Environmental Assessment and Management Plan

Australian Hockey Centre, Lot 1884, 208 Kent Street, Bentley

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Executive Summary

The Department of Local Government, Sport and Cultural Industries (DLGSC) (the proponent) through the Department of Finance (DoF) intends to develop the Australian Hockey Centre (AHC) within part Lot 1884, 208 Kent Street, Bentley (herein referred to as 'the site'). The site is located within the Town of Victoria Park (ToVP) and is approximately 10 hectares (ha) in size reflecting the development footprint required to facilitate development of the AHC and associated works. The site is situated within the broader Curtin University Campus land holding and is reserved 'Public purposes – university' under the Metropolitan Region Scheme (MRS) and 'Public purposes – university' under the Town of Victoria Park Local Planning Scheme No. 1 (LPS 1).

The AHC will provide for a world-class, purpose-built AHC through the delivery of four hockey pitches; two of which designed to the best international standards, a specialist goalkeeper training facility, an indoor hockey centre accommodating the Hockey Australia High Performance Program (HAHPP) and extensive recovery, gym and support facilities. The centre will also include a modernised, fit-for-purpose replacement stadium and administrative building. The development will include the construction of playing fields, supporting infrastructure such as change rooms, strength and conditioning spaces, spectator amenity as well as reconfiguration of an existing landscaped public open space areas (integrating retained vegetation with water sensitive urban design features and enhancement of natural features on the site). The AHC Development Plan is provided in **Appendix A.**

This Environmental Assessment Management Plan (EAMP) has been prepared as supporting documentation for a development application to facilitate development of the AHC. The EAMP provides a synthesis of information from a range of sources regarding the environmental features, attributes and values of the site, and presents the actions required to support the management of environmental conditions and assets present across the site and present in adjacent areas.

The relevant environmental attributes and values of the site are summarised as follows:

- The topography of the site is relatively flat with elevations varying from 8 to 10 m Australian Height Datum (AHD) in the carpark and adjacent areas. The existing sunken hockey pitches are at approximately 8 mAHD.
- Based on soil landscape mapping (DPIRD 2023) the soils across the site are characterised by Bassendean sand for up to 6 m below ground level (BGL).
- The site is classified in regional Acid Sulfate Soil (ASS) risk mapping (DWER 2024a) as having a moderate to low risk of ASS occurring within 3 m of the natural soil surface.
- The site was historically cleared of native vegetation prior to 1953, for the purposes of establishing a pine plantation. Some limited vegetation planting has occurred in the north-eastern portion of the site, with scattered established trees throughout. As a result of the historical disturbance, the entirety of the site was identified as being in a 'completely degraded' condition on the Keighery (1994) vegetation condition scale.
- The northeastern portion of the site comprises of 0.07 ha of native vegetation pursuant to the *Environmental Protection Act 1986* (EP Act) associated with a variety of native wetland plant species that fringes around a constructed drainage basin.

- Three threatened black cockatoo species have potential to utilise the site: *Zanda latirostris* (Carnaby's cockatoo); *Zanda baudinii* (Baudin's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo). A *Targeted Black Cockatoo Assessment* (Emerge Associates 2022a) undertaken for the site confirmed the presence of five (5) potential habitat trees for black cockatoo breeding, however none of these contain suitable nesting hollows.
- Foraging habitat for black cockatoos is present within the site. Approximately 2.02 ha of foraging habitat for Carnaby's Black Cockatoo and 0.61 ha of foraging habitat for Forest Red-Tailed Black Cockatoo was identified within the site, comprising of native and non-native plant species, and ranging from high to low quality.
- The northeastern portion of the site contains the Curtin University compensating basin, which is an artificial surface water feature that accepts surface runoff from catchments within the site.
- Based on publicly available groundwater bore data, sourced from the Perth Groundwater Atlas (DWER 2024c), shows the groundwater level is variable across the site, ranging between 7.5 m and 5 m AHD, which is approximately 4 to 6 m below ground level (bgl). The geotechnical investigation observed shallow groundwater beneath the surface which ranged between 3.82 mAHD to 5.0 mAHD (Stantec 2024).
- No geomorphic wetlands (DBCA 2024) are located within the site or adjacent nearby to the site.
- No Registered Aboriginal Heritage Sites (DPLH 2023) are identified to occur within the site.
- No state heritage listed places (Heritage Council WA 2022) were identified or mapped within the site.
- There are no existing land uses in proximity to the site which are incompatible with the proposed AHC development or future use.
- The site is not registered as a contaminated site pursuant to the *Contaminated Sites Act 2003* (DWER 2024b), and historical aerial photography indicates structures were not constructed within the northern portion prior to 1953 and consequently it is unlikely there is any risk of asbestos containing material (ACM) being present.
- The site and surrounding areas are not identified as bushfire prone under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021).

The AHC Development Plan has been developed with consideration to the identified environmental values of the site. A number of design responses have been incorporated into the layout in this regard, including:

- Retention of approximately 1.49 ha of Carnaby's black cockatoo foraging habitat and 0.52 ha of Forest red-tailed black cockatoo foraging habitat, and retention of four (4) black cockatoo potential nesting trees.
- Retention of all native vegetation pursuant to the EP Act within the site.
- Retention of selected trees throughout the site, including several *Corymbia calophylla* (marri), which are habitat trees for black cockatoos, and *Pinus pinaster* (pine), which have high amenity significance.
- Retention of the Curtin University Compensating Basin, which is a surface water feature that accepts runoff from catchments within the site and will provide flood retention capacity.

- Incorporation of native flora/vegetation species into landscaping to maximise fauna habitat and environmental value around the AHC.

The AHC development would involve the following residual impacts within the site:

- The clearing of 0.53ha of Carnaby's black cockatoo foraging habitat and 0.09 ha of Forest Red-tailed Black Cockatoo foraging habitat which comprises a mixture of planted native and non-native species.
- The clearing of one (1) black cockatoo potential nesting tree.
- The removal of 101 trees, which 33 were identified as having a 'high retention value'.

This EAMP outlines the environmental management framework to be implemented across the site as part of the development process, including preparation and implementation of the following:

- Construction Environmental Management Plan.

Overall, the environmental attributes and values of the site have been accommodated within the design and can be managed appropriately in line with the relevant state and local government legislation, policies and guidelines and with appropriate management practices.

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1 Introduction

1.1 Background

Emerge Associates (Emerge) has been engaged by the Department of Local Government, Sport and Cultural Industries (DLGSC) (the proponent), through the Department of Finance (DoF), to provide environmental consultancy services to support the Australian Hockey Centre (AHC). The AHC is proposed to be constructed in a portion of Lot 1884 (on deposited plan 213723), 208 Kent Street, Bentley in the Town of Victoria Park, (herein referred to as 'the site'):

The site comprises a total area of approximately 10.32 hectares (ha) and is reserved 'Public purposes – university' under the Metropolitan Region Scheme (MRS) and 'Public purposes – university' under the Town of Victoria Park Local Planning Scheme No. 1 (LPS 1) (see **Figure 1**). It is bounded by Hayman Road to the north, University Boulevard to the south, Kent Street to the west and Dumas Road to the east. The site is located within Lot 1884 Kent Street, Bentley, and part of a larger land parcel owned by Curtin University, which is located south from the site.

The site is a Crown Reserve (No.27142) with a Management Order to Curtin University of Technology in accordance with the *Curtin University of Technology Act 1996*. The site is currently part of the Curtin University campus consisting of educational and research facilities, sporting grounds and facilities, on-campus accommodation, landscaped gardens and car parking facilities. The intent is to ensure appropriate integration between the AHC and Curtin University.

The AHC will provide for a world-class, purpose-built AHC through the delivery of four hockey pitches; two of which designed to the best international standards, a specialist goalkeeper training facility, an indoor hockey centre accommodating the Hockey Australia High Performance Program (HAHPP) and extensive recovery, gym and support facilities. The centre will also include a modernised, fit-for-purpose replacement stadium and administrative building. The development will include the construction of playing fields, supporting infrastructure such as change rooms, strength and conditioning spaces, spectator amenity as well as reconfiguration of an existing landscaped public open space areas (integrating retained vegetation with water sensitive urban design features and enhancement of natural features on the site).

The site has historically been cleared of native vegetation prior to 1953, having originally been cleared for the purposes of establishing a pine plantation. Since initial remnant native vegetation clearing, evidence of vegetation planting has occurred across the site, with the only area of remnant native vegetation located in the northeastern portion of the site.

1.2 Purpose of this report

This Environmental Assessment Management Plan (EAMP) has been prepared as supporting documentation for a development application to facilitate development of the AHC. The EAMP provides a synthesis of information from a range of sources regarding the environmental features, attributes and values of the site, and presents the management actions required to support the environmental assets present across the site and adjacent areas.

The AHC Development Plan is provided in **Appendix A**.

The purpose of this EAMP is to provide a synthesis of information regarding the environmental values and attributes of the site. Specifically, this report:

- Identifies the existing environmental values and attributes of the site (**Section 2**)
- Discusses the proposal and corresponding environmental approvals (**Section 3**)
- Discusses how the proposed design responds to the existing environment and outlines the environmental management framework (**Section 5**).

The EAMP is the key supporting environmental document for the development application, ultimately facilitating the consideration of environmental issues by the various local and state government agencies and authorities.

1.3 Scope of work

Emerge were engaged by the proponent to undertake an environmental assessment to document the existing environmental attributes and values of the site and ensure relevant environmental values were considered within the AHC Development Plan design. This involved utilising a range of information sources including local and regional reports, databases, mapping and site-specific investigations. The outcomes of these findings include information on the following attributes:

- Landform and soils
- Biodiversity and natural assets, including flora, vegetation and terrestrial fauna
- Hydrology
- Heritage
- Historical and existing land uses within and surrounding the site
- Bushfire hazards.

Existing investigations that have informed the preparation of this report include (but are not limited to):

- *Preliminary Flora, Vegetation and Fauna Assessment State Hockey Centre, Bentley* (Emerge Associates 2022c) (attached as **Appendix B**).
- *Black Cockatoo Habitat Assessment State Hockey Centre, Bentley* (Emerge Associates 2022a) (attached as **Appendix C**).
- *Preliminary Tree Assessment State Hockey Centre, Bentley* (Emerge Associates 2022d)
- *Desktop Hydrological Assessment - State Hockey Centre, Bentley* (Emerge Associates 2022b)
- *Hydrological Design Advice – SD 3.0 State Hockey Centre, Bentley* (Emerge Associates 2024)

2 Existing Environment

2.1 Landform and soils

2.1.1 Topography

The topography of the site is relatively flat with elevation varying from 8 to 10 m Australian Height Datum (AHD) in the carpark and adjacent areas. The existing sunken hockey pitches are approximately at 8 mAHD. Topographic contours across the site and surrounding areas are shown in **Figure 2**.

2.1.2 Landform, soils and geology

Environmental geology for the site has been mapped by the *Geological Survey of Western Australia* (DPIRD 2019). Based on this mapping, the site consists entirely of *S8 – Bassendean Sand*, described as 'white to pale grey at surface, yellow at depth, fine to medium-grained, moderately well sorted, subangular to subrounded quartz, of eolian origin' (see **Figure 3**). These soils typically have high infiltration rates, which can facilitate infiltration at source approaches to stormwater management.

2.1.3 Acid sulfate soils

Acid Sulfate Soils (ASS) is the name commonly given to naturally occurring soils and sediment containing iron sulphide (iron pyrite) materials. In their natural state, ASS is generally present in waterlogged anoxic conditions and do not present any risk to the environment. ASS can present issues when oxidised, producing sulphuric acid, which can impart a range of impacts on the surrounding environment, infrastructure and human health. Projects involving the disturbance of ASS must therefore assess the risk associated with disturbance by considering potential impacts.

Regional ASS risk mapping indicates that the site is classified as having a moderate to low risk of ASS occurring within 3 m of the natural soil surface, as shown in **Figure 4** (DWER 2020a).

2.2 Biodiversity and natural assets

2.2.1 Flora and vegetation

2.2.1.1 Regional context

Native vegetation is described and mapped at different scales in order to illustrate patterns in its distribution. At a continental scale the *Interim Biogeographic Regionalisation of Australia* (IBRA) divides the Swan Coastal Plain into two floristic subregions (Environment Australia 2000).

The site is contained within the Perth subregion of the Swan Coastal Plain, which is characterised as mainly containing *Banksia* low woodland on leached sands within ill-drained *Melaleuca* swamps, and woodland of *Eucalyptus gomphocephala* (tuart), *E. marginata* (jarrah) and *Corymbia calophylla* (marri) on less leached soils (Beard 1990).

At a regional scale, vegetation complex mapping undertaken by Heddle *et al.* (1980) indicates the site occurs within the Bassendean Complex Central and South, which is described as '*Woodland of E. marginata – C. fraseriana – Banksia spp. to low woodland of Melaleuca spp. and sedgelands on the moister sites*'. As of 2018, there was 26.87% of the pre-European extent of the Bassendean Complex remaining on the Swan Coastal Plain (Government of Western Australia 2019).

2.2.1.2 Site specific surveys and investigations

A *Preliminary Flora, Vegetation and Fauna Assessment State Hockey Centre, Bentley* (Emerge Associates 2022c) (attached as **Appendix B**), has been undertaken for the site, with the findings summarised in the sections below.

2.2.1.3 Plant communities

The site has historically been cleared of native vegetation prior to 1953, with vegetation planting having occurred within the site post 1953.

Plant communities identified as part of the survey undertaken by Emerge in April 2022 are listed in **Table 1** and shown in **Figure 5**.

Table 1: Plant communities identified within the site (Emerge Associates 2022c)

Plant community	Description	Area (ha)
Cc	Planted Corymbia calophylla trees over non-native grasses and bare ground	0.07
Pp	Planted *Pinus pinaster trees over non-native grasses and bare ground	1.12
Planted, non-native and native wetland	Planted native species, with variety of non-native and native wetland plants	0.14
Planted and non-native	Planted native and non-native trees including *Corymbia maculata, *Eucalyptus camaldulensis, *Eucalyptus lehmannii, Eucalyptus rudis and Agonis flexuosa and shrubs over non-native grasses and bare ground	1.32
Cleared	Predominantly cleared areas including buildings, hardstand, hockey pitches and turf with occasional planted trees and shrubs	7.66

A total of 0.07 ha of native vegetation as defined under the EP Act, was identified within the site, situated within the northeastern portion consisting of variety of native wetland plant species fringing a constructed drainage basin (as shown in **Figure 5**), which is likely to have naturally regenerated since disturbance. Additionally, scattered planted native trees are found throughout the site, consisting primarily of *Corymbia Calophylla* species but would not be considered native vegetation under the EP Act (as discussed further in **Section 4.1.2**).

2.2.1.4 Vegetation condition

Vegetation condition was assessed across the site as part of the flora surveys, against the methods used in the *Bushland Plant Survey: A guide to plant community survey for the community* Keighery (1994). Detailed descriptions of the vegetation condition ratings are provided in (**Appendix C**). Vegetation condition was confirmed by Emerge in April 2022 and is shown in **Figure 6** with areas listed in **Table 2**.

All five plant communities within the site were classified as being in 'completely degraded' condition in accordance with the Keighery (1994) scale as they are highly disturbed and dominated by non-native species.

Table 2: Vegetation condition and area (Emerge Associates 2022c)

Vegetation condition rating	Area (ha)
Pristine	0
Excellent	0
Very Good	0
Good	0
Degraded	0
Completely degraded	10.32

2.2.1.5 Threatened and Priority Ecological Communities

Generally, ecological communities can be described as vegetation communities that are assemblages of species that occur together in a particular type of habitat. An ecological community's structure, composition and distribution are determined by a range of environmental factors. 'Threatened ecological communities' (TECs) are ecological communities that are recognised as rare or under threat and therefore warrant special protection.

Selected TECs are afforded statutory protection at a Commonwealth level under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). TECs listed under the EPBC Act are categorised as either 'critically endangered', 'endangered' or 'vulnerable'. Any action likely to have a significant impact on a TEC listed under the EPBC Act (either critically endangered or endangered TECs) requires approval from the Commonwealth Minister for the Environment.

Within Western Australia, state-listed threatened flora and TECs are statutorily protected through the *Biodiversity Conservation Act 2016* (BC Act), and licences (or similar) may be required where these values are proposed to be disturbed or modified. In addition to the BC Act, impacts to TECs are considered under the EP Act. The Environmental Protection Authority (EPA) produces environmental factor guidelines to outline how environmental factors are considered by the EPA in the environmental impact assessment. Under the flora and vegetation environmental factor guideline (EPA 2016) TECs are considered to be significant values, and approval may be required from the EPA in order to impact a TEC.

An ecological community under consideration for listing as a TEC in Western Australia, but which does not yet meet survey criteria or has not been adequately defined, or which is rare but not currently threatened, is referred to as a 'priority ecological community' (PEC). Whilst PECs are not afforded statutory protection in Western Australia, they are considered during the approval process.

Flora and Vegetation surveys undertaken across the site confirmed that no threatened or priority ecological communities occur within the site.

2.2.1.6 Significant flora

Certain flora species that are considered to be rare or under threat warrant special protection under Commonwealth and/or State legislation. At a Commonwealth level, flora species may be listed as 'threatened' pursuant to the EPBC Act and any action likely to have a significant impact on a listed threatened species requires approval from the Commonwealth Minister for the Environment.

At a State level, plant species may also be classed as 'threatened' under the BC Act. Species which are potentially rare or threatened, or meet the criteria for near threatened, or have recently been removed from the threatened species list are classed as 'priority' flora species. However, priority flora species are not afforded statutory protection.

The flora surveys undertaken within the site (Emerge Associates 2022c), did not identify any threatened or priority flora. None are considered likely to occur in the site due to the lack of suitable habitat.

2.2.2 Terrestrial fauna

A search of the Department of Climate Change, Environment and Energy (DCCEEW) Protected Matters Search Tool (PMST) identified 65 threatened fauna species, and 49 migratory species listed under the EPBC Act as potentially occurring within the site and/or surrounding 5 km area. Based on the fauna survey and the available habitat within the site, only three of these fauna species are considered to potentially occur within the site:

- *Zanda Baudinii* (Baudin's black cockatoo)
- *Zanda Latirostris* (Carnaby's black cockatoo)
- *Calyptorhynchus banksii naso* (Forest Red-Tailed black cockatoo)

The site is located within the distribution range of Carnaby's black cockatoo and forest red-tailed black cockatoo. However, the site is located outside the Baudin's black cockatoo distribution range (DoEE 2016c, b, a).

A *Black Cockatoo Habitat Assessment State Hockey Centre, Bentley* (Emerge Associates 2022a) (attached as **Appendix C**) was undertaken within the site on 21 April 2022.

Black cockatoos feed on the fruit and seeds of a range of native and non-native plants species. 'Foraging habitat' is defined as vegetation that contains plant species known to be foraged on by black cockatoos. 'Primary' food plants were defined as those with historical and contemporary records of regular consumption by a black cockatoo species. 'Secondary' food plants were defined as plants that black cockatoo species have been recorded consuming occasionally or that, based on their limited extent or agricultural origin, should not be considered a sustaining resource. A list of plant species classified as primary or secondary food plants is provided as Appendix B of *Black Cockatoo Habitat Assessment State Hockey Centre, Bentley* (Emerge Associates 2022a) (attached as **Appendix C**).

The value of foraging habitat was further classified as 'high', 'moderate' or 'low' value based on the proportion of 'primary' or 'secondary' food plants it contained. 'High' value category was defined as

'greater than 50% primary food plants', 'Moderate' value category was defined as 'greater than 10% to 50% primary food plants', and 'low' value defined as '10% or less primary food plants'.

Applying this methodology, the site currently supports:

- A total of 2.02 ha of foraging habitat for Carnaby's black cockatoo was mapped within the site of which 1.33 ha (65.84%) provides a high value resource, 0.45 ha (22.28%) provides a moderate value resource and 0.24 ha (11.88%) provides a low value resource (see **Figure 7**).
- A total of 0.61 ha of foraging habitat for forest red-tailed black cockatoo was mapped in the site of which 0.17 ha (27.87%) provides a high value resource, 0.26 ha (42.62%) provides a moderate value resource and 0.18 ha (29.51%) provides a low value resource (see **Figure 8**).

The site is located outside the Carnaby's black cockatoo modelled breeding range (DoEE 2016b, a). No breeding range information for forest red-tailed black cockatoo is provided in DoEE (2016c). However, on the Swan Coastal Plain the species is known to breed near Baldivis, Mundijong, Stake Hill, Karnup, Murdoch and possibly Perry Lakes (Johnstone *et al.* 2017). Therefore, the site is likely in a suitable location for breeding by this species.

