped within Bush Forever Volume 2 (GoWA 2000).
- No clearing of wetland/ riparian habitat, or conservation areas protected under statute.
- Habitat within the project area is unlikely to provide favourable habitat for migratory species, due to lack of available surface water.



• Application of mitigation measures to minimise direct and indirect impacts (see Section 4.3.6).

4.3.6 Mitigation

The environmental objective for terrestrial fauna will be attained through the implementation of the impact mitigation hierarchy (avoid, minimise, rehabilitate). These mitigation measures are discussed below.

4.3.6.1 Avoid

Approximately 1.052 ha is proposed to be set aside as Conservation Public Open Space (POS) (Appendix A), with the purpose of retaining and conserving native vegetation and fauna habitat therein. This Conservation POS has been strategically located in areas of better quality vegetation, for example, 76 % (0.651 ha) of the Conservation POS contains vegetation in Very Good condition and the remainder (0.203 ha) is in a Good to Degraded Condition.

Additionally, approximately 1.70 ha (12.5%) of the development envelope is also proposed to be set aside as useable POS and drainage (Appendix A). The Concept Plan has been designed with consideration of the sites constraints (topography, drainage, access requirements and presence of sewer easement), and has endeavoured to locate POS in areas of better quality vegetation. Some patches of native vegetation may be retained within useable POS where bushfire requirements and other development constraints allow, thus providing opportunity for retention of isolated areas of habitat.

Potential vegetation exclusions (as per AS3959) that may be utilised to allow for retention of vegetation within POS, without introducing a bushfire risk, include:

- Single areas of vegetation less than 1 ha in area and not within 100 m of other areas being classified
- Multiple areas of vegetation less than 0.25 ha and not within 20 m of habitable buildings, or each other, or other areas of vegetation being classified
- Strips of vegetation less than 20 m in width, not within 20 m of habitable buildings, or each other, or other areas of vegetation being classified.

It is anticipated that the proposed northern POS (POS 1 [2066 m²] and POS 2 [5518 m²]) could accommodate an area of vegetation retention, on the premise that the retention of vegetation does not render the POS "restricted". Through detailed development design, the Proponent will consider additional opportunities to retain pockets of native vegetation within POS. Additionally, POS areas including drainage swales/ basins will be landscaped utilising native species of local provenance.

In addition to the retention of native vegetation in POS, mature native trees will be retained within POS and road reserves where possible. This includes significant black cockatoo habitat trees. The current Concept Plan proposes the retention of 22 significant trees within POS and road reserves (subject to detailed design). It is noted that the tree identified as containing a hollow suitable for breeding by Black Cockatoos is proposed to be retained within POS.

As outlined previously, the Proponent is adequately meeting the 10 % POS requirement, as per the concept plan (Appendix A).

The Concept Plan has attempted to maintain green linkages through the strategic placement of POS, as well as the retention of conservation areas both within Lot 802 and Lot 803 (which is discussed further in Section 6). Useable POS may incorporate retention of patches of native vegetation and mature trees, where development constraints permit, and will include landscaping with native species. East-west linkages are maintained through the three proposed northern POS areas, which connect to vegetation within Lot 803, as well as existing POS north-east of Lennox Place.



Canopy cover will be retained within the APZ (15% cover), and understorey vegetation managed, thus providing a north-south linkage which connects to proposed POS 1, landscaping within the sewer easement and the proposed conservation areas in the southern portion of Lot 802 and 803.

It is noted that in the existing state, the development envelope is fenced and relatively isolated from other areas of vegetation, including conservation areas, thus does not provide significant value as a linkage (particularly for ground dwelling fauna). Given the isolated nature of the development envelope, the Proponent has maximised connectivity with Reid Highway road reserve and Lot 803 vegetation as much as possible, through placement of conservation areas in the southern portion of the site.

4.3.6.2 Minimise

Prior to ground disturbing works commencing within the development envelope, a CEMP will be developed and will be implemented during the clearing and construction process. The CEMP will include the following measures to avoid and mitigate impacts to CBC, FRTBC and other relevant conservation significant fauna:

- Contractor fauna education inductions
- Procedures for injured fauna
- Avoid clearing within Black Cockatoo breeding season, where possible.
- Where clearing is proposed during Black Cockatoo breeding season potential breeding trees will be inspected by a suitably qualified ecologist prior to clearing
- Pre-clearing fauna relocation
- strict enforcement of speed limits within the development envelope and along local minor roads
- clearing being undertaken progressively towards the neighbouring bushland in Lot 803 (if safety fencing requirements to broadcasting towers permit)
- clearing and access control measures (such as demarcation of clearing boundaries)
- erosion and sediment control
- dust control
- waste and fire management.