The site contains five (5) habitat trees, comprising of two marri and three flooded gums, none of which contain potentially suitable nesting hollows. Therefore, the site does currently not provide breeding habitat for any species of black cockatoo. The locations of the potential breeding habitat trees are shown in **Figure 9**.

The site supports limited black cockatoo roosting habitat in the form of large native and non-native trees. No evidence of roosting activity such as droppings, feathers or branch clippings were observed during the black cockatoo habitat assessment (Emerge Associates 2022a). A roost-associated with both white-tailed black cockatoos and forest red-tailed black cockatoos occurs approximately 500 m west of the site.

2.2.3 Trees

While the site has been subject to intensive historical disturbance, with the majority of the site supporting non-native vegetation, the site does support a large number of native (planted) and non-native trees. A tree survey and assessment undertaken by Emerge, the site supports 356 trees with a diameter at breast height (DBH) greater than 100mm, of which 133 were rated as having 'high retention value'. These trees included large *Corymbia calophylla* (marri), which qualify as habitat trees for black cockatoos, and *Pinus pinaster* (pine), which were afforded high amenity significance in the context of the Curtin University Campus. The remainder were mostly considered of 'moderate retention value'. Tree retention values for the site are shown below in **Table** 3 and shown on **Figure 10**.

Table 3: Summary of tree retention values recorded within the site

Retention value	No. of trees
High	133 (37.36 %)
Moderate	214 (60.11 %)
Low	9 (2.53 %)

2.2.4 Bush Forever

The Government of Western Australia's *Bush Forever Policy* (Government of WA 2000) is a strategic plan for conserving regionally significant bushland within the Swan Coastal Plain portion of the Perth Metropolitan Region. The objective of Bush Forever is to protect comprehensive representations of all original vegetation complexes by targeting a minimum of 10% of each for protection (Government of WA 2000). Bush Forever sites are representative of regional ecosystems and habitat and have a key role in the conservation of Perth's biodiversity.

The site is not located within a Bush Forever site.

2.2.5 Ecological linkages

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. The movement of fauna and the exchange of genetic material between vegetation remnants improve the viability of those remnants by allowing greater access to breeding partners and food sources, refuge from disturbances such as fire and maintenance of genetic diversity of plant communities and populations. Ecological linkages are ideally continuous or near-continuous as the more fractured a linkage is, the less ease flora and fauna have in moving within the corridor (Alan Tingay and Associates 1998).

The Perth Biodiversity Project, supported by the Western Australia Local Government Association (WALGA), have identified and mapped regional ecological linkages within the Perth Metropolitan Region (WALGA and PBP 2004). This study was extended beyond the Perth Metropolitan Region through the South West Biodiversity Project, resulting in the identification and mapping of the South West regional ecological linkages (Molloy *et al.* 2009).

No regional ecological linkages have been identified as occurring within or adjacent to the site.

2.2.6 Environmentally sensitive areas

'Environmentally sensitive areas' (ESAs) are prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and have been identified to protect native vegetation values of areas surrounding significant, threatened or scheduled flora, vegetation communities or ecosystems. Exemptions under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* do not apply within ESAs.

However, exemptions under Schedule 6 of the EP Act still apply, including any clearing in accordance with a subdivision approval under the *Planning and Development Act 2005* (a recognised exemption under the Schedule 6 of the EP Act).

No ESAs were mapped within or adjacent/ in proximity to the site. In addition, only a limited area of the site supports native vegetation in accordance with the EP Act, the extent of which is shown in **Figure 5**.

2.3 Hydrology

A *Desktop Hydrological Assessment - State Hockey Centre, Bentley* (Emerge Associates 2022b) was undertaken for the site with findings summarised below.

2.3.1 Groundwater

The *Water Register* (DWER 2024d) indicates that aquifers beneath the site are a multi-layered system comprising of the following;

- Perth – Superficial Swan (unconfined)
- Perth – Leederville (confined)
- Perth – Yarragadee North (confined)

Curtin University holds a groundwater licence (GWL45914) for 564,790 kL/year from the Perth Superficial Swan aquifer. There is a current agreement with Curtin University that 20,000 kL/year is provided to the current Hockey Centre, and it is understood that this agreement will be continued in the future development of the AHC site. It is further understood that the site does not contain a groundwater extraction bore, rather the current supply is provided by Curtin University at the boundary to the site.

Based on publicly available groundwater bore data, sourced from the Perth Groundwater Atlas, the groundwater level is variable across the site, ranging between 7.5 m and 5 m AHD, which is approximately 4 to 6 m below ground level (bgl). The *Perth Groundwater Map* (DWER 2024c) shows maximum groundwater levels (MGLs) across the site ranging between 5 mAHD to 7 mAHD, and the groundwater flows in a south westerly direction towards the Canning River. The geotechnical investigation observed shallow groundwater beneath the surface which ranged between 3.82 mAHD to 5.0 mAHD (Stantec 2024).

The groundwater contours and location of the groundwater level observations is shown on **Figure 11**.

2.3.2 Water corporation basin

The Department of Water and Environmental Regulation (DWER) *linear hydrography* spatial dataset (DWER 2020) indicates one compensating basin within the north eastern portion of the site which is operated by the Water Corporation (WC) (**Figure 12**). This basin accepts runoff from catchments within Curtin University, Hayman Road and substantial catchments north of Hayman Road. This basin has a design top water level surface area of 6,856 m2 and provides sufficient flood retention capacity for the currently assumed catchments.

There are four known pipes that discharge into this basin:

- DN675 pipe which provides conveyance from the residential development north of Hayman Road with a downstream invert level of 6.62m.
- A DN460 pipe that runs adjacent to Dumas Road providing conveyance of the stormwater captured along Dumas Road.
- A DN600 pipe discharging into the southern side of the basin.
- A DN300 pipe discharging east from Pitch 2.

2.3.3 Internal site drainage

The northern portion of the current stadium within the site drains to two 1800 x 1200 mm soakwells, with overflow connected to the Pitch 1 drainage system, which in turn overflows into the Curtin University Compensating Basin via the DN600 pipe described above. The southern portion of the building drains into a soakwell to the west via 100 mm PVC pipes and this overflows into a pump pit that connects to the sewer (Arup 2022).

2.3.4 Wetlands

Wetlands are areas which are permanently, seasonally or intermittently waterlogged or inundated with water. Naturally occurring wetland features are common across the Swan Coastal Plain and can contain fresh or salty water, which may be flowing or still.

The DBCA maintains the *Geomorphic Wetlands of the Swan Coastal Plain* database, which categorises geomorphic wetland features into specific management categories based on their attributes and management objectives.

The *Geomorphic Wetlands Swan Coastal Plain dataset* (DBCA 2018) indicates that there are no classified wetlands within the site. The closest classified wetland is a conservation category wetland (CCW) (UFI #15359), associated with the Canning River foreshore located approximately 1.5km south of the site.

2.4 Heritage

2.4.1 Aboriginal heritage

The Aboriginal Cultural Heritage Inquiry System (ACHIS) is maintained pursuant to Section 38 of the *Aboriginal Heritage Act 1972* by the Department of Planning, Lands and Heritage, containing information on Registered Aboriginal Heritages Sites and Other Heritage Places throughout Western Australia.

In accordance with the *Aboriginal Heritage Due Diligence Guidelines* (DAA 2013), a search of the ACHIS online database (DPLH 2023) was undertaken which did not identify any Registered Aboriginal Heritage Sites or Other Heritage Places within the site.

2.4.2 Non-indigenous heritage

A desktop search of the State Heritage Office database (Heritage Council WA 2022) did not identify any state heritage registered places within the site.

2.5 Land use considerations

2.5.1 Historical and existing land uses

A review of publicly available historic aerial imagery (Landgate 2020) indicated that the entirety of the site was cleared of native vegetation prior to 1953 for the purposes of establishing a pine plantation. Since the initial clearing occurred prior to 1953, evidence of scattered planted vegetation has been evident in the north-eastern portion of the site, which first started occurring throughout the late 1970s/ and 1980s. The Curtin University compensating basin was established in the early 1980s. Further clearing for sports ovals, car parks, hockey pitches and associated buildings occurred throughout the 1970s and remained in the same condition to the present time.

2.5.2 Potential site contamination

A review of the DWER *Contaminated Sites Database* indicates that the site is not registered as a contaminated site pursuant to the *Contaminated Sites Act 2003*.

A review of historical aerial photography indicates that limited structures were constructed within the site after 1953, of which are still existing on the site. Based on this, there is little evidence to suggest contamination would be evident within the site.

2.5.3 Surrounding land uses

Land to the south and south-east of the site is zoned 'public purposes – university', land to the west is zoned 'parks and recreation' and land to the north is zoned 'urban' under the MRS. Land to the south and south-east is zoned 'public purposes- university' under the Town of Victoria Park Local Planning Scheme No. 1 (LPS 1), with the land to the north reserved 'special use – Technology park' and land to the west zoned 'public open space'.

There are no land uses identified surrounding the site that would be incompatible with the proposed development of the AHC within the site.

2.6 Bushfire hazard

The site and surrounding areas have been identified as bushfire prone under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021). The identification of a site within an area declared as bushfire prone necessitates that further assessment of the determined bushfire risk of the proposed development is to be undertaken in accordance with *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

The site was not identified as being situated within a bushfire prone area.

3 Proposal

3.1 Proposed development

The AHC Development Plan has been prepared for the site on behalf of the Proponent by Hunt Architecture and is included in **Appendix A**.

The proposed development of the AHC generally seeks to:

- Demolition of the existing Perth Hockey Stadium building.
- Retention of one existing international pitch, and construction of one additional international standard pitch, as well as two additional pitches.
- Construction of a new indoor centre, administration and training and events building.
- Construction of a new stadium accommodating a total of 1,600 spectators, and a high-performance building for the Hockey Australia High Performance Program (HAHPP).
- Construction of a new road connecting Hayman Road to University Boulevard.
- New irrigation, fire and water tanks, service sheds, landscaping, car parking and external concourse areas.
- Encourage pedestrian connection between the AHC and the Curtin Exchange precinct through new pedestrian access ways and landscaping.

The AHC Development Plan incorporates the inputs from a multi-disciplinary project team and the outcomes of a range of site-specific technical studies and investigations, and proposes the following uses:

- Four playing fields, one for training (100 m by 64 m) and one for competitions (130 m by 78 m).
- Indoor centre
- Supporting infrastructure including two-tiered seating stands which will house 600 and 400 permanent seats.
- Main pedestrian corridor access pathways and associated infrastructure (lighting etc).
- Two car parks (located toward the north and south).
- Landscaped public open spaces (POS) areas integrating retained vegetation.
- Water sensitive urban design (WSUD) features.

Specific design considerations to respond to identified environmental values are discussed in detail in **Section 5**.

3.2 Planning engagement / approvals

A development application is being submitted by the proponent for the AHC, to which this EAMP is a supporting document. The development application process has involved discussions with the planning division of DPLH, which have been ongoing and have informed DPLH of the project's progress and confirmation of the development approval pathway. No issues have been identified in the pre-lodgement processes or updates.

The proposal has undergone a design review by the State Design Review Panel (SDRP). One formal meeting has been completed as part of the design review process for the project with follow up engagement with the Government Architect of Western Australia.

The AHC development proposal was presented to the Town of Victoria Park (ToVP) in an engagement session to which the ToVP responded with several queries and recommendations. Some of the relevant comments provided by the ToVP include:

- The need for pedestrian connection across the site
- The need for environmental consideration, with relevance to black cockatoo habitat
- Incorporate shade tree planting in the new car parking areas
- The application should demonstrate the parking supply meets the needs of the facility, as well as the university (assuming that parking area will be shared rather than for the exclusive use of hockey patrons).
- Design recommendations with relation to lighting/ light towers, grandstands, scoreboards, building design, siren noise etc.

3.3 Development impacts

The AHC development proposes the following impact within the site:

- The clearing of 0.53ha of Carnaby's black cockatoo foraging habitat and 0.09 ha of Forest Red-tailed Black Cockatoo foraging habitat which comprises a mixture of native and non-native species. Extent of foraging habitat clearing is shown on **Figure 11**.
- The clearing of a single (1) black cockatoo potential nesting tree (see **Figure 11**).
- The removal of 101 trees as outlined below in **Table 4** and shown in **Figure 12**. Of the trees to be removed, 33 have a 'high retention value'.

Table 4: Tree type removal

Tree type	No. to be cleared	Desirable to retain
Planted Native	2	0
Pine	33	10
Non-native	39	0
Planted Native Eucalypt	19	1
Non-native Eucalypt	8	3

3.4 Hydrological considerations

3.4.1 Stormwater

With the construction of hockey pitches and associated buildings and infrastructure, stormwater drainage will be a primary hydrological consideration. The buildings and structures proposed as part of future AHC development will incorporate pre-existing drainage conveyance with the adoption of

sub surface storage cells to account for stormwater considerations applied to the site. This is further discussed in **Section 5.4.2**.

3.4.2 Irrigation

The two currently existing hockey playing surfaces are irrigated prior to being used with the use of water cannons on each playing surface. The water cannons spray water at 16 L/s for either a 7 or 14 minute cycle depending on the type of pitch use. Each tank has a dedicated 90 kL tank for pitch watering that is connected to a 50 mm bore water and 40 mm scheme water supply (Arup 2022). The currently supplied 20,000 kL is sufficient to meet existing needs, however it is anticipated that the future demand for irrigation water will require approximately 40,000kl with surrounding landscape areas around 11,500 kl.

Water volume that is less than 99,000 kl does not require advertising under the Rights in Water and Irrigation Act 1914 (RIWI Act) and given the site attributes, would be considered low risk. Therefore, the total 51,000 kl required for the site from the superficial aquifer is not considered significant given there is allocation available and a groundwater license currently exists.

Management for irrigation is further discussed in **Section 5.4.3**.

4 Environmental Approvals

The relevant environmental approval considerations for the AHC proposal are summarised below.

4.1 *Environmental Protection Act 1986* (EP Act)

4.1.1 Part IV EP Act – Referral and assessment of proposals

Part IV of the EP Act allows for the referral of proposals to the Environmental Protection Authority (EPA) by the proponent, a decision maker, any member of the public (i.e. third party referrals), and the EPA (via the Chair) also may call in a proposal that hasn't been referred. The EPA may choose to assess a referred proposal, and usually considers significance when making this decision. Proposals that are assessed by the EPA require an approval (referred to as a Ministerial Statement) issued by the Minister for the Environment before they can be implemented.

Based on the existing environmental conditions and context for the site combined with the nature of the AHC proposal, the proposal would not be considered a 'significant proposal'. There are few relevant environmental factors for the site, and the magnitude of potential impacts in relation to these would be quite limited.

4.1.2 Native Vegetation Clearing Permit

Under the EP Act it is an offence to clear native vegetation unless the clearing is done in accordance with a clearing permit, or an exemption applies.

'Native vegetation' as defined in s 3(1) and 51A of the EP Act and Regulations as follows:

Indigenous aquatic or terrestrial vegetation, that includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation.

Native vegetation does not include vegetation that was intentionally sown, planted or propagated (even if this involves indigenous terrestrial plant species), although natural regeneration of previously areas would constitute native vegetation. Clearing vegetation that is not native vegetation for the purposes of the EP Act can be cleared without requiring a clearing permit or exemption.

A total of 0.07 ha of native vegetation as defined under the EP Act, was identified within the site, situated within the northeastern portion consisting of variety of native wetland plant species fringing a constructed drainage basin (as shown in **Figure 5**). Additionally, scattered planted native trees are found throughout the site, consisting primarily of *Corymbia Calophylla* species but would not be considered native vegetation as defined under the EP Act.

Based on the definition of native vegetation and the disturbance footprint of the development, native vegetation is not proposed to be cleared and, on that basis, a clearing permit is not required.

4.2 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The EPBC Act protects listed Matters of Nation Environmental Significance (MNES), and it is an offence to implement any action that would have a significant impact on any MNES. If a proponent believes their proposed action is likely to have a significant impact on any MNES, then they are required to refer this proposal to the federal government (the Department of Climate Change, Energy, the Environment and Water (DCCEEW)), and the Minister (via a delegate) may decide that action is a controlled action that cannot be undertaken until it is approved by the Minister. A proposed action that is determined to be a 'controlled action' is subject to assessment before it is approved.

The AHC development has been assessed using the *EPBC Act Referral guideline for 3 WA threatened black cockatoo species* (DCCEEW 2022), to determine the extent of impact on black cockatoos under the EPBC act. The guidelines provide referral thresholds that can be applied to determine proposed actions that are likely to pose a high risk of significant impacts. These thresholds have been applied in association with the clearing footprint derived for the Australian Hockey Centre proposal as summarised below in **Table 5**.

Table 5: Application of the referral guidelines to future development associated with the disturbance footprint derived for the Australian Hockey Centre

Referral criteria	Carnaby's black cockatoo	Forest red-tailed black cockatoo
Breeding Any loss of / impact upon known, suitable or potential nesting trees	1 potential nesting tree is proposed to be cleared. Given the nesting tree does not support suitable hollows, is not surrounded by foraging habitat, and there is no known breeding in proximity to the site, this is not considered to represent a loss of breeding habitat.	1 potential nesting tree is proposed to be cleared. Given the nesting tree does not support suitable hollows, is not surrounded by foraging habitat, and there is no known breeding in proximity to the site, this is not considered to represent a loss of breeding habitat.
High-quality native foraging habitat Loss of greater than or equal to 1 ha of foraging habitat scoring 5-10 using the foraging quality scoring tool is likely to require referral to the minister.	0.53 ha of foraging habitat would be cleared, which comprises a mixture of native and non-native species, which is not greater than or equal to 1 ha, even if assumed to all comprise high quality native foraging habitat.	0.09 ha of foraging habitat is proposed to be cleared within the site. This is not greater than or equal to 1 ha, even if assumed to all comprise high quality native foraging habitat.
Lower-quality native foraging habitat Loss of greater than or equal to 10 ha of foraging habitat scoring 0-4 using the foraging quality scoring tool is likely to require referral to the minister.	There is no loss of greater or equal to 10ha of foraging habitat in proposed clearing.	There is no loss of greater or equal to 10ha of foraging habitat in proposed clearing. TOWN OF VICTORIA PARK Received: 07/01/2025
Exotic foraging habitat Loss of greater than or equal to 1 ha of predominantly exotic habitat (e.g. Cape Lilac trees and pine trees)	There is no loss of greater than or equal to 1 ha of predominantly exotic habitat. While there are numerous pine trees within the site, the proposed clearing would not result in a loss of exotic foraging habitat greater than or equal to 1 ha within the site.	There is no loss of greater than or equal to 1 ha of predominantly exotic habitat. While there are numerous pine trees within the site, the proposed clearing would not result in a loss of exotic foraging habitat greater than or equal to 1 ha within the site.
Night roosting habitat Removal of any part of a known night roosting site is likely to require referral to the minister.	There is no removal of any known night roosting habitat within the proposed development clearing site.	There is no removal of any known night roosting habitat within the proposed development clearing site.
Summary	**Based on the guidelines, unlikely to be considered a risk of significant impacts to Carnaby's black cockatoo.**	**Based on the guidelines, unlikely to be a risk of significant impacts to forest red-tailed black cockatoo.**

Based on the application of the referral guidelines it would be unlikely that the proposed action as currently considered would pose a high risk of significant impacts to either Carnaby's black cockatoo or forest red-tailed black cockatoo pursuant to the EPBC Act.

While the design proposes the clearing of 1 potential nesting tree (a planted Marri tree), this is not considered a loss of breeding habitat, given it is a single tree, the tree does not support hollows suitable for breeding, there is a lack of extensive foraging habitat in surrounding areas, and there if no known breeding activity in the wider area.

5 Environmental Assessment and Management Framework

This section outlines how the AHC Development Plan has been designed to accommodate the environmental attributes and values associated with the site and details the environmental management considerations required during construction and future operation of the AHC. Only those environmental values and attributes that require specific consideration based on their presence within the site, and/or applicable legislation and policy requirements are assessed.

5.1 Acid sulfate soils

5.1.1 Policy framework, site context and management objectives

The DWER, through the WAPC, ensures ASS are adequately managed during the land use planning and development process. The objective of the DWER's ASS policy framework is to manage ASS appropriately to prevent the release of metals, nutrients and acidity into the soil and groundwater system that may adversely affect the natural and built environment and human health.

The principal management objective for acid sulfate soils within the site is to ensure that any future development that may disturb acid sulfate soils is appropriately managed to avoid impacts on the environment.

5.1.2 Design considerations for acid sulfate soils

ASS management does not require any spatial consideration within the AHC Development Plan, and any ASS risk can be appropriately managed through future environmental management.

5.1.3 Acid sulfate soils management requirements

Based on publicly available groundwater bore data, sourced from the Perth Groundwater Atlas, the groundwater level is variable across the site, ranging between 7.5 m and 5 m AHD, which is approximately 4 to 6 m below ground level (bgl). Assumed foundation and sewer depths are unlikely to be deeper than 6m bgl and as a result dewatering will not likely be required at the site.

5.2 Flora and vegetation

5.2.1 Policy framework and management objective

In the context of environmental impact assessment, the EPA objective for flora and vegetation is '*to protect flora and vegetation so that biological diversity and ecological integrity are maintained*'.

Where a proposal may potentially impact upon flora and vegetation values, the following mitigation hierarchy should be applied to minimise potential impacts:

1. **Avoid** impacts
2. **Minimise** impacts
3. **Offset** impacts.

5.2.2 Design considerations for flora and vegetation

While the vegetation within the site is largely non-native and completely degraded, native vegetation has been recorded within the site and has been considered with regards to spatial responses within the AHC Development Plan.

Through the design process, the outcome of the final AHC Development Plan has resulted in the retention of the entirety of native vegetation (as defined under the EP Act) within the site. Additionally, the AHC development plan has committed to retain a large portion of high retention value trees, including planted *Corymbia calophylla* (marri), which are habitat trees for black cockatoos, and *Pinus pinaster* (pine), which have a high amenity significance.

Vegetation will also be improved through the proposed landscaping of the site which includes native flora/ tree species incorporated into landscaping around the AHC.

5.2.3 Flora and vegetation management requirements

The AHC Development Plan has been designed with efforts to minimise impacts to flora and vegetation. This has been done through the retention of the entirety of native vegetation within the site and a large portion of native trees marked for retention. The project impacts on native vegetation and retained trees will be minimised through:

- Preparation of a Construction Management Plan which would include:
  - Survey of Development Boundary and temporary fencing prior to construction/clearing works to ensure these areas are retained.
  - Within the Development Boundary clear delineation of trees marked for retention and trees marked for clearing
  - Induction for personnel that outlines areas of vegetation retention and how access to these must be restricted.
  - Management measures to minimise impacts from dust or weed encroachment during construction including the cleaning of all machinery prior to site entry and the provision of water carts if required.

During development, the development extent will be temporarily fenced with restricted access and managed by the contractor. Within the development footprint, single trees marked for retention will be delineated and marked accordingly, including Tree Protection Zones (TPZ). The TPZs will be identified protected in line with *AS 4970-2009 Protection of trees on development site*s.

5.3 Terrestrial fauna

5.3.1 Policy framework and management objectives

In the context of environmental impact assessment, the EPA's objective for terrestrial fauna is *'to protect fauna so that biological diversity and ecological integrity are maintained'.* The application of the mitigation hierarchy should be applied to avoid or minimise impacts to terrestrial fauna where possible.

The EPBC Act also provides protection for listed 'threatened' species, including black cockatoos, for which the site contains foraging and potential breeding habitat. Any proposed action which is considered likely to result in a 'significant' impact upon species identified as Matters of National Environmental Significance (MNES) will require referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC act.

Approximately 0.53 ha of Carnaby's black cockatoo foraging habitat and 0.09 ha of forest red-tailed black cockatoo foraging habitat would be cleared, which comprises a mixture of native and non-native species. Additionally, one potential nesting tree is to be cleared. This impact is not considered 'significant' in accordance with the *EPBC Act Referral guideline for 3 WA threatened black cockatoo species* (DoEE 2012).

5.3.2 Design considerations for terrestrial fauna

The AHC development plan has been designed with efforts to minimise impacts to terrestrial fauna. This has been done through the retention of the entirety of native vegetation within the site, as well as a large portion of foraging habitat located in the northern and eastern portions of the site. The final design outcome for the AHC has resulted in the retention of approximately 1.49 ha of Carnaby's black cockatoo foraging habitat and 0.52 ha of Forest red-tailed black cockatoo foraging habitat, including the retention of four (4) black cockatoo potential nesting trees.

5.3.3 Terrestrial fauna management requirements

Throughout development impacts to the fauna habitat will be minimised through:

- Preparation of a Construction Management Plan which is likely to include:
  - Survey of development clearing boundaries and temporary fencing prior to construction/clearing works to ensure these areas are not disturbed during construction works.
  - Induction for personnel that outlines the development zone and how access to these must be restricted.
  - If necessary, the requirement for fauna spotting, trapping and relocation prior to clearing.
  - A pre-clearing fauna inspection to identify potential fauna interactions, including an inspection of trees for hollows and signs of use.
  - A fauna trapping program to capture and translocate small to medium sized (translocatable) native fauna, if such fauna is present and translocation is practical.
  - A fauna spotter will be present during clearing to direct and manage works to avoid impacts to fauna wherever possible and translocate small to medium sized (translocatable) native fauna, if such fauna is present and translocation is practical.

During development, the development footprint will be temporarily fenced including fencing separating the northeastern portion. Restricted access into the site will be managed by the contractor.

Fauna values will also be improved wherever possible within the balance of the site and native flora species incorporated into landscaping to maximise fauna habitat.

5.4 Hydrology

5.4.1 Policy framework and management objective

The *State Water Strategy for Western Australia* (Government of WA 2003) and *Better Urban Water Management* (WAPC 2008) endorse the promotion of integrated water cycle management and application of water sensitive urban design (WSUD) principles to provide improvements in the management of stormwater, and to increase the efficient use of other existing water supplies. Of particular relevance to the wetland habitat that occurs adjacent to the site is the *Better Urban Water Management* criteria for ecological protection, which requires development to maintain or restore desirable environmental flows and/or hydrological cycles.

5.4.2 Design considerations for stormwater management

The AHC Development Plan includes a stormwater management approach, which implements WSUD practices. The characteristics of the site and surrounding stormwater/ drainage infrastructure have been designed and adopted to mimic pre-development hydrology, achieve positive water quality outcomes and to minimise flooding during major storm events.

Emerge provided advice to the design considerations for hydrology within the AHC development, as outlined in the *Hydrological Design Advice – SD 3.0 State Hockey Centre, Bentley* (Emerge Associates 2024). As an outcome of this advice, a summary of the design elements for stormwater management is provided below:

The design criteria for water management within the site include:

Criteria 1 Retain existing outflow connections from the site.

Criteria 2 Retain all runoff up to a 1% AEP event at source, unless an existing connection is available.

Overall, water will be managed by infiltration and existing connections. The design considerations with reference to specific areas within the site (as shown in **Figure 14**) are outlined below:

- **Indoor Centre Administration (ICA)** will adopt subsurface storage.
- **Stadium/High Performance Building (SHPB)** will adopt subsurface storage.
- **Car Park 1 (CP1) – northern area** will require storage for small rainfall events either as soakwells or other subsurface storage cells and these could be under pavement or adjacent areas. In a 1% AEP event there will also be an additional 90 m³ that could either be additional subsurface storage, on the surface pavement (temporary ponding of within carpark areas) or infiltrated within adjacent green spaces (e.g. swales next to the carpark) or a combination thereof.
- **Car Park 3 (CP3) – southern area** will need storage for small rainfall events either as soakwells or other subsurface storage cells and these could be under pavement or adjacent. In a 1% AEP event will also be an additional 85 m³ that could either be additional subsurface storage, on the surface pavement (temporary ponding of within carpark areas) or infiltrated within adjacent green spaces (swales next to the carpark) or a combination thereof.
- **West Pitch** will be accommodated within subsurface storage.

- **South Pitch** will be accommodated within subsurface storage.
- **Arrival Plaza** is assumed to be mostly impermeable, and therefore will be accommodated within subsurface storage.

The North Pitch and East Pitch areas and immediate surrounds are proposed to retain the existing connection to the Water Corporation basin, and therefore these have not been modelled to determine storage requirements. The details of the drainage network for the current existing hockey pitches has previously been provided by Arup (Arup 2022). Drainage of the North pitch is achieved via shedding water to the pitch perimeter into a network of gullies and drainage which is then conveyed to the Curtin University Compensating Basin. East pitch adopts the same drainage approach as north pitch with the perimeter surrounded with gullies and a 300 mm drainage pipe encompassing the pitch. Water is then discharged to the Curtin University Compensating Basin via a 300 mm pipe (Arup 2022). Stormwater management areas for the site is shown on **Figure 14**.

5.4.3 Irrigation strategy

A key component of the AHC Development Plan is sourcing a non-potable water supply for irrigation of playing fields. Following a detailed assessment, the continued use of groundwater is considered to be the most suitable source for the development. Abstraction of groundwater from the superficial aquifer is therefore the proposed source of non-potable supply for the development. Curtin University holds a groundwater licence (GWL45914) for 564,790 kL/year from the Perth Superficial Swan aquifer. There is a current agreement with Curtin University that 20,000 kL/year is provided to the AHC, and it is understood that this agreement will be continued in the future development of the site. It is further understood that the site does not contain a groundwater extraction bore, rather the current supply is provided by Curtin University at the boundary to the site.

It is anticipated that the future demand for irrigation water will require approximately 40,000kl with surrounding landscape areas around 11,500 kl. Water volume that is less than 99,000 kl does not require advertising under the Rights in Water and Irrigation Act 1914 (RIWI Act) and given the site attributes, would be considered low risk. The use of retention and infiltration structures in the stormwater strategy will help to maximise recharge to the superficial aquifer.

5.5 Aboriginal heritage management

As outlined in **Section 2.4.1**, a review of the ACHIS did not identify any recorded Aboriginal heritage sites within the site as defined under Section 5 of the *Aboriginal Heritage Act 1972*. Although no known Aboriginal Cultural Heritage (ACH) was identified or is likely to occur within the site, it is important to note that if during construction Aboriginal heritage artefacts or sites are discovered, these are protected under the AH Act and works should cease and a suitably qualified expert should be brought in to survey the potential site. If required based on the outcome of the survey, the need for permission under the AH Act to manage and disturb sites will need to be resolved.

6 Conclusions

This EAMP has been prepared on behalf of the proponent to support the development application of the AHC in accordance with the AHC Development Plan (**Appendix A**).

The AHC Development Plan has been developed with consideration to the identified environmental values of the site. A number of design responses have been incorporated into the layout in this regard, including:

- Retention of approximately 1.49 ha of Carnaby's black cockatoo foraging habitat and 0.52 ha of Forest red-tailed black cockatoo foraging habitat, and retention of four (4) black cockatoo potential nesting trees.
- Retention of all native vegetation pursuant to the EP Act within the site.
- Retention of selected trees throughout the site, including *Corymbia calophylla* (marri), which are habitat trees for black cockatoos, and *Pinus pinaster* (pine), which have high amenity significance.
- Retention of the Curtin University Compensating Basin, which is a surface water feature that accepts runoff from catchments within the site and will provide flood retention capacity.
- Incorporation of native flora/ vegetation species into landscaping to maximise fauna habitat and environmental value around the AHC.

The AHC development proposes the following impact on values within the site:

- The clearing of 0.53ha of Carnaby's black cockatoo foraging habitat and 0.09 ha of Forest Red-tailed Black Cockatoo foraging habitat which comprises a mixture of native and non-native species.
- The clearing of a single (1) black cockatoo potential nesting tree.
- The removal of 101 trees, which 33 have a 'high retention value'.

This EAMP outlines the environmental management framework to be implemented across the site as part of the development process, including preparation and implementation of the following:

- Construction Environmental Management Plan.

Overall, the environmental attributes and values of the site can be accommodated within the design and can be managed appropriately through the future development applications in line with the relevant state and local government legislation, policies and guidelines and best management practices.

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Figures

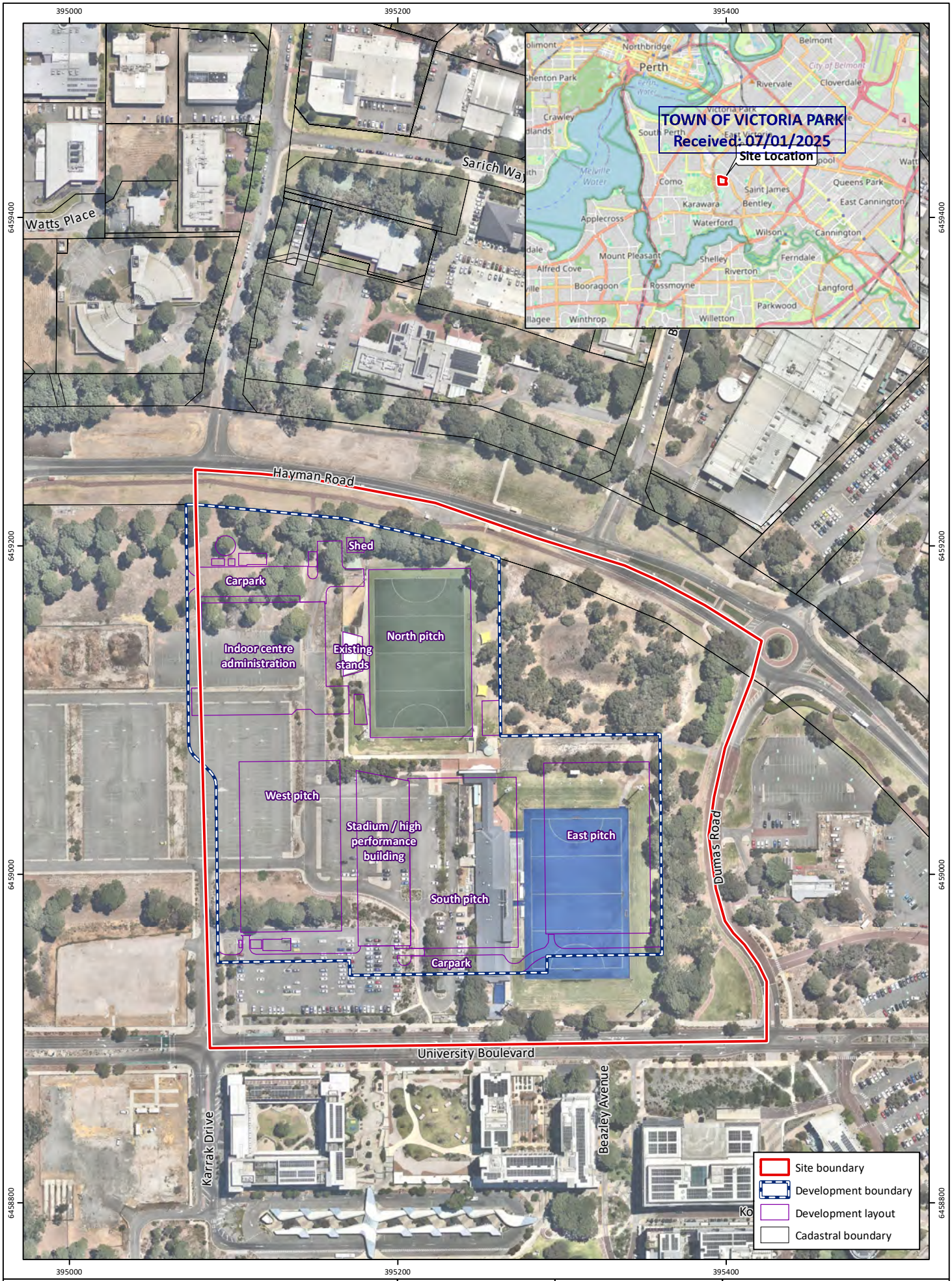

Figure 1: **Site Location**

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F15

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 40 80
Metres
Scale: 1:3,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