4.3.6.3 Rehabilitate

While formal rehabilitation is not proposed, streetscaping associated with road reserves and POS throughout the development will utilise native species where possible, with a particular focus on known foraging species for CBC (DSEWPaC 2012). It is expected that this landscaping will reinstate some fauna habitat post-construction, including for Quenda and the black-striped snake, and will assist with maintaining ecological linkages for avian species.

The Proponent will consider the installation of artificial nest hollows within the site and/ or local area. The Proponent will also consider utilisation of any felled trees/ logs for fauna habitat creation in conservation areas and/ or POS.

4.3.7 Predicted outcome

The proposal will not result in the clearing of any potential breeding trees, that currently contain hollows with suitable dimensions for breeding. Based on the absence of evidence of breeding and the limited availability of foraging habitat in nearby conservation areas in comparison to larger



conservation areas located further north and east, the project area is unlikely to be favoured for breeding. As such, it is not anticipated that the proposal will result in the clearing of habitat currently used by black cockatoos for breeding purposes.

The proposal will result in the clearing of a maximum of 11.441 ha of foraging habitat for Black Cockatoos (of which up to 0.843 ha will be only partially cleared for the purpose of an APZ).

The Proponent will demonstrate mitigation through retention of habitat within Conservation and useable POS and road reserves, habitat creation through landscaping with native species, and through implementation of pre-clearing fauna inspections and relocation.

Additionally, impacts to fauna habitat are anticipated to be effectively managed and mitigated through the development and implementation of the CEMP and through the provisions of the future planning and development approvals process.

Despite the application of the mitigation hierarchy as detail above, the proposal may be considered to result in significant residual impacts to foraging habitat of CBC. Significant residual impacts to CBC will be addressed through provision of an offset strategy, as outlined in Section 6.



5. Other environmental factors or matters

No other environmental factors established by the EPA for the purposes of environmental impact assessment were considered significant for the proposal, as presented in Table 5.1.

Environmental factor	Significance of impact	
Benthic Communities and Habitat	The proposal is not located adjacent or nearby coastal areas.	
Coastal Processes	The proposal is not located adjacent or nearby coastal areas.	
Marine Environmental Quality	The proposal is not located adjacent or nearby marine areas.	
Marine Fauna	The proposal is not located adjacent or nearby marine areas.	
Landforms	The proposal will involve a small scale of earthworks and does lie within or	
	nearby a high value landscape.	
Subterranean Fauna	No dewatering is anticipated to be required as part of the proposed	
	development. As such, there will be no significant impacts to subterranean	
	fauna as a result of the proposed development.	
Terrestrial Environmental Quality	The proposal is not expected to cause significant impact to terrestrial	
	environmental quality. Erosion and sedimentation may occur during	
	construction, however these impacts are not expected to be significant and	
	can be effectively managed through a CEMP. Topography and soils are not a	
	constraint to the proposed development.	
	A search of the Swan Coastal Plain Acid Sulphate Soils risk map (DWER 2019b)	
	mulcales that there is no known risk of Acid Sunate Sons (ASS) occurring	
	moderate ASS disturbance rick within 3 m of the natural soils surface is	
	located approximately 1.8 km south of the site. ASS is not considered a	
	constraint to development	
Inland Water	Groundwater is estimated to be encountered approximately 5 to 25m below	
	ground level [bgl] (DWER 2019), thus appropriate separation from proposed	
	development (ground floor level) to groundwater is anticipated.	
	The site is within the P3 Public Drinking Water Source Area (PDWSA) in the	
	Perth Coastal Gwelup Underground Water Pollution Control Area. For urban	
	(residential) developments in P3 areas it is recommended that there is deep	
	sewerage connection and the implementation of urban water sensitive design	
	practices. The proposal will provide deep sewer connection and therefore is	
	considered compatible with the P3 PDWSA.	
	No natural surface water expressions or geomorphic wetlands are present on	
	site, or located adjacent to the site.	
	There are no declared Ramsar wetland (Wetlands of International	
	Importance) present within the site or within 3 km of the site (WALGA 2017)	
	Given the absence of surface water features, and the anticipated separation	
	to groundwater, the potential for impacts to inland waters in limited.	
	Additionally, dewatering is not anticipated as part of the proposed	
	development.	
	Potential temperaty impacts to water quality may be associated with	
	construction activities and include:	
	construction derivities, and module.	
	erosion and sedimentation during construction	
	accidental splits of fuels or chemicals during construction	
	 stormwater runoff from roads and nousing following completion of the development 	
	development.	
	in order to address the above potential impacts associated with construction,	
	standard construction management measures will be included in the CEMP,	
	spill response procedures	
	pa holow ground fuel or chamical storage	
	 clearing and access control measures (such as demarcation of clearing 	
	houndaries)	
	erosion and sediment control	
	waste and fire management.	