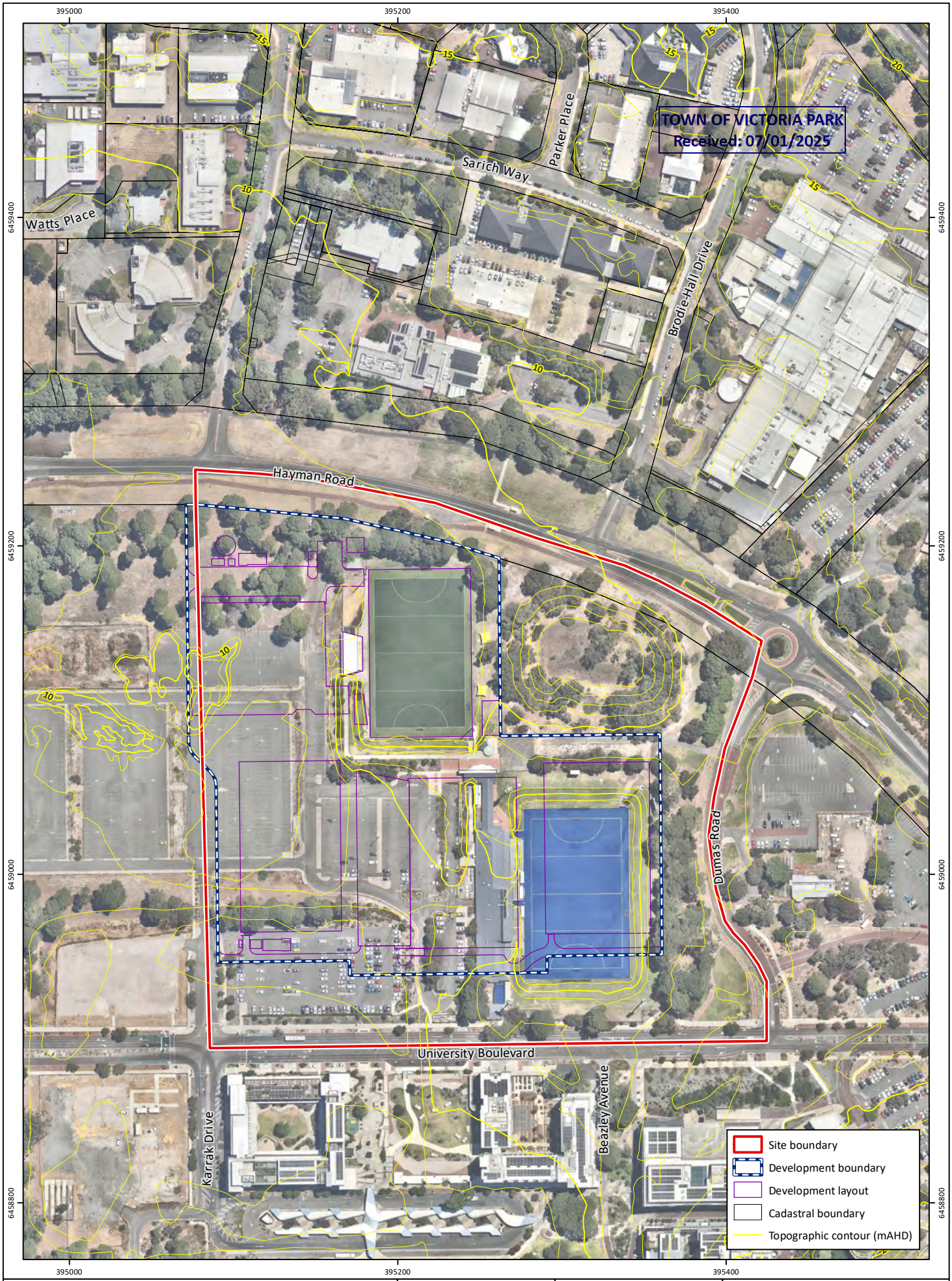

Figure 2: Topographic Contours

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number:
EP23-071(06)--F16

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

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Metres

Scale: 1:3,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

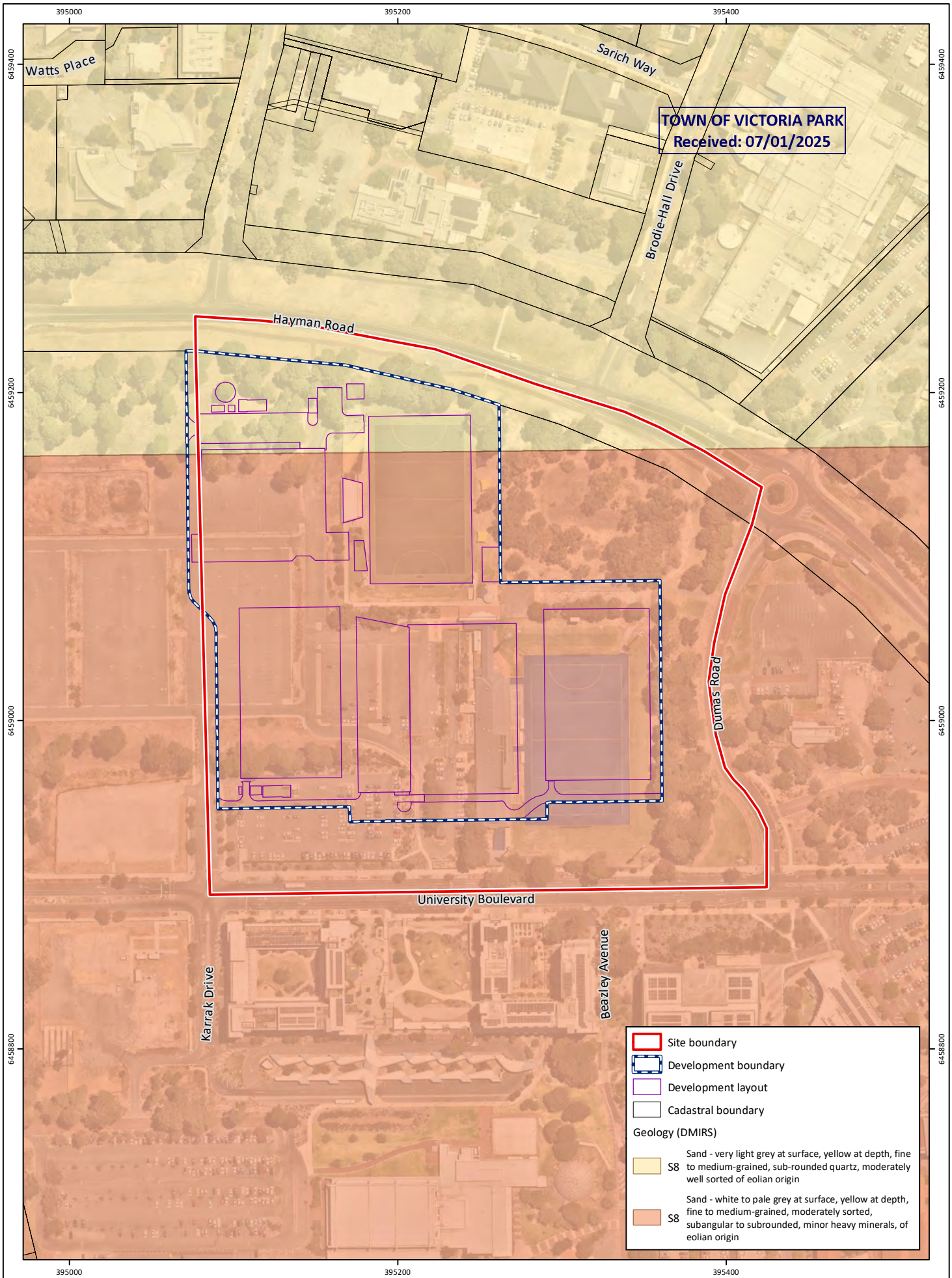

Figure 3: Environmental Geology

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number:
EP23-071(06)--F17

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 40 80
Metres

Scale: 1:3,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

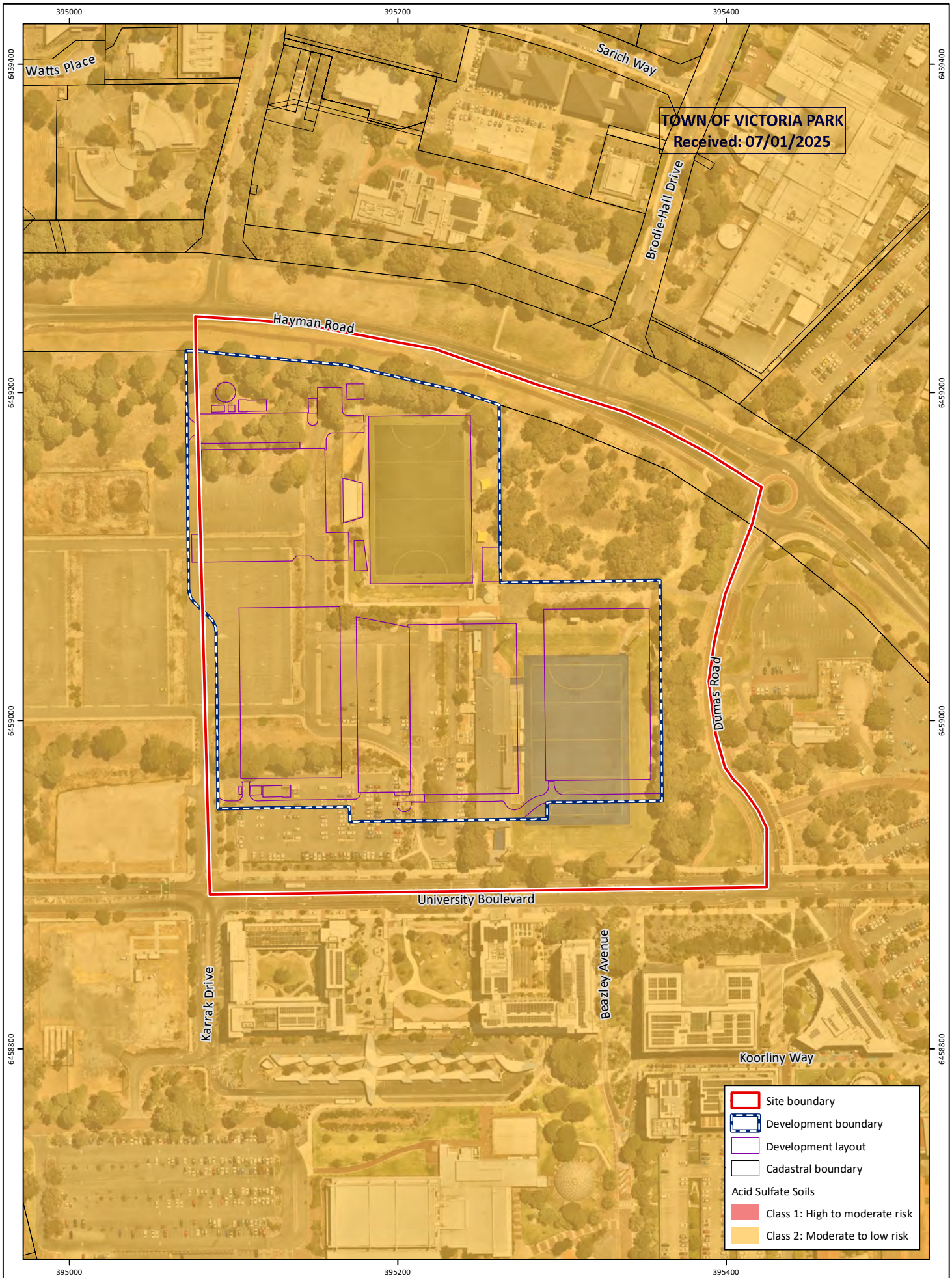

Figure 4: Acid Sulfate Soils

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number:
EP23-071(06)--F18

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

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Metres

Scale: 1:3,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

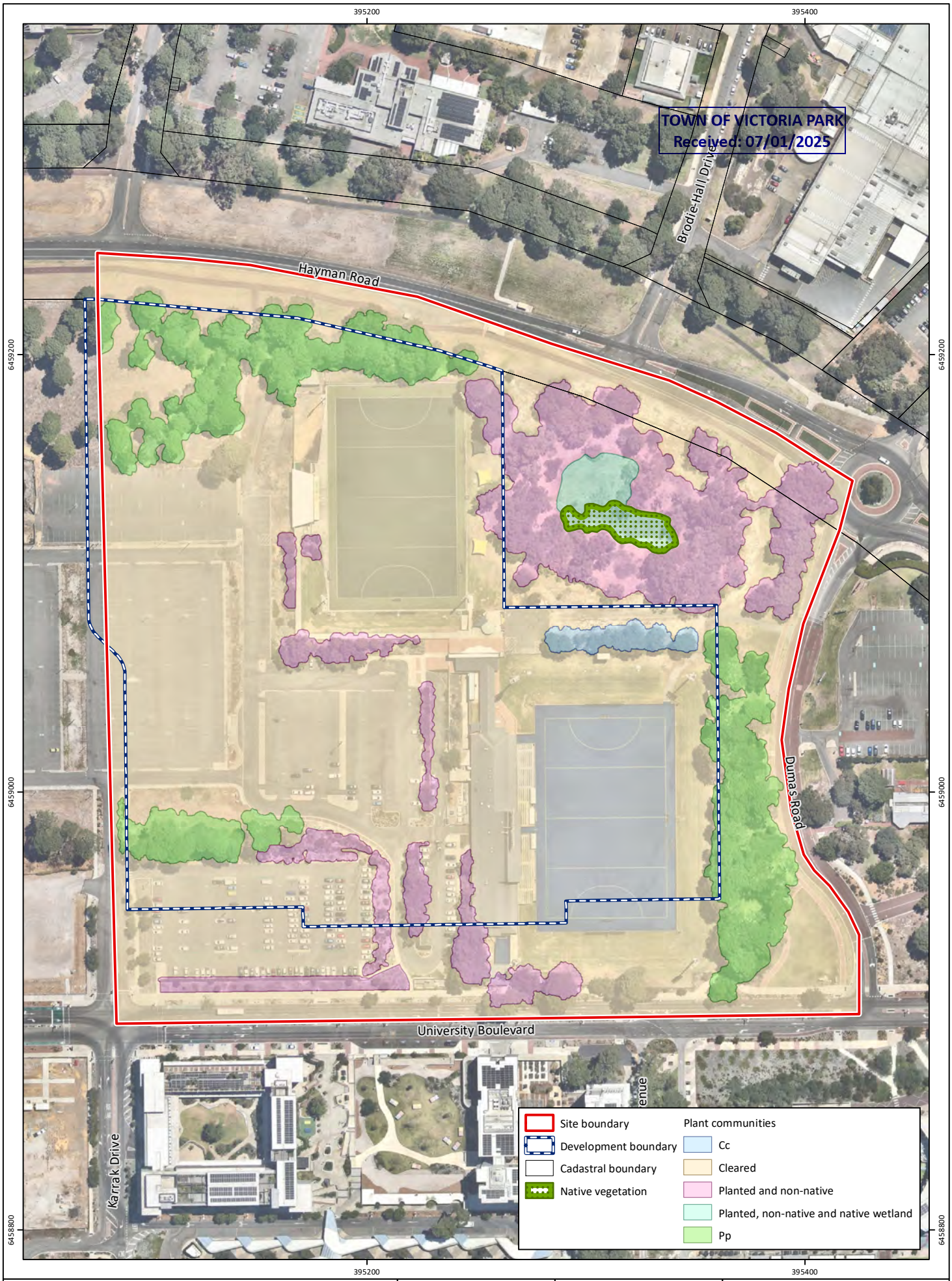

Figure 5: **Plant Communities and Extent of Native Vegetation**

Project: Environmental Assessment and Management Plan
Australian Hockey Centre

Client: Department of Finance

Plan Number: EP23-071(06)--F19

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

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Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

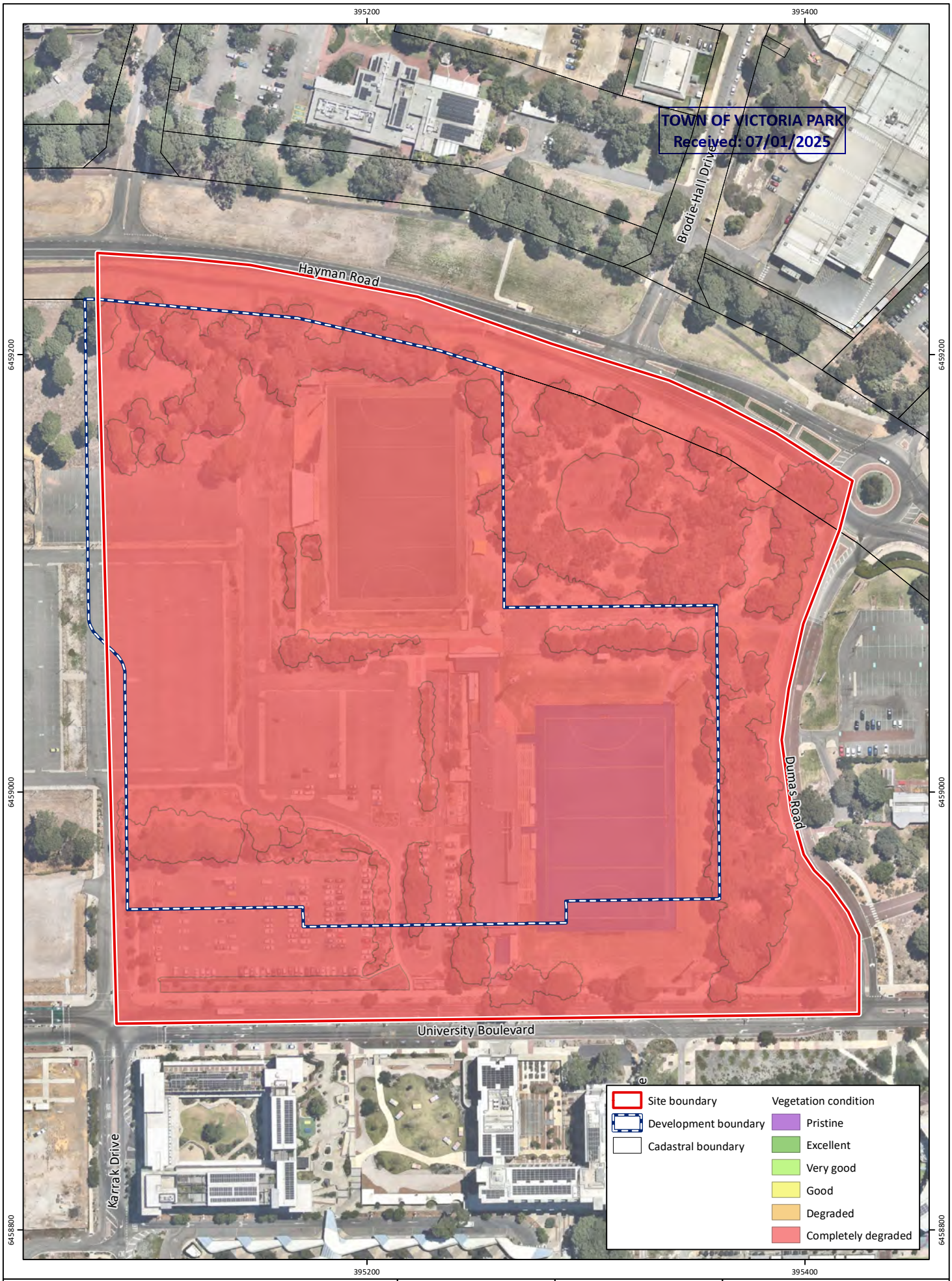

Figure 6: Vegetation Condition

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number:
EP23-071(06)--F20

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

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Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

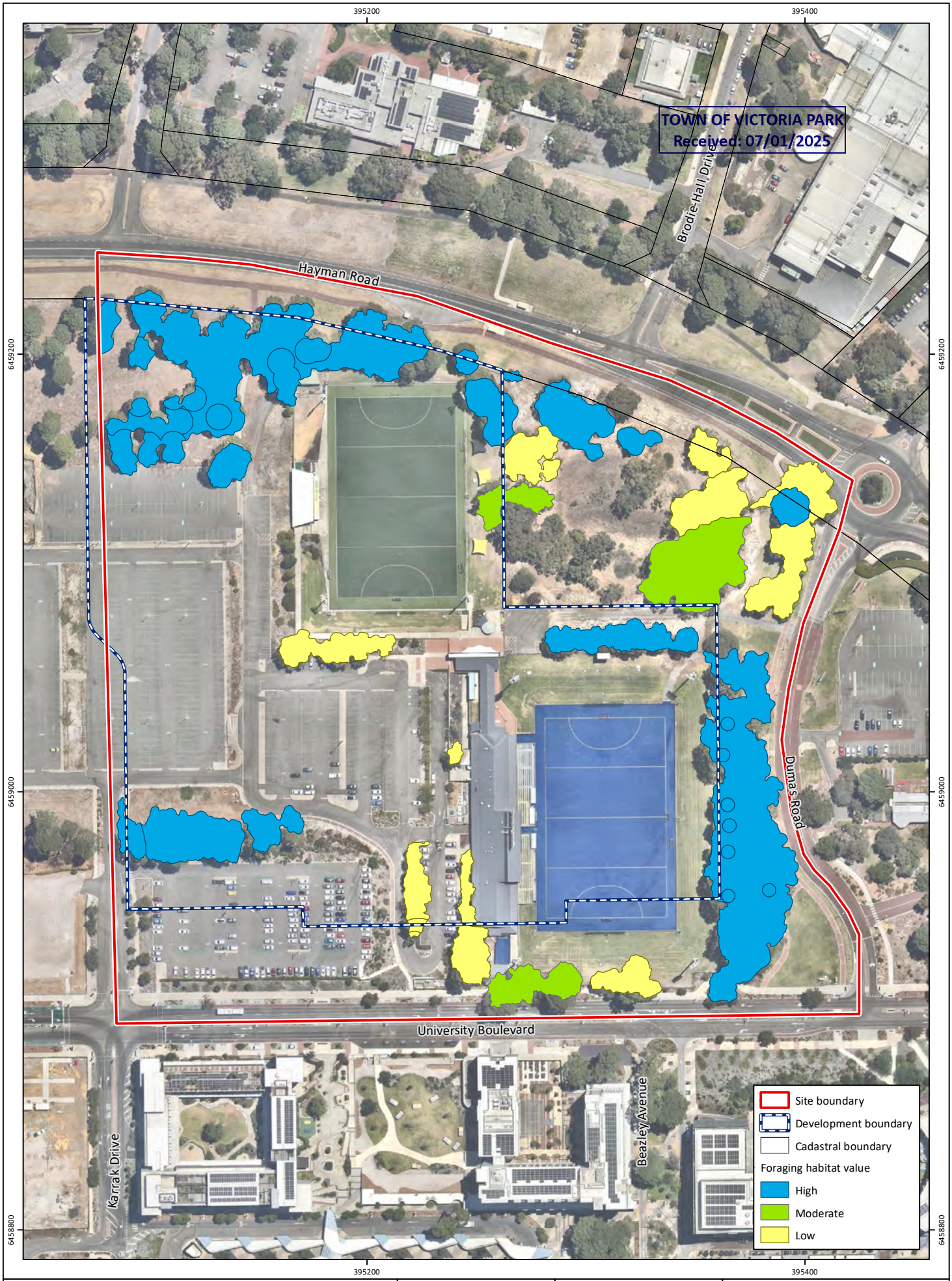

Figure 7: Carnaby's Cockatoo Foraging Habitat

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F21

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 20 40 60
Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

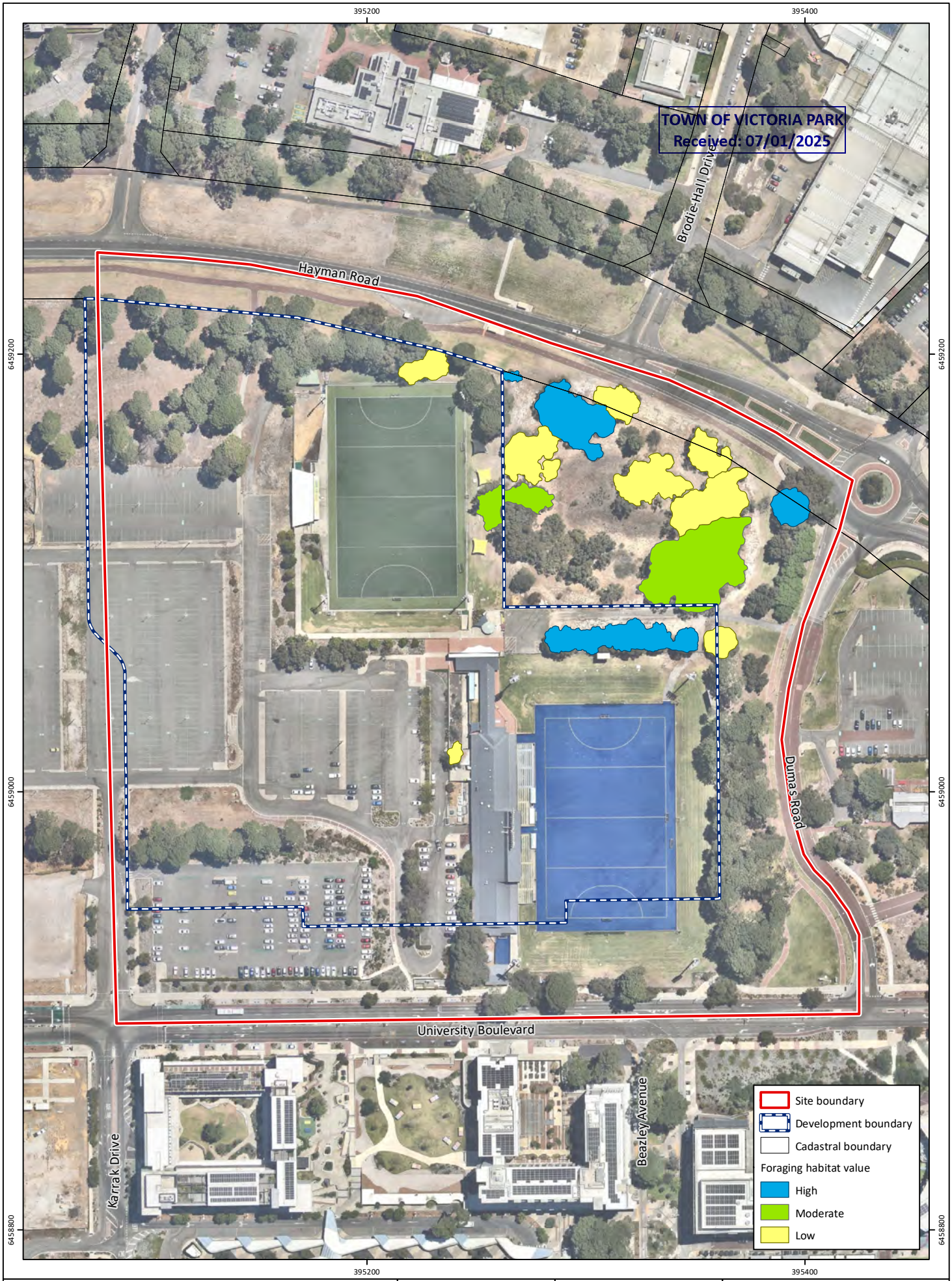

Figure 8: **Forest Red-tailed Black Cockatoo Foraging Habitat**

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F22

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 20 40 60
Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Figure 9: **Black Cockatoo Habitat Trees**

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F23

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

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Metres

Scale: 1:2,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

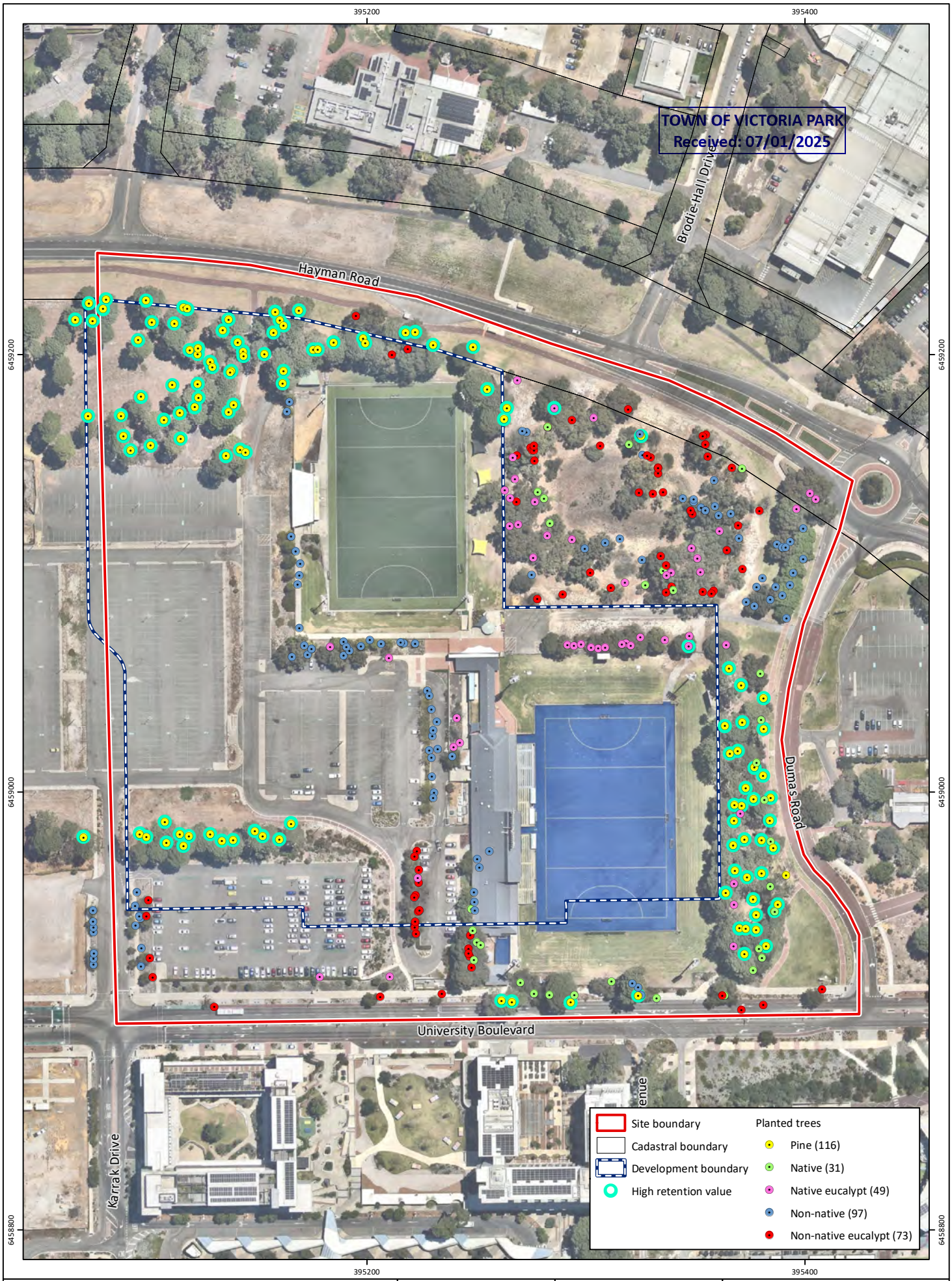

Figure 10: Tree Inventory

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F27

Drawn:	WJC
Date:	23/07/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 20 40 60
Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

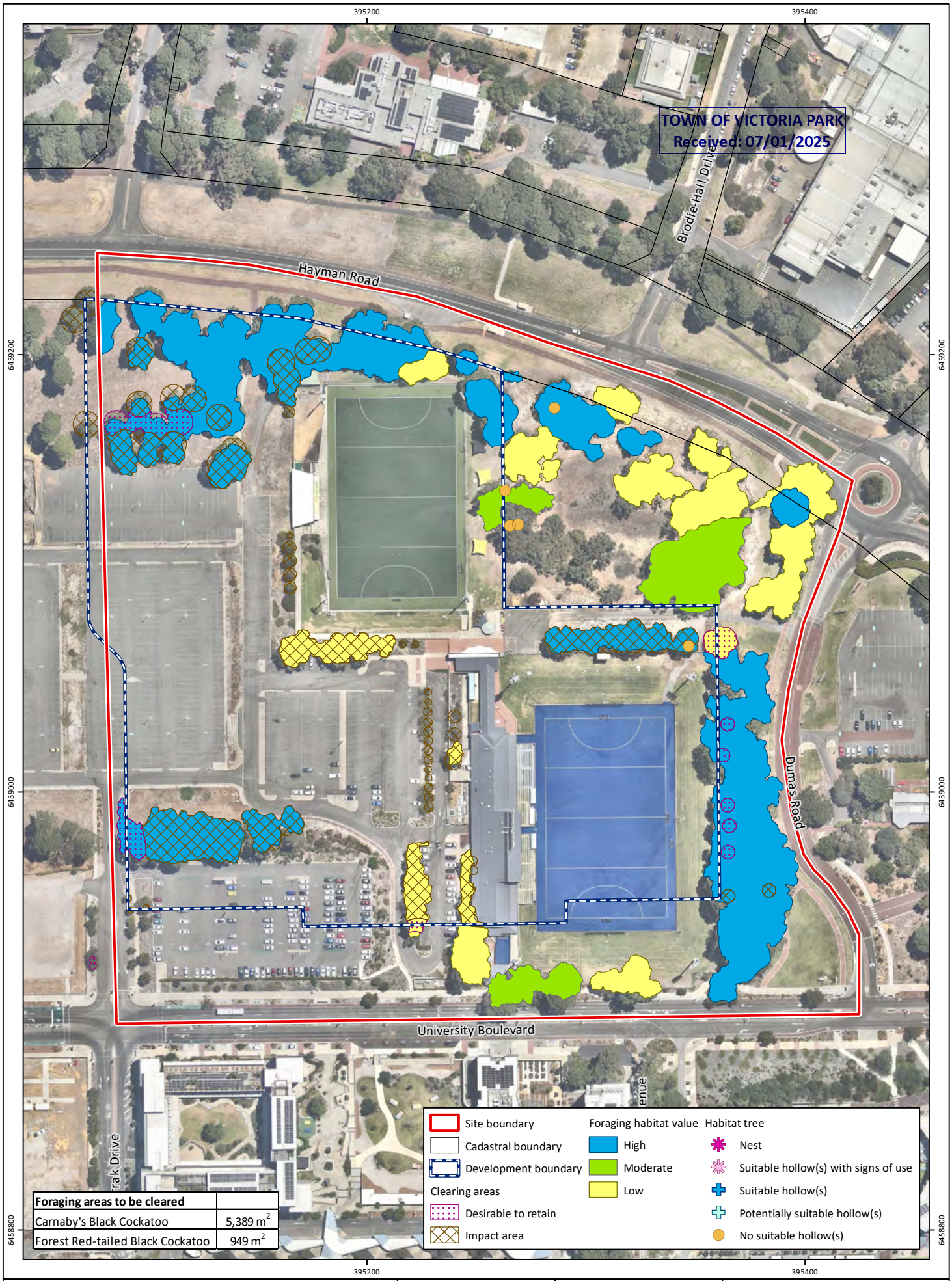

Figure 11: Extent of Foraging Habitat Clearing

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F28
Drawn: WJC
Date: 15/07/2024
Checked: SPL
Approved: JDH
Date: 04/11/2024

N

0 20 40 60
Metres
Scale: 1:2,250@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

Figure 12: Extent of Tree Clearing

Project:	Environmental Assessment and Management Plan Australian Hockey Centre
Client:	Department of Finance

Plan Number:
EP23-071(06)--F29

Drawn:	WJC
Date:	15/07/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 20 40 60
Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

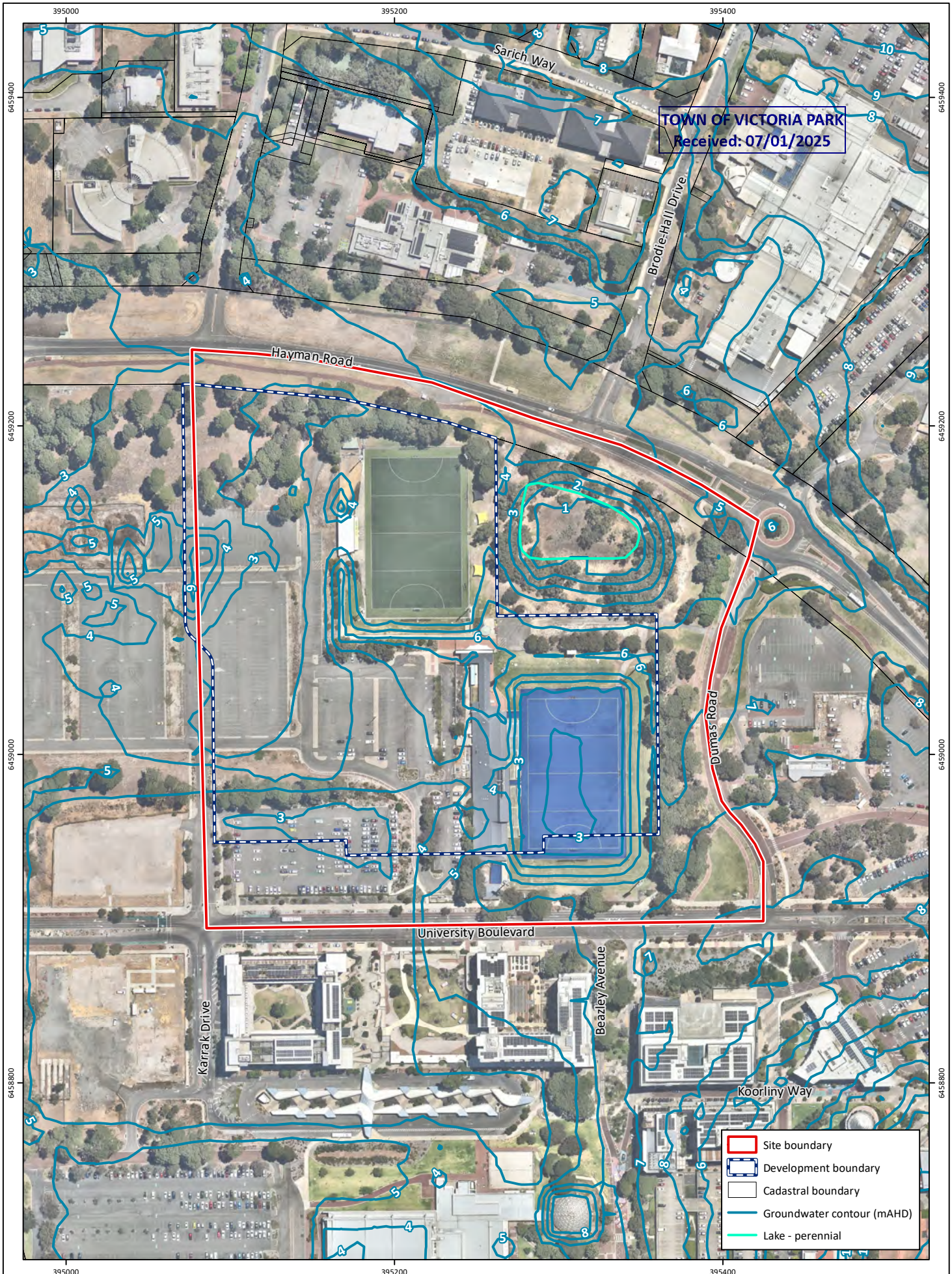

Figure 13: Existing Hydrological Features and Groundwater Levels

Project: Environmental Assessment and Management Plan
Australian Hockey Centre
Client: Department of Finance

Plan Number: EP23-071(06)--F25

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 25 50 75
Metres

Scale: 1:3,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

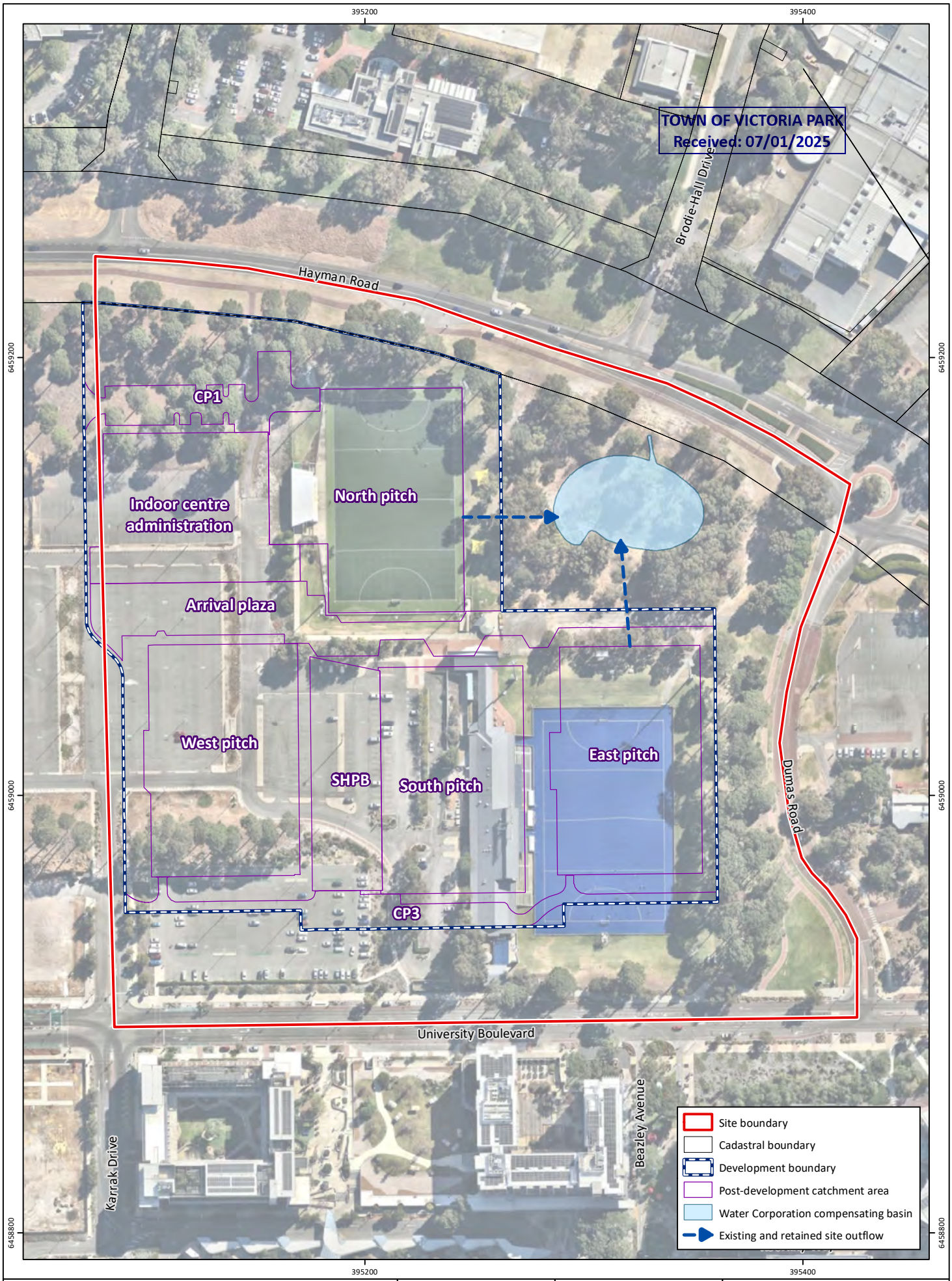

Figure 14: Stormwater Management Plan

Project:	Environmental Assessment and Management Plan Australian Hockey Centre
Client:	Department of Finance