Table 5.1: Assessment of other environmental factors



	The hydrological regime and water quality of the development envelope will be maintained, and will be required to be demonstrated through the preparation of an LWMS and UWMP as part of the standard planning and development process. Additionally, the proposal may require abstraction of groundwater for irrigation of POS. The Proponent will limit the requirement for groundwater abstraction where possible through use of native species in landscaping. If groundwater abstraction is required, the Proponent will seed a groundwater abstraction licence. Groundwater licencing is regulated by DWER. Based on the anticipated absence of dewatering, the location of the site away from Conservation Category and Ramsar wetlands, as well as the adequate depth to groundwater, the proposal is not expected to cause significant impacts to the hydrological regime or quality of groundwater and surface water. Additionally, all anticipated impacts are anticipated to be effectively managed through the development and implementation of the CEMP and LWMS/ UWMP and through the groundwater licencing process.	
	Accordingly, it is expected that the EPA objective for inland waters will be	
Air Quality	The Proposal will result in minor air (dust) emissions during construction which will be managed through a CEMP, and will not result in long term increased vehicle emissions in the local area.	
Social surroundings	As presented in Figure 1.1, the development envelope is surrounded by predominately urban residential and commercial land uses. The urban residential areas surrounding the development envelope have aesthetic surroundings typical of residential areas within the Perth Metropolitan region, with a strong visual and acoustic influences associated with commuter activities along Reid Highway, Erindale Road and Wanneroo Road.	
	The proposal is expected to provide a compatible extension of the existing land use of the local area and improve economic and social values in the vicinity, by increasing the availability of affordable housing and Public Open Space.	
	A search of the Department of Planning Land and Heritage Aboriginal Her Inquiry System (DPLH 2019) (search conducted 06 November 2017) identi no Registered Sites within the development envelope or within 1 km of th site.	
	A search of the Heritage Council of Western Australia (HCWA) <i>inherit</i> website identified two European heritage places within Hamersley, however, no European State Registered Places are located within the development envelope. (HCWA & SHO 2019). The nearest European heritage listed place is 'Rectory' (Place Number: 11519) which is located approximately 720 m west of the development envelope.	
	Potential indirect impacts to social surrounds are expected to be temporary and associated with construction. These include:	
	dust emissions and deposition	
	noise and vibration from machinery	
	• construction waste such as litter and debris	
	 construction vehicle traffic including heavy vehicles supplying materials. 	
	The above potential impacts will be managed through the design and implementation of a CEMP, which will be prepared prior to ground disturbing works commencing within the development envelope.	
	The proposal may cause ongoing potential impacts on aesthetic and social values due to an increase in traffic volumes along local and minor roads. Traffic considerations are required to be addressed through the standard	



	planning and development process and it is anticipated that the development of the site may provide opportunities to improve traffic flow in the local area (based on traffic assessments to date and feedback from local residents).		
	The proposal is not expected to cause a significant impact to social surrounds due to the following:		
	 no Aboriginal or European heritage places have been identified within the development envelope 		
	 all anticipated impacts will be managed and mitigated through the design and implementation of the CEMP 		
	 in the longer term, anticipated impacts to the local area are expected to be positive, due to the increase in availability of Public Open Space and affordable housing. 		
	 landscaping and streetscaping will include native vegetation where possible to maintain and enhance the visual character of the area 		
	 shared use paths will be provided to maintain and enhance existing access networks 		
	 Approximately 1.5 ha of Public Open Space (including drainage areas) will be developed for the benefit of the wider community. 		
	Accordingly, it is expected that the EPA's objective for social surrounds will be met.		
Human Health	The Proposal will not result in significant impacts to human health.		
	Noise is not expected to be severe and consistent with EPA guidance (EPA		
	2016f) is addressed under Social Surroundings.		



6. Offsets

Based on the application of the mitigation hierarchy (illustrated in Plate 3: Mitigation hierarchy (Government of Western Australia (GoWA) 2014)) and the outcomes of this impact assessment, it is anticipated that significant residual impacts to CBC foraging habitat and Banksia Woodlands of the Swan Coastal Plain TEC will be required to be offset.