Plan Number:
EP23-071(06)--F26

Drawn:	CTH
Date:	01/11/2024
Checked:	SPL
Approved:	JDH
Date:	04/11/2024

N

0 20 40 60
Metres

Scale: 1:2,250@A4

GDA2020 MGA Zone 50

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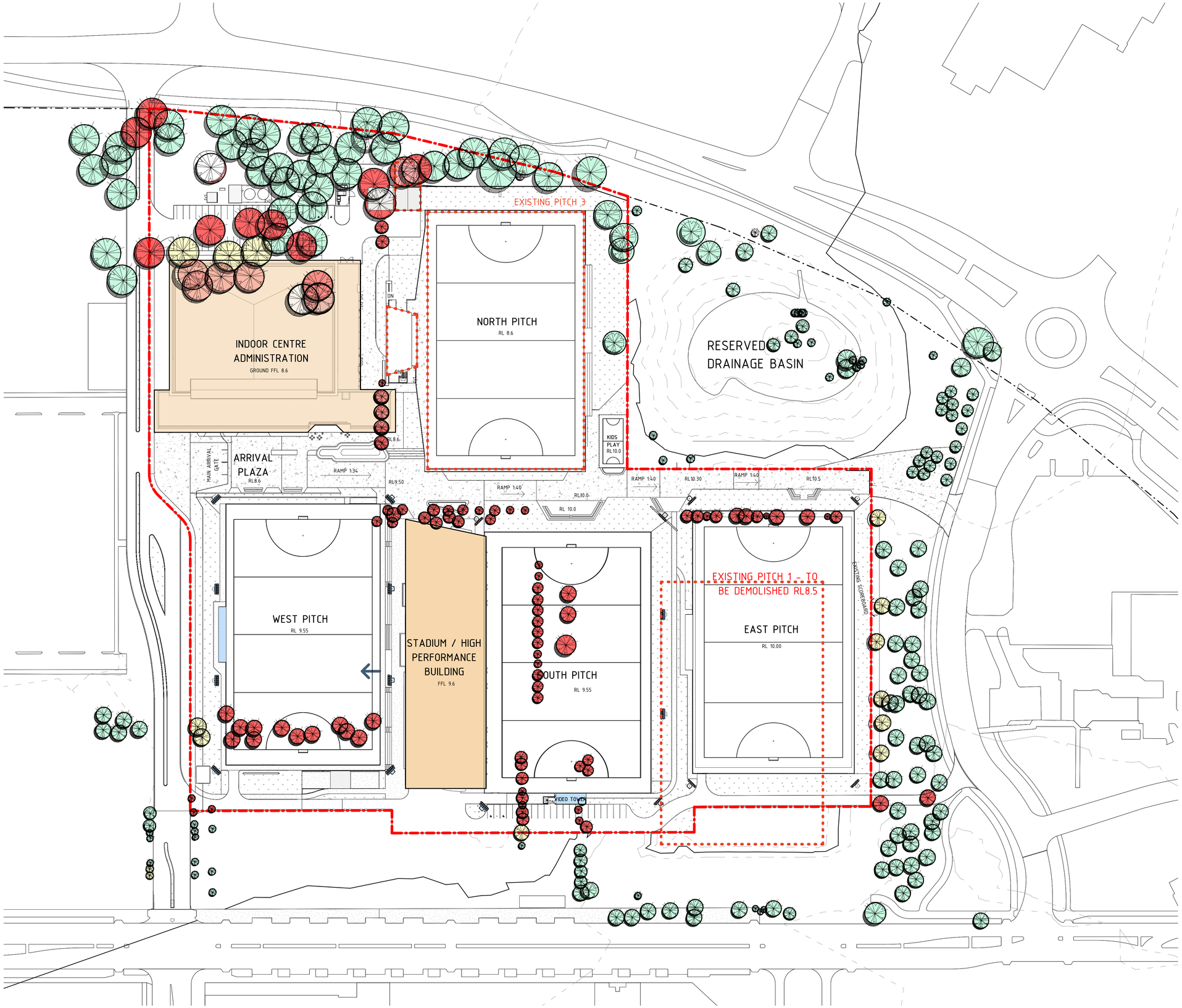
Appendix A

AHC Development Plan (Hunt Architects 2024)

emerge ASSOCIATES



HUNT ARCHITECTS

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+618 9322 6033 perth@huntarchitects.com.au

TREE LEGEND

- DEMOLISH EXISTING TREES
- RETAIN EXISTING TREES
- DESIRABLE TO RETAIN - TBC DESIGN RESOLUTION

CLIENT NAME:
DEPARTMENT OF FINANCE

PROJECT NUMBER:
2310

PROJECT NAME:
AUSTRALIAN HOCKEY CENTRE

PROJECT ADDRESS:
CURTIN UNIVERSITY
KENT ST, BENTLEY WA 6102

DRAWING SCALE:
0m 7.5m 15m 22.5m 30m 37.5m
VISUAL SCALE 1:750 @ A1

NORTH ARROW:
N

DRAWING REVISION:

REV	DATE	DESCRIPTION	BY
A	06.09.2023	ISSUED FOR COORDINATION	SS
B	03.10.2023	SCHEMATIC DESIGN	SS
C	23.02.2024	ISSUED FOR SD COORDINATION	SS
D	01.03.2024	SCHEMATIC DESIGN	SS
E	05.07.2024	ISSUE FOR COORDINATION	SS
F	12.07.2024	SCHEMATIC DESIGN	SS

AUTHOR: TT
CHECKED: SS
APPROVED: SS

DRAWING TITLE:
DIAGRAMS
TREE PROTECTION AREAS

DRAWING STATUS:
SCHEMATIC DESIGN

DRAWING NUMBER: DA-9507
REVISION: F

Appendix B

Preliminary Flora, Vegetation and Fauna Assessment State Hockey Centre, Bentley (Emerge Associates 2022)

TECHNICAL MEMORANDUM
Flora, Vegetation and Fauna Assessment
State Hockey Centre, Bentley

PROJECT NUMBER	EP22-034(02)	**DOC. NUMBER**	EP22-034(02)—003 NAW
PROJECT NAME	State Hockey Centre	**CLIENT**	Department of Finance
AUTHOR	NAW	**REVIEWER**	RAW
VERSION	1	**DATE**	2/06/2022

1. INTRODUCTION

1.1. Project background

Emerge Associates (Emerge) were engaged by Cox Architecture, on behalf of the Department of Finance, to undertake a flora, vegetation and fauna assessment at the Perth Hockey Centre located at Curtin University in Bentley (herein referred to as the 'site').

The site is located approximately 6 kilometres (km) south-east of the Perth Central Business District within the City of Canning. The site extends over approximately 10 hectares (ha) and is bounded by Dumas Road to the east, Hayman Road to the north, Karak Drive and a carpark to the west and University Boulevard to the south. The location of the site is shown in **Figure 1**.

1.2. Purpose and scope of work

The flora, vegetation and fauna assessment was required to support planning and initial design for the proposed State Hockey Centre and the preparation of a Project Definition Plan. Specifically, the scope of work was to provide sufficient detail on the flora, vegetation and fauna values within the site to inform this process.

As part of the scope of work the following tasks were completed:

- Desktop review of relevant background information pertaining to the site and surrounds, including database searches for conservation significant flora, fauna and communities.
- A field survey to record flora, vegetation and fauna values.
- Identification of potential habitat for conservation significant flora and vegetation.
- Documentation of the desktop assessment, methodology, field surveys and results into a report.

2. METHODS

2.1. Desktop assessment

2.1.1. Review historical aerial imagery

A review of historical aerial imagery was completed from 1952 onwards (WALIA 2022).

2.1.2. Database searches

A search was conducted for threatened and priority flora and fauna that may occur or have been recorded within a 10 km radius of the site using *NatureMap* (DBCA 2022), *Protected Matters Search Tool* (DAWE 2022) and the Department of Biodiversity, Conservation and Attraction's (DBCA)

conservation significant fauna and flora databases (reference nos. FAUNA#7162 and 49-0522FL). The results of the PMST search are provided in **Appendix A**.

A search was also conducted for threatened ecological communities (TECs) and priority ecological communities (PECs) that may occur or have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DAWE 2022), DBCA's conservation significant community database (reference no. 49-0522EC) and the weed and native flora dataset (Keighery *et al.* 2012).

Prior to undertaking the field survey, information on the habitat preferences of threatened and priority flora and fauna species and communities identified from database searches were reviewed. This was compared to existing environmental information available for the site, such as geomorphology, soils, regional vegetation and historic land use, to identify species and communities for which habitat may occur in the site.

2.2. Field survey

Two ecologists from Emerge visited the site on 21 April 2022 to conduct the flora, vegetation and fauna field survey. During the survey the site was traversed on foot and the composition of vegetation was recorded.

Plant taxa were systematically recorded as the botanist traversed the site. The representative flora species list focussed on native species and included a limited selection of the non-native species present. Photographs were taken throughout the field visit to show particular site conditions.

Vegetation condition was assigned for each plant community and changes in vegetation condition were also noted and mapped across the site. The condition of the vegetation was assessed using the Keighery (1994) scale (**Table 1**).

The suitability of habitat within the site for conservation significant flora species, plant communities and fauna species was assessed. In particular, vegetation that may provide habitat for threatened species of black cockatoo[1] was recorded.

Table 1: Vegetation condition scale applied during the field assessment

Condition	Definition (Keighery 1994)
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very good	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	Vegetation structure significantly altered by very 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 and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance

[1] *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) and *Zanda latirostris* (Carnaby's cockatoo).

Condition	Definition (Keighery 1994)
	to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

Table 1: Vegetation condition scale applied during the field assessment (continued)

Condition	Definition (Keighery 1994)
Completely degraded	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.

2.3. Mapping and analysis

2.3.1. Vegetation

The plant communities within the site were identified from the data collected during the field survey. The vegetation was described according to the dominant species present using the structural formation descriptions of the *National Vegetation Inventory System* (NVIS) (NVIS Technical Working Group 2017). The identified plant communities were mapped on aerial photography during the field survey and boundaries were interpreted from aerial photography and notes taken in the field. Vegetation condition was mapped on aerial photography based on notes recorded during the field survey to define areas with differing condition.

2.3.2. Threatened and priority ecological community

Areas of native vegetation potentially representing a TEC were assessed against key diagnostic characteristics and, if available, size and/or vegetation condition thresholds.

2.3.3. Fauna habitat

Transects were traversed across the site, during the day, and the characteristics of fauna habitat and presence of fauna species was recorded. Microhabitats such as logs, rocks and leaf litter were investigated and secondary evidence of species presence such as tracks, scats, skeletal remains, foraging evidence or calls was also noted.

3. RESULTS – FLORA AND VEGETATION

3.1. General

Review of historical aerial imagery indicated that the site was once part of the Collier pine plantation and partly cleared between 1977 and 1979 to accommodate the original playing field. Further clearing has taken place since 1979 to further develop the hockey centre with a second playing field added prior to 1989 and car parking facilities from 2002 (WALIA 2022).

This was confirmed during the field survey, with the majority of the site supporting managed turf playing fields and planted vegetation. Based on field survey and historical aerial imagery no remnant native vegetation is considered to occur within the site.

3.2. Flora

3.2.1. Desktop assessment

The database search results identified a total of 33 threatened, 73 priority and one presumed extinct flora species occurring or potentially occurring within a 10 km radius of the site. Information on these species including their habitat preferences and flowering period is provided in **Appendix B**.

Based on background information available for the site, suitable habitat was considered to potentially occur within the site for four threatened and 11 priority flora species as shown in **Table 2**.

Table 2: Conservation significant flora species considered to have potential to occur in the site based on known habitat preferences

Species	Level of significance		Life strategy	Habitat	Flowering period
	State	EPBC Act			
Caladenia huegelii	CR	EN	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov
Macarthuria keigheryi	EN	EN	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec or Feb-Mar
Banksia mimica	VU	EN	P	Flat to gentle slopes in grey and white sand in open woodlands.	Dec-Jan
Conospermum undulatum	VU	VU	P	Sand and sandy clay soils, on flat or gently sloping sites between the Swan and Canning Rivers	May-Oct
Comesperma rhadinocarpum	P2	-	P	Sandy soils.	Oct-Nov
Johnsonia pubescens subsp. cygnorum	P2	-	P	Grey white yellow sands on flats and seasonally wet areas.	Sep
Acacia benthamii	P2	-	P	Sand, typically on limestone breakaways	Aug-Sept
Calectasia grandiflora	P2	-	P	White, grey or yellow sand.	Jun-Nov
Comesperma griffinii	P2	-	A/P	Yellow or grey sand on plains.	Oct
Poranthera moorokatta	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes in banksia woodland.	Sep-early Nov
Babingtonia urbana	P3	-	P	Grey sand, lateritic gravel.	Jan-Mar
Isopogon autumnalis	P3	-	P	Yellow-grey sand.	Feb-Jun
Platysace ramosissima	P3	-	P	Sandy soils.	Oct-Nov
Thysanotus anceps	P3	-	P	White or grey sand, lateritic gravel, laterite.	Oct-Dec
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb

3.2.2. Species inventory

11 native and 20 non-native (weed or planted) species were recorded within the site, representing 11 families and 18 genera. The dominant families recorded were Myrtaceae (three native and 15 planted/non-native taxa) and Fabaceae (three native and one planted/non-native taxa). A species list is provided in **Appendix C**, noting that an exhaustive list of all planted species was not recorded during the site visit.

A number of local native species that have been planted in the site, including *Corymbia calophylla* and *Banksia attenuata.* While endemic within the City of Canning, the individuals of these species are not native vegetation[2] and so have been designated as planted rather than native within **Appendix C**.

A variety of Western Australian native species have been planted within the site, including *Agonis* flexuosa, *Corymbia ficifolia*, and *Eucalyptus camaldulensis*, which are non-endemic (not local) to this part of the Swan Coastal Plain. These species have been recorded as planted, non-native species in **Appendix C**.

3.2.3. Threatened and priority flora

No threatened or priority flora were recorded in the site and none are considered likely to occur in the site due to the lack of suitable habitat or because they were not recorded during the field surveys.

3.2.4. Declared pests

No declared pests (pursuant to the *Biosecurity and Agriculture Management Act 2007*) or weeds of national significance were recorded within the site.

3.3. Vegetation

3.3.1. Desktop assessment

The database search results identified 11 TECs and six PECs as occurring or potentially occurring within a 10 km radius of the site. Information on these communities is provided in **Appendix D**.

Based on geomorphology, soils and regional vegetation patterns, three TECs and two PECs were considered to have potential to occur in the site:

- 'Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))' TEC which is listed as 'endangered' under the EPBC Act and BC Act.
- 'Banksia woodlands of the Swan Coastal Plain' TEC which is listed as 'endangered' under the EPBC Act.
- 'Low lying Banksia attenuata woodlands or shrublands' TEC which is listed as 'endangered' under the EPBC Act.
- 'Banksia woodlands of the Swan Coastal Plain' PEC (P3).
- 'Low lying Banksia attenuata woodlands or shrublands' PEC (P3).

[2] As defined under the *Environmental Protection Act 1986*

3.3.2. Plant communities

Five plant communities were identified within the site. Plant community **Cc** consists of a single row of *Corymbia calophylla* trees planted as a windrow. Plant community **Pp** consists of **Pinus pinaster* trees planted within the northern, western and eastern parts of the site as part of a former pine plantation. Plant community **planted, non-native and native wetland** is a wetland community consisting of variety of planted native species fringing a constructed drainage basin in the north-eastern portion of the site, within which variety of non-native and native wetland plants occur. The remainder of the site supports **planted and non-native** vegetation consisting of vegetation within garden beds and surrounding the constructed drainage basin and **cleared** areas that primarily consist of hardstand and hockey courts.

A description and the area of each plant community is provided in **Table 3** and representative photographs of each are provided in **Plate 1** to **Plate 5**. The location of each plant community is shown in **Figure 2**.

Table 3: Plant communities present within the site

Plant community	Description	Area (ha)
Cc	Planted *Corymbia calophylla* trees over non-native grasses and bare ground (**Plate 1**).	0.07
Pp	Planted **Pinus pinaster* trees over non-native grasses and bare ground (**Plate 2**).	1.12
Planted, non-native and native wetland	Planted native species, with variety of non-native and native wetland plants (**Plate 3**).	0.14
Planted and non-native	Planted native and non-native trees including **Corymbia maculata*, **Eucalyptus camaldulensis*, **Eucalyptus lehmannii*, *Eucalyptus rudis* and *Agonis flexuosa* and shrubs over non-native grasses and bare ground (**Plate 4**).	1.32
Cleared	Predominantly cleared areas including buildings, hardstand, hockey pitches and turf with occasional planted trees and shrubs (**Plate 5**).	7.66

*Plate 1: Plant community **Cc** in 'completely degraded' condition*

*Plate 2: Plant community **Pp** in 'completely degraded' condition*

*Plate 3: Plant community **Planted, non-native and native wetland** in 'completely degraded' condition*

*Plate 4: **Planted and non-native** vegetation in 'completely degraded' condition*

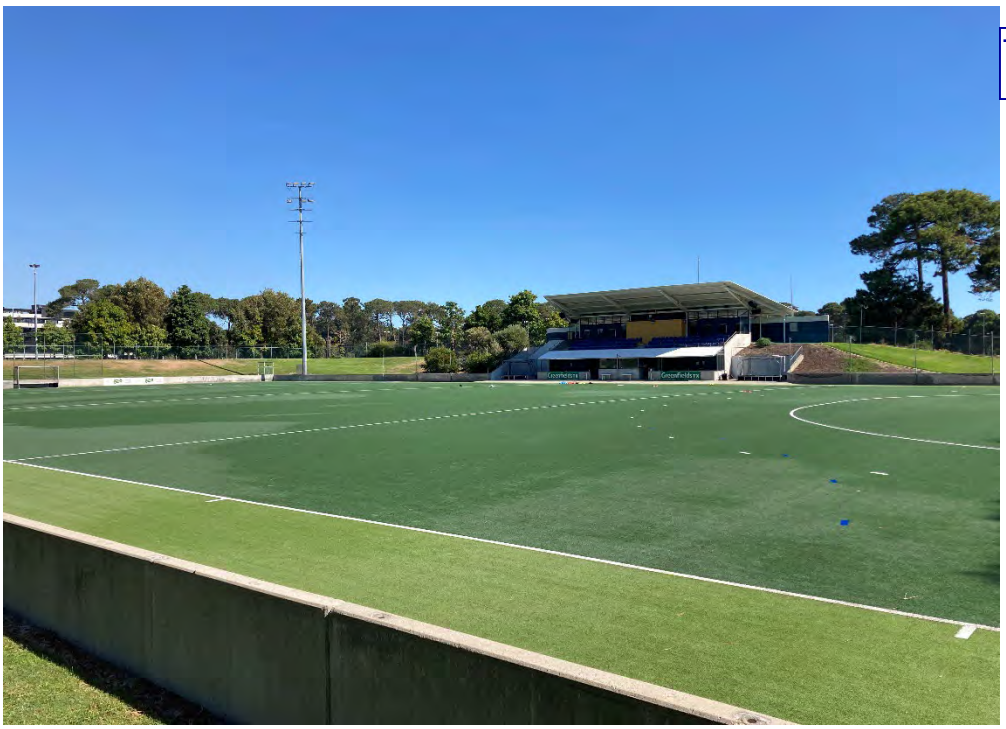

*Plate 5: **Cleared areas** in 'completely degraded' condition*

3.3.3. Vegetation condition

All five plant communities within the site were classified as being in 'completely degraded' condition in accordance with the Keighery (1994) scale as they are highly disturbed and dominated by non-native species. The extent of vegetation by condition category is detailed in **Table 4** and shown in **Figure 3**.

Table 4: Vegetation condition categories within the site

Condition category (Keighery (1994))	Size (ha)
Pristine	0
Excellent	0
Very good	0
Good	0
Degraded	0
Completely degraded	10.32

3.3.4. Threatened and priority ecological communities

No threatened or priority ecological communities occur within the site.

4. RESULTS – FAUNA

4.1. Desktop assessment

The database search results identified 92 fauna species of conservation significance within 10 km of the site, including 40 threatened, 18 priority, 3 specially protected and 50 migratory species. The results of the database searches are provided in **Appendix A**.

Of the 92 conservation significant fauna species, five species were either recorded or considered to possibly occur in the site based on habitat requirements, species distribution and site conditions, as shown in **Table 5**. Fauna species classed as unlikely to occur are listed in **Appendix E**.

Table 5: Summary of conservation significant fauna species recorded or deemed possible or likely to occur within the site

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence within the site
		BC Act	EPBC Act		
Birds					
Apus pacificus	Pacific swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Johnstone and Storr 1998).	**Possible**: May opportunistically occur in or fly over the site on commute but only for short periods of time.
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	VU	*Eucalypt* and *Corymbia* forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding *Corymbia calophylla*, *Eucalyptus marginata*, introduced *Melia azedarach* and *Eucalyptus* spp. trees (Johnstone and Storr 1998).	**Likely**: Suitable roosting and foraging habitat present. Recent records in local area.
Falco peregrinus	Peregrine falcon	MI	MI	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	**Possible**: May opportunistically occur in or fly over the site on commute or while searching for prey but only for short periods of time.
Zanda latirostris	Carnaby's black cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of *Pinus* spp. Attracted to seeding *Banksia* spp., *Dryandra* spp., *Hakea* spp., *Eucalyptus* spp., *Corymbia calophylla*, *Grevillea* spp., and *Allocasuarina* spp. (Johnstone and Storr 1998).	**Recorded**: Observed during field survey. Suitable roosting and foraging habitat present.

4.2. Habitat

The fauna habitat values within the site have been compromised by the removal of the native vegetation and historical degradation.

The scattered trees and shrubs provide some habitat to native fauna and native birds in particular.. The **Pinus* spp. (pine) trees located in the north and eastern portions of the site and Corymbia calophylla (marri) provide a foraging resource for Carnaby's black cockatoo. Habitat values for ground based fauna are generally limited due to lack of remnant native understory vegetation.

The extent of fauna habitat is detailed in **Table 6** and shown in **Figure 4**.

Table 6: Fauna habitats identified within the site

Fauna habitat	Description	Area (ha)
Scattered trees and shrubs	Scattered native and planted non-native trees and shrubs.	2.66
Turf and bare ground	Predominantly turf and bare ground.	7.66

4.3. Species inventory

Seven avifauna species were recorded within the site, including six that are common and widespread, and one that is conservation significant:

- *Anthochaera carunculata* (red wattlebird)
- *Corvus coronoides perplexus* (Australian raven)
- *Cracticus nigrogularis* (pied butcherbird)
- *Gymnorhina tibicen dorsalis* (white-backed magpie)
- *Rhipidura leucophrys leucophrys* (willie wagtail)
- *Trichoglossus moluccanus* (rainbow lorikeet)
- *Zanda latirostris* (Carnaby's cockatoo) (listed as 'endangered' under the EPBC Act and the state *Biodiversity Conservation Act 2016*).

4.4. Threatened and priority fauna

Carnaby's cockatoo was recorded within the site. No other threatened or priority fauna species were recorded at the time of survey.

Five black cockatoo habitat trees[3] were recorded in the site of which none contain hollows suitable for use by black cockatoos for breeding. Therefore, the site does not currently provide breeding habitat for black cockatoos.

Some of the trees within the **scattered trees and shrubs** habitat comprise foraging habitat for black cockatoos. The trees within the site may also provide roosting habitat for black cockatoos.

5. CONCLUSIONS

The site has been subject to intensive historical disturbance, with the majority of the site supporting non-native vegetation.

[3] 'Black cockatoo habitat trees' are defined as native *Eucalyptus* sp./*Corymbia* sp. known to support black cockatoo breeding with a diameter at breast height of at least 500 mm.

5.1. Flora

Eleven (11) native and 20 non-native (weed or planted) species were recorded within the site. No threatened or priority flora were recorded in the site and none are considered likely to occur due to the lack of suitable habitat or because they were not recorded during the field surveys.

5.2. Vegetation

Five plant communities were identified within the site:

- Plant community **Cc** occurs within the eastern portion of the site and consists of a single windrow of *Corymbia calophylla* trees.
- Plant community **Pp** occurs within the northern, eastern and western portions of the site, and are remnants of a historic pine plantation.
- **Planted, non-native and native wetland** vegetation occurs in north east portion of site in association with a constructed drainage basin**.**
- **Planted and non-native** vegetation occurs across the site.
- **Cleared** areas consisting of hardstand and hockey pitches occur across the majority of the site.

No TECs or PECs occur in the site.

5.3. Fauna

Two fauna habitats were identified within the site:

- **Scattered trees and shrubs** is located across the site and contain fauna habitat values primarily for avian species.
- **Turf and bare ground** is located across the majority of the site and offers the lowest fauna habitat values.

Carnaby's black cockatoo was recorded in the site at the time of survey. It is possible that three additional conservation significant species may occur within the site. However, only the forest red-tailed cockatoo is considered likely based on the limited habitat available and relatively small area.

The site provides foraging and roosting habitat for black cockatoos. Five habitat trees without suitable hollows were recorded within the site. The site is likely to be mainly used by common and widespread fauna species.

6. REFERENCES

6.1. General references

Department of Agriculture, Water and the Environment (DAWE) 2022, *Protected Matters Search Tool*, <https://pmst.awe.gov.au/#>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022, *NatureMap*, <https://naturemap.dbca.wa.gov.au/>.

Department of the Environment and Energy (DoEE) 2016, *Banksia Woodlands of the Swan Coastal Plain in Community and Species Profile and Threats Database*, Canberra.

Department of Environment and Energy (DoEE) 2019, *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community*, Canberra.

Keighery, B. 1994, *Bushland Plant Survey: A guide to plant community survey for the community*, Wildflower Society of WA (Inc), Nedlands.

Keighery, B. J., Keighery, G. J., Longman, V. M. and Clarke, K. A. 2012, *Weed and Native Flora Data for the Swan Coastal Plain*, Departments of Environmental Protection and Conservation and Land Management, Western Australia.

NVIS Technical Working Group 2017, *Australian Vegetation Attribute Manual: National Vegetation Information System*, Department of the Environment and Energy, Canberra.

Western Australian Land Information Authority (WALIA) 2022, *Landgate Map Viewer*, <https://map-viewer-plus.app.landgate.wa.gov.au/index.html>.

6.2. Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 6.1**, with access date information provided in **Table R 1**.

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
DAWE (2022)	6 May 2022	Protected Matters Search Tool
DBCA (2022)	6 May 2022	NatureMap
WALIA (2022)	16 May 2022	Landgate Map Viewer

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Figures

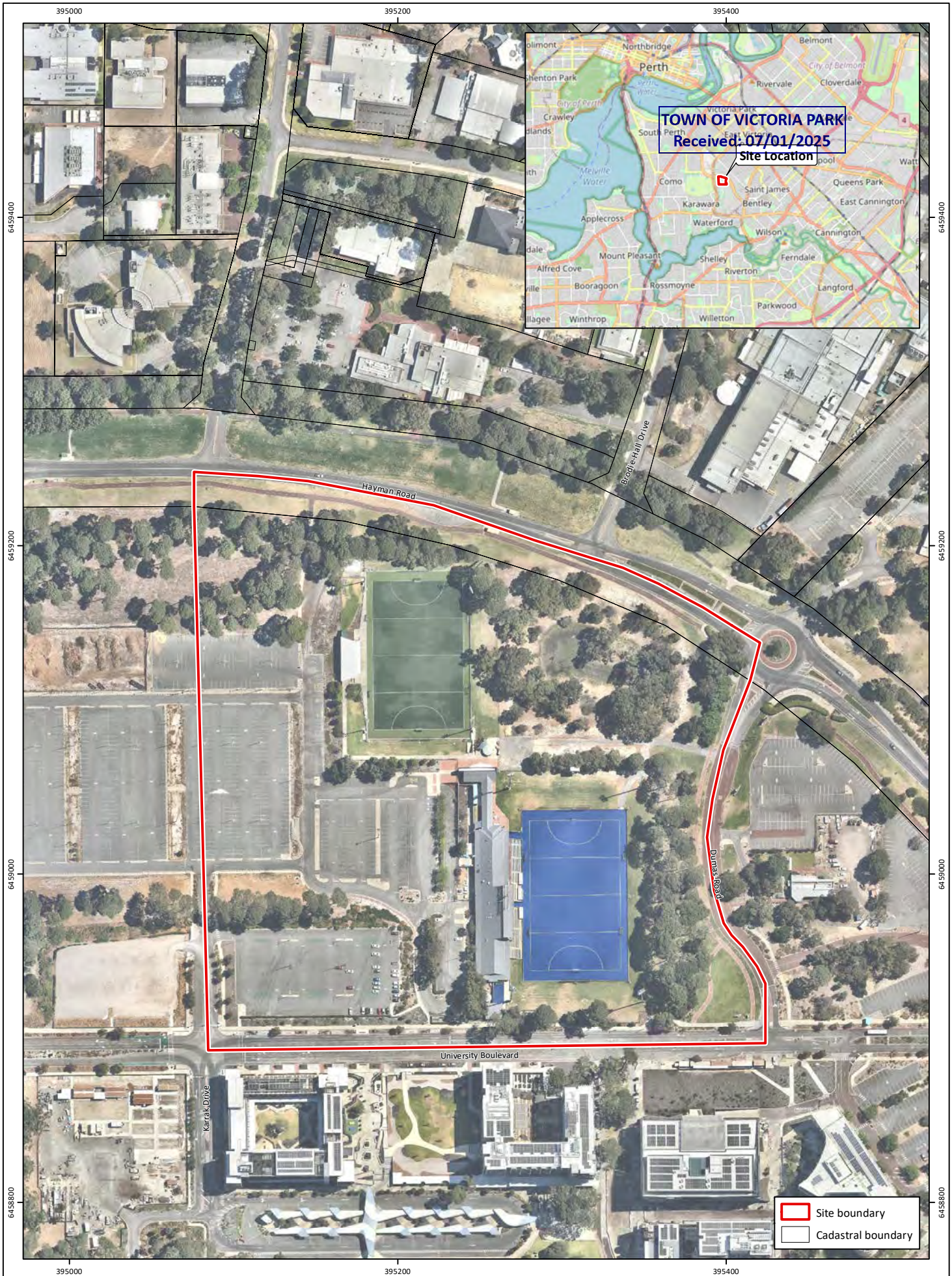

Figure 1: Site Location

Project:	Flora, Vegetation and Fauna Assessment State Hockey Centre
Client:	Department of Finance

Plan Number:
EP22-034(02)--F19

Drawn:	GAR
Date:	02/06/2022
Checked:	TAA
Approved:	TAA
Date:	02/06/2022

N

0 40 80
Metres

Scale: 1:3,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Figure 2: Plant Communities

Project:	Flora, Vegetation and Fauna Assessment State Hockey Centre
Client:	Department of Finance

Plan Number:
EP22-034(02)--F20

Drawn:	GAR
Date:	02/06/2022
Checked:	TAA
Approved:	TAA
Date:	02/06/2022

N

0 25 50
Metres

Scale: 1:2,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

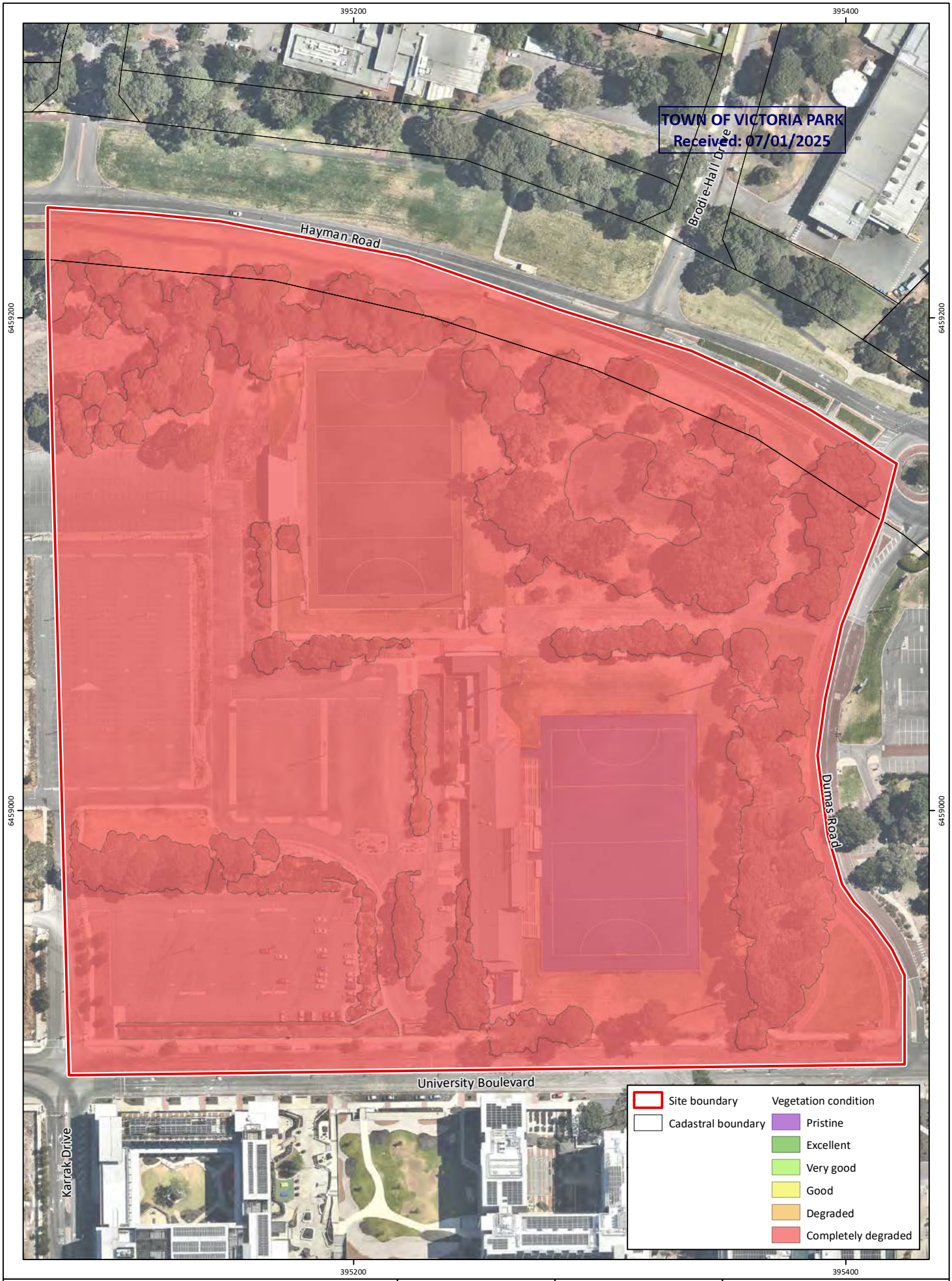

Figure 2: Vegetation Condition

Project: Flora, Vegetation and Fauna Assessment
State Hockey Centre
Client: Department of Finance

Plan Number:
EP22-034(02)--F21

Drawn:	GAR
Date:	02/06/2022
Checked:	TAA
Approved:	TAA
Date:	02/06/2022

N

0 25 50
Metres

Scale: 1:2,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Figure 4: Fauna Habitat

Project:	Flora, Vegetation and Fauna Assessment State Hockey Centre
Client:	Department of Finance

Plan Number:
EP22-034(02)--F22

Drawn:	GAR
Date:	02/06/2022
Checked:	TAA
Approved:	TAA
Date:	02/06/2022

N

0 25 50
Metres

Scale: 1:2,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Appendix A

Database Search Results

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 06-May-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	70
Listed Migratory Species:	50