Plate 3: Mitigation hierarchy (Government of Western Australia (GoWA) 2014)

An offset strategy has been developed and implemented in accordance with the following key policies and guidelines:

- WA Environmental Offsets Policy (GoWA 2011)
- WA Environmental Offsets guidelines (GoWA 2014)

The offset strategy is provided at Appendix G.

It is noted that an offset strategy is currently being developed as part of the Preliminary documentation required under the EPBC Act assessment process. It is anticipated that the offset will be required for listed threatened species (CBC) and communities (Banksia woodland TEC). The offset strategy will be prepared in accordance with the *EPBC Act Environmental Offsets Policy* (DSEWPaC 2012b).

The intention is to align the offset requirements of the State and Commonwealth through provision of an offset package which demonstrates no significant residual impacts to:

- CBC foraging habitat (noting foraging habitat for FRTBC is 'Very Poor')
- Banksia woodlands of the Swan Coastal Plain (Commonwealth TEC, State PEC (P3)).

The Proponent is currently investigating offset opportunities, including:

- provision of approximately 2.312 ha of land within Lot 803 to be protected via conservation covenant, which is inclusive of 1.492 ha of native vegetation;
- acquiring Banksia woodland vegetation on the Swan Coastal Plain, within the distribution range of CBC to add to the State's conservation estate



- a contribution of funding towards the rehabilitation of conservation/ bushland areas within the CoS LGA which may contain CBC foraging habitat and Banksia Woodlands of the Swan Coastal Plain TEC, such as:
 - Lake Gwelup restoration
 - Jackadder Lake wetland margin restoration
 - Basalt Silver Topaz Bushland enhancement project
 - Star Swamp Reserve.

The opportunity to contribute to rehabilitation projects within the local area will be discussed with the CoS.

It is noted that Digital 4 proposes to enter into an agreement with the landowner of Lot 803, to ensure the preservation and protection of approximately 2.312 ha of land for conservation purposes within Lot 803 which contains approximately 1.492 ha of native vegetation. The proposed 2.312 ha offset area within Lot 803 will be contiguous with the 1.052 ha conservation POS area (comprising 0.854 ha of vegetation) within Lot 802 and 803, providing approximately 2.346 ha of vegetation protection across approximately 3.364 ha. Comparatively, the total conservation area within Lot 802 and 803 (3.364 ha) represents over 29% of the maximum area of native vegetation to be cleared (11.441 ha).

Vegetation condition mapping was undertaken in part of Lot 803 by Cardno in 2008. This mapping was then extrapolated to the remainder of Lot 803 to give an indication of the vegetation condition within the total proposed conservation area. Of the 2.346 ha of vegetation within the contiguous conservation area, approximately 1.979 ha (84%) is considered to be in Very Good condition, and 0.267 ha (11%) is considered to be in a Degraded condition. Comparatively, the total area of Very Good vegetation proposed for protection (1.979 ha) represents 17% of the maximum area of native vegetation proposed to be cleared (11.441 ha).

Another flora and vegetation survey is proposed to be undertaken of Lot 803 as part of the Section 38 referral process, both to update the Cardno (2008) survey and to provide confidence in the environmental values to be included in the proposed offset.

In terms of determining the size and shape of the entire conservation area to ensure viability, the following guidance documents have been considered:

- Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region (WALGA 2016);
- *City of Wanneroo Viability Assessment Table* (from *Local Planning Policy 4.3: Public Open Space*; City of Wanneroo 2016); and
- Approved Conservation Advice for Banksia Woodlands of the Swan Coastal Plain TEC (TSSC 2016).

It was determined that the following factors affect viability:

- Size;
- Shape;
- Perimeter to area ratio;
- Condition; and
- Connectivity.

In the context of the proposed contiguous conservation area, efforts have been made to increase the viability where possible. For example; 84% of the vegetation contained within it is considered to



be of Very Good condition. Additionally, the contiguous conservation area is located within the junction of two ecological linkages (Link ID's 6 and 22). Where possible, the perimeter to area ratio has been reduced within the confines posed by the infrastructure within Lot 803.

It should also be noted that the eastern portion of Lot 803 has been identified as a district centre within the CoS Better Suburbs Strategy.

The above offset approach is discussed further within the offset strategy, at Appendix G. Through implementation of the mitigation measures outlined within this supporting document, as well as implementation of the proposed offset strategy, no significant residual environmental impacts are expected to occur as a result of the proposal.



7. Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen-JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen-JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen-JBS&G has also not attempted to determine whether any material matter has been omitted from the data. Strategen-JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen-JBS&G. The making of any assumption does not imply that Strategen-JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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