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	381
Commonwealth Heritage Places:	5
Listed Marine Species:	56
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	21
Regional Forest Agreements:	None
Nationally Important Wetlands:	6
EPBC Act Referrals:	54
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Forrestdale and thomsons lakes	Within 10km of Ramsar site	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In buffer area only
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris tenuirostris](#) Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
[Calyptorhynchus banksii naso](#) Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
[Diomedea amsterdamensis](#) Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Leipoa ocellata](#) Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Limosa lapponica menzbieri](#) Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting known to occur within area	In buffer area only
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thunnus maccoyii](#) Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
INSECT			
[Hesperocolletes douglasi](#) Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Leioproctus douglasiellus](#) a short-tongued bee [66756]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			
[Bettongia penicillata ogilbyi](#) Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Dasyurus geoffroii](#) Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Pseudocheirus occidentalis](#) Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Setonix brachyurus](#) Quokka [229]	Vulnerable	Species or species habitat may occur within area	In buffer area only
OTHER			
[Westralunio carteri](#) Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Acacia anomala](#) Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Andersonia gracilis](#) Slender Andersonia [14470]	Endangered	Species or species habitat known to occur within area	In feature area
[Anigozanthos viridis subsp. terraspectans](#) Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Austrostipa bronwenae](#) [87808]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Austrostipa jacobsiana](#) [87809]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Banksia mimica](#) Summer Honeypot [82765]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Caladenia huegelii](#) King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Calytrix breviseta subsp. breviseta](#) Swamp Starflower [23879]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Chamelaucium sp. Gingin (N.G.Marchant 6)](#) Gingin Wax [88881]	Endangered	Species or species habitat may occur within area	In buffer area only
[Conospermum undulatum](#) Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Diplolaena andrewsii](#) [6601]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat known to occur within area	In feature area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat known to occur within area	In feature area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat known to occur within area	In feature area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area	In buffer area only
Goodenia arthrotricha [12448]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea thelemanniana Spider Net Grevillea [32835]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Lepidosperma rostratum](#) Beaked Lepidosperma [14152]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Macarthuria keigheryi](#) Keighery's Macarthuria [64930]	Endangered	Species or species habitat known to occur within area	In feature area
[Ptilotus pyramidatus](#) Pyramid Mulla-mulla [18216]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
[Synaphea sp. Fairbridge Farm (D. Papenfus 696)](#) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Synaphea sp. Pinjarra Plain (A.S. George 17182)](#) [86878]	Endangered	Species or species habitat may occur within area	In buffer area only
[Thelymitra dedmaniarum](#) Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area	In buffer area only
[Thelymitra stellata](#) Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area	In buffer area only
REPTILE			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Natator depressus](#)			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
SHARK			
[Pristis pristis](#)			
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Sphyrna lewini](#)			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Anous stolidus](#)			
Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
[Apus pacificus](#)			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
[Diomedea amsterdamensis](#)			
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
[Diomedea epomophora](#)			
Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Diomedea exulans](#)			
Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Diomedea sanfordi](#)			
Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Macronectes giganteus](#)			
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Migratory Marine Species			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Mobula birostris as Manta birostris](#) Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Pristis pristis](#) Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Arenaria interpres](#) Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In buffer area only
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area	In buffer area only
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
[Gallinago megala](#) Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
[Gallinago stenura](#) Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Limosa limosa](#) Black-tailed Godwit [845]		Roosting known to occur within area	In buffer area only
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Numenius minutus](#) Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
[Numenius phaeopus](#) Whimbrel [849]		Roosting known to occur within area	In buffer area only
[Pandion haliaetus](#) Osprey [952]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - AIRTC CANNINGTON [50229]	WA	In buffer area only
Defence - AIRTC CANNINGTON [50233]	WA	In buffer area only
Defence - AIRTC CANNINGTON [50230]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - AIRTC CANNINGTON [50232]	WA	In buffer area only
Defence - AIRTC CANNINGTON [50231]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50208]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50209]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50201]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50202]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50206]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50204]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50203]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50207]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50218]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50219]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50216]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50214]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50215]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50213]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50217]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50210]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50211]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50212]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50220]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50223]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50222]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50205]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50228]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50224]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50225]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - HOLDFAST BARRACKS [50221]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50226]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50227]	WA	In buffer area only
Defence - IRWIN BARRACKS - KARRAKATTA [50175]	WA	In buffer area only
Defence - SWAN BARRACKS [50171]	WA	In buffer area only
Unknown		
Commonwealth Land - [51337]	WA	In buffer area only
Commonwealth Land - [51338]	WA	In buffer area only
Commonwealth Land - [51501]	WA	In buffer area only
Commonwealth Land - [51332]	WA	In buffer area only
Commonwealth Land - [51503]	WA	In buffer area only
Commonwealth Land - [51502]	WA	In buffer area only
Commonwealth Land - [51188]	WA	In buffer area only
Commonwealth Land - [51335]	WA	In buffer area only
Commonwealth Land - [51189]	WA	In buffer area only
Commonwealth Land - [51336]	WA	In buffer area only
Commonwealth Land - [51184]	WA	In buffer area only
Commonwealth Land - [51333]	WA	In buffer area only
Commonwealth Land - [51185]	WA	In buffer area only
Commonwealth Land - [51334]	WA	In buffer area only
Commonwealth Land - [51187]	WA	In buffer area only
Commonwealth Land - [51186]	WA	In buffer area only
Commonwealth Land - [51181]	WA	In buffer area only
Commonwealth Land - [51180]	WA	In buffer area only
Commonwealth Land - [51257]	WA	In buffer area only
Commonwealth Land - [51156]	WA	In feature area
Commonwealth Land - [51256]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51255]	WA	In buffer area only
Commonwealth Land - [51254]	WA	In buffer area only
Commonwealth Land - [51259]	WA	In buffer area only
Commonwealth Land - [51258]	WA	In buffer area only
Commonwealth Land - [51345]	WA	In buffer area only
Commonwealth Land - [50842]	WA	In buffer area only
Commonwealth Land - [51347]	WA	In buffer area only
Commonwealth Land - [50687]	WA	In buffer area only
Commonwealth Land - [51340]	WA	In buffer area only
Commonwealth Land - [51253]	WA	In buffer area only
Commonwealth Land - [50685]	WA	In buffer area only
Commonwealth Land - [51252]	WA	In buffer area only
Commonwealth Land - [51349]	WA	In buffer area only
Commonwealth Land - [50843]	WA	In buffer area only
Commonwealth Land - [51251]	WA	In buffer area only
Commonwealth Land - [51348]	WA	In buffer area only
Commonwealth Land - [50849]	WA	In buffer area only
Commonwealth Land - [51250]	WA	In buffer area only
Commonwealth Land - [51155]	WA	In buffer area only
Commonwealth Land - [51273]	WA	In buffer area only
Commonwealth Land - [51270]	WA	In buffer area only
Commonwealth Land - [51981]	WA	In buffer area only
Commonwealth Land - [51277]	WA	In buffer area only
Commonwealth Land - [51274]	WA	In buffer area only
Commonwealth Land - [51271]	WA	In buffer area only
Commonwealth Land - [51339]	WA	In buffer area only
Commonwealth Land - [51276]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51208]	WA	In buffer area only
Commonwealth Land - [51207]	WA	In buffer area only
Commonwealth Land - [51275]	WA	In buffer area only
Commonwealth Land - [51209]	WA	In buffer area only
Commonwealth Land - [51178]	WA	In buffer area only
Commonwealth Land - [51179]	WA	In buffer area only
Commonwealth Land - [51218]	WA	In buffer area only
Commonwealth Land - [51170]	WA	In buffer area only
Commonwealth Land - [50742]	WA	In buffer area only
Commonwealth Land - [51171]	WA	In buffer area only
Commonwealth Land - [50743]	WA	In buffer area only
Commonwealth Land - [51172]	WA	In buffer area only
Commonwealth Land - [51162]	WA	In buffer area only
Commonwealth Land - [51173]	WA	In buffer area only
Commonwealth Land - [50746]	WA	In buffer area only
Commonwealth Land - [50722]	WA	In buffer area only
Commonwealth Land - [51174]	WA	In buffer area only
Commonwealth Land - [51160]	WA	In buffer area only
Commonwealth Land - [50721]	WA	In buffer area only
Commonwealth Land - [51163]	WA	In buffer area only
Commonwealth Land - [50727]	WA	In buffer area only
Commonwealth Land - [51176]	WA	In buffer area only
Commonwealth Land - [51166]	WA	In buffer area only
Commonwealth Land - [50726]	WA	In buffer area only
Commonwealth Land - [51177]	WA	In buffer area only
Commonwealth Land - [51161]	WA	In buffer area only
Commonwealth Land - [51164]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51167]	WA	In buffer area only
Commonwealth Land - [51290]	WA	In buffer area only
Commonwealth Land - [50845]	WA	In buffer area only
Commonwealth Land - [51291]	WA	In buffer area only
Commonwealth Land - [50844]	WA	In buffer area only
Commonwealth Land - [51292]	WA	In buffer area only
Commonwealth Land - [51293]	WA	In buffer area only
Commonwealth Land - [50729]	WA	In buffer area only
Commonwealth Land - [50724]	WA	In buffer area only
Commonwealth Land - [50847]	WA	In buffer area only
Commonwealth Land - [51297]	WA	In buffer area only
Commonwealth Land - [50728]	WA	In buffer area only
Commonwealth Land - [51272]	WA	In buffer area only
Commonwealth Land - [51298]	WA	In buffer area only
Commonwealth Land - [51299]	WA	In buffer area only
Commonwealth Land - [51278]	WA	In buffer area only
Commonwealth Land - [51279]	WA	In buffer area only
Commonwealth Land - [51175]	WA	In buffer area only
Commonwealth Land - [50772]	WA	In buffer area only
Commonwealth Land - [50807]	WA	In buffer area only
Commonwealth Land - [50806]	WA	In buffer area only
Commonwealth Land - [50777]	WA	In buffer area only
Commonwealth Land - [51506]	WA	In buffer area only
Commonwealth Land - [50776]	WA	In buffer area only
Commonwealth Land - [51505]	WA	In buffer area only
Commonwealth Land - [50775]	WA	In buffer area only
Commonwealth Land - [51504]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50774]	WA	In buffer area only
Commonwealth Land - [51311]	WA	In buffer area only
Commonwealth Land - [50778]	WA	In buffer area only
Commonwealth Land - [50860]	WA	In buffer area only
Commonwealth Land - [51310]	WA	In buffer area only
Commonwealth Land - [50809]	WA	In buffer area only
Commonwealth Land - [51509]	WA	In buffer area only
Commonwealth Land - [51508]	WA	In buffer area only
Commonwealth Land - [50823]	WA	In buffer area only
Commonwealth Land - [51507]	WA	In buffer area only
Commonwealth Land - [50741]	WA	In buffer area only
Commonwealth Land - [50862]	WA	In buffer area only
Commonwealth Land - [50861]	WA	In buffer area only
Commonwealth Land - [51194]	WA	In buffer area only
Commonwealth Land - [51193]	WA	In buffer area only
Commonwealth Land - [50723]	WA	In buffer area only
Commonwealth Land - [51196]	WA	In buffer area only
Commonwealth Land - [51316]	WA	In buffer area only
Commonwealth Land - [51195]	WA	In buffer area only
Commonwealth Land - [51317]	WA	In buffer area only
Commonwealth Land - [51314]	WA	In buffer area only
Commonwealth Land - [51315]	WA	In buffer area only
Commonwealth Land - [51312]	WA	In buffer area only
Commonwealth Land - [51313]	WA	In buffer area only
Commonwealth Land - [51295]	WA	In buffer area only
Commonwealth Land - [51296]	WA	In buffer area only
Commonwealth Land - [51190]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51294]	WA	In buffer area only
Commonwealth Land - [51192]	WA	In buffer area only
Commonwealth Land - [51191]	WA	In buffer area only
Commonwealth Land - [50814]	WA	In feature area
Commonwealth Land - [51421]	WA	In buffer area only
Commonwealth Land - [51422]	WA	In buffer area only
Commonwealth Land - [50812]	WA	In buffer area only
Commonwealth Land - [50817]	WA	In feature area
Commonwealth Land - [51198]	WA	In buffer area only
Commonwealth Land - [51199]	WA	In buffer area only
Commonwealth Land - [51197]	WA	In buffer area only
Commonwealth Land - [51211]	WA	In buffer area only
Commonwealth Land - [51210]	WA	In buffer area only
Commonwealth Land - [51217]	WA	In buffer area only
Commonwealth Land - [51281]	WA	In buffer area only
Commonwealth Land - [51426]	WA	In buffer area only
Commonwealth Land - [51356]	WA	In buffer area only
Commonwealth Land - [51283]	WA	In buffer area only
Commonwealth Land - [51425]	WA	In buffer area only
Commonwealth Land - [51282]	WA	In buffer area only
Commonwealth Land - [51213]	WA	In buffer area only
Commonwealth Land - [51285]	WA	In buffer area only
Commonwealth Land - [51212]	WA	In buffer area only
Commonwealth Land - [51284]	WA	In buffer area only
Commonwealth Land - [51287]	WA	In buffer area only
Commonwealth Land - [51286]	WA	In buffer area only
Commonwealth Land - [51168]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51169]	WA	In buffer area only
Commonwealth Land - [51215]	WA	In buffer area only
Commonwealth Land - [51165]	WA	In buffer area only
Commonwealth Land - [50850]	WA	In buffer area only
Commonwealth Land - [50859]	WA	In buffer area only
Commonwealth Land - [50759]	WA	In buffer area only
Commonwealth Land - [51423]	WA	In buffer area only
Commonwealth Land - [50758]	WA	In buffer area only
Commonwealth Land - [50750]	WA	In buffer area only
Commonwealth Land - [51139]	WA	In buffer area only
Commonwealth Land - [51136]	WA	In buffer area only
Commonwealth Land - [51427]	WA	In buffer area only
Commonwealth Land - [51138]	WA	In buffer area only
Commonwealth Land - [51133]	WA	In buffer area only
Commonwealth Land - [51910]	WA	In buffer area only
Commonwealth Land - [51137]	WA	In buffer area only
Commonwealth Land - [51135]	WA	In buffer area only
Commonwealth Land - [50755]	WA	In buffer area only
Commonwealth Land - [50756]	WA	In buffer area only
Commonwealth Land - [51323]	WA	In buffer area only
Commonwealth Land - [50754]	WA	In buffer area only
Commonwealth Land - [50757]	WA	In buffer area only
Commonwealth Land - [51320]	WA	In buffer area only
Commonwealth Land - [51327]	WA	In buffer area only
Commonwealth Land - [51322]	WA	In buffer area only
Commonwealth Land - [51321]	WA	In buffer area only
Commonwealth Land - [51325]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51219]	WA	In buffer area only
Commonwealth Land - [51214]	WA	In buffer area only
Commonwealth Land - [51914]	WA	In buffer area only
Commonwealth Land - [51915]	WA	In buffer area only
Commonwealth Land - [51916]	WA	In buffer area only
Commonwealth Land - [51917]	WA	In buffer area only
Commonwealth Land - [51918]	WA	In buffer area only
Commonwealth Land - [51183]	WA	In buffer area only
Commonwealth Land - [51182]	WA	In buffer area only
Commonwealth Land - [51147]	WA	In buffer area only
Commonwealth Land - [51498]	WA	In buffer area only
Commonwealth Land - [51146]	WA	In buffer area only
Commonwealth Land - [51145]	WA	In buffer area only
Commonwealth Land - [51144]	WA	In buffer area only
Commonwealth Land - [51143]	WA	In buffer area only
Commonwealth Land - [51142]	WA	In buffer area only
Commonwealth Land - [51141]	WA	In buffer area only
Commonwealth Land - [51140]	WA	In buffer area only
Commonwealth Land - [51920]	WA	In buffer area only
Commonwealth Land - [51911]	WA	In buffer area only
Commonwealth Land - [51913]	WA	In buffer area only
Commonwealth Land - [51912]	WA	In buffer area only
Commonwealth Land - [51417]	WA	In buffer area only
Commonwealth Land - [51414]	WA	In buffer area only
Commonwealth Land - [51899]	WA	In buffer area only
Commonwealth Land - [51416]	WA	In buffer area only
Commonwealth Land - [51319]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51318]	WA	In buffer area only
Commonwealth Land - [51415]	WA	In buffer area only
Commonwealth Land - [51418]	WA	In buffer area only
Commonwealth Land - [51898]	WA	In buffer area only
Commonwealth Land - [51216]	WA	In buffer area only
Commonwealth Land - [50816]	WA	In buffer area only
Commonwealth Land - [51261]	WA	In buffer area only
Commonwealth Land - [50763]	WA	In buffer area only
Commonwealth Land - [51260]	WA	In buffer area only
Commonwealth Land - [50761]	WA	In buffer area only
Commonwealth Land - [50760]	WA	In buffer area only
Commonwealth Land - [51265]	WA	In buffer area only
Commonwealth Land - [51264]	WA	In buffer area only
Commonwealth Land - [50766]	WA	In buffer area only
Commonwealth Land - [51267]	WA	In buffer area only
Commonwealth Land - [50765]	WA	In buffer area only
Commonwealth Land - [51266]	WA	In buffer area only
Commonwealth Land - [51268]	WA	In buffer area only
Commonwealth Land - [51269]	WA	In buffer area only
Commonwealth Land - [51301]	WA	In buffer area only
Commonwealth Land - [51300]	WA	In buffer area only
Commonwealth Land - [51308]	WA	In buffer area only
Commonwealth Land - [50770]	WA	In buffer area only
Commonwealth Land - [51243]	WA	In buffer area only
Commonwealth Land - [51309]	WA	In buffer area only
Commonwealth Land - [51244]	WA	In buffer area only
Commonwealth Land - [51249]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51246]	WA	In buffer area only
Commonwealth Land - [50837]	WA	In buffer area only
Commonwealth Land - [51245]	WA	In buffer area only
Commonwealth Land - [51241]	WA	In buffer area only
Commonwealth Land - [50738]	WA	In buffer area only
Commonwealth Land - [51247]	WA	In buffer area only
Commonwealth Land - [50833]	WA	In buffer area only
Commonwealth Land - [50733]	WA	In buffer area only
Commonwealth Land - [51242]	WA	In buffer area only
Commonwealth Land - [50735]	WA	In buffer area only
Commonwealth Land - [50732]	WA	In buffer area only
Commonwealth Land - [50730]	WA	In buffer area only
Commonwealth Land - [50783]	WA	In buffer area only
Commonwealth Land - [51262]	WA	In buffer area only
Commonwealth Land - [51263]	WA	In buffer area only
Commonwealth Land - [51149]	WA	In buffer area only
Commonwealth Land - [51148]	WA	In buffer area only
Commonwealth Land - [51248]	WA	In buffer area only
Commonwealth Land - [50709]	WA	In buffer area only
Commonwealth Land - [51200]	WA	In buffer area only
Commonwealth Land - [51202]	WA	In buffer area only
Commonwealth Land - [51201]	WA	In buffer area only
Commonwealth Land - [51972]	WA	In buffer area only
Commonwealth Land - [51306]	WA	In buffer area only
Commonwealth Land - [51288]	WA	In buffer area only
Commonwealth Land - [50771]	WA	In buffer area only
Commonwealth Land - [50710]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51305]	WA	In buffer area only
Commonwealth Land - [51302]	WA	In buffer area only
Commonwealth Land - [51307]	WA	In buffer area only
Commonwealth Land - [50718]	WA	In buffer area only
Commonwealth Land - [51304]	WA	In buffer area only
Commonwealth Land - [50768]	WA	In buffer area only
Commonwealth Land - [50769]	WA	In buffer area only
Commonwealth Land - [50819]	WA	In buffer area only
Commonwealth Land - [51303]	WA	In buffer area only
Commonwealth Land - [51289]	WA	In buffer area only
Commonwealth Land - [51971]	WA	In buffer area only
Commonwealth Land - [51280]	WA	In buffer area only
Commonwealth Land - [50767]	WA	In buffer area only
Commonwealth Land - [51203]	WA	In buffer area only
Commonwealth Land - [51204]	WA	In buffer area only
Commonwealth Land - [51205]	WA	In buffer area only
Commonwealth Land - [51206]	WA	In buffer area only
Commonwealth Land - [51228]	WA	In buffer area only
Commonwealth Land - [51229]	WA	In buffer area only
Commonwealth Land - [50824]	WA	In buffer area only
Commonwealth Land - [50791]	WA	In buffer area only
Commonwealth Land - [50826]	WA	In buffer area only
Commonwealth Land - [50797]	WA	In buffer area only
Commonwealth Land - [50827]	WA	In buffer area only
Commonwealth Land - [51341]	WA	In buffer area only
Commonwealth Land - [50707]	WA	In buffer area only
Commonwealth Land - [50820]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50821]	WA	In buffer area only
Commonwealth Land - [50822]	WA	In buffer area only
Commonwealth Land - [51351]	WA	In buffer area only
Commonwealth Land - [51350]	WA	In buffer area only
Commonwealth Land - [51353]	WA	In buffer area only
Commonwealth Land - [50690]	WA	In buffer area only
Commonwealth Land - [51355]	WA	In buffer area only
Commonwealth Land - [51354]	WA	In buffer area only
Commonwealth Land - [51357]	WA	In buffer area only
Commonwealth Land - [51424]	WA	In buffer area only
Commonwealth Land - [50808]	WA	In buffer area only
Commonwealth Land - [50828]	WA	In buffer area only
Commonwealth Land - [51221]	WA	In buffer area only
Commonwealth Land - [50829]	WA	In buffer area only
Commonwealth Land - [50798]	WA	In buffer area only
Commonwealth Land - [50799]	WA	In buffer area only
Commonwealth Land - [51226]	WA	In buffer area only
Commonwealth Land - [51510]	WA	In buffer area only
Commonwealth Land - [51224]	WA	In buffer area only
Commonwealth Land - [51227]	WA	In buffer area only
Commonwealth Land - [51222]	WA	In buffer area only
Commonwealth Land - [51225]	WA	In buffer area only
Commonwealth Land - [51220]	WA	In buffer area only
Commonwealth Land - [51223]	WA	In buffer area only
Commonwealth Land - [51908]	WA	In buffer area only
Commonwealth Land - [51235]	WA	In buffer area only
Commonwealth Land - [51234]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51232]	WA	In buffer area only
Commonwealth Land - [51236]	WA	In buffer area only
Commonwealth Land - [51237]	WA	In buffer area only
Commonwealth Land - [50836]	WA	In buffer area only
Commonwealth Land - [50835]	WA	In buffer area only
Commonwealth Land - [50834]	WA	In buffer area only
Commonwealth Land - [50839]	WA	In buffer area only
Commonwealth Land - [50838]	WA	In buffer area only
Commonwealth Land - [51358]	WA	In buffer area only
Commonwealth Land - [51124]	WA	In buffer area only
Commonwealth Land - [51903]	WA	In buffer area only
Commonwealth Land - [51157]	WA	In buffer area only
Commonwealth Land - [51150]	WA	In buffer area only
Commonwealth Land - [51152]	WA	In buffer area only
Commonwealth Land - [51151]	WA	In buffer area only
Commonwealth Land - [51158]	WA	In feature area
Commonwealth Land - [51153]	WA	In buffer area only
Commonwealth Land - [51231]	WA	In buffer area only
Commonwealth Land - [51159]	WA	In buffer area only
Commonwealth Land - [51233]	WA	In buffer area only
Commonwealth Land - [51230]	WA	In buffer area only
Commonwealth Land - [51904]	WA	In buffer area only
Commonwealth Land - [51906]	WA	In buffer area only
Commonwealth Land - [51909]	WA	In buffer area only
Commonwealth Land - [51901]	WA	In buffer area only
Commonwealth Land - [51902]	WA	In buffer area only
Commonwealth Land - [51907]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51900]	WA	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Army Magazine Buildings Irwin Barracks	WA	Listed place	In buffer area only
Inglewood Post Office	WA	Listed place	In buffer area only
Perth General Post Office	WA	Listed place	In buffer area only
South Perth Post Office	WA	Listed place	In buffer area only
Victoria Park Post Office	WA	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
[Charadrius ruficapillus](#) Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
[Diomedea amsterdamensis](#) Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Gallinago megala](#) Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
[Gallinago stenura](#) Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Himantopus himantopus](#) Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Limosa limosa](#) Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In buffer area only
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Numenius minutus](#) Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
[Numenius phaeopus](#) Whimbrel [849]		Roosting known to occur within area	In buffer area only
[Pachyptila turtur](#) Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Breeding known to occur within area	In feature area
[Phalaropus lobatus](#) Red-necked Phalarope [838]		Roosting known to occur within area	In buffer area only
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
[Pluvialis squatarola](#) Grey Plover [865]		Roosting known to occur within area overfly marine area	In buffer area only
[Recurvirostra novaehollandiae](#) Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In buffer area only
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Dotterel, Hooded Plover [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In buffer area only
Mammal			
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Reptile			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Alfred Cove	Nature Reserve	WA	In buffer area only
Canning River	Management Area	WA	In buffer area only
Dundas Road	Nature Reserve	WA	In buffer area only
Kenwick Wetlands	Nature Reserve	WA	In buffer area only
Kings Park	Botanic Gardens	WA	In buffer area only
Matilda Bay Reserve	5(1)(g) Reserve	WA	In buffer area only
Milyu	Nature Reserve	WA	In buffer area only
Perth Zoo	Other	WA	In buffer area only
Swan Estuary	Marine Park	WA	In buffer area only
Swan Estuary - Alfred Cove	Marine Park	WA	In buffer area only
Swan Estuary - Milyu	Marine Park	WA	In buffer area only
Swan Estuary - Pelican Point	Marine Park	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Swan River	Management Area	WA	In buffer area only
Unnamed WA36440	Management Area	WA	In buffer area only
Unnamed WA37997	Nature Reserve	WA	In buffer area only
Unnamed WA44414	5(1)(g) Reserve	WA	In buffer area only
Unnamed WA49299	Nature Reserve	WA	In buffer area only
Unnamed WA49362	Nature Reserve	WA	In buffer area only
Unnamed WA49363	Conservation Park	WA	In buffer area only
Unnamed WA50067	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA53313	Conservation Park	WA	In buffer area only

Nationally Important Wetlands

[Resource Information]

Wetland Name	State	Buffer Status
Booragoon Swamp	WA	In buffer area only
Brixton Street Swamps	WA	In buffer area only
Herdsman Lake	WA	In buffer area only
Palmer Barracks, Guildford	WA	In buffer area only
Perth Airport Woodland Swamps	WA	In buffer area only
Swan-Canning Estuary	WA	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Airport & Freight Access Gateway	2010/5384	Controlled Action	Post-Approval	In buffer area only
Construction of Fiona Stanley Hospital	2008/3970	Controlled Action	Post-Approval	In buffer area only
Garden Street road extension, Huntingdale, city of Gosnells, WA	2016/7735	Controlled Action	Post-Approval	In buffer area only
Jandakot Airport Expansion, Commercial Development and Clearing of Vegetation	2009/4796	Controlled Action	Post-Approval	In buffer area only
Native vegetation clearing of Lot 21 Webster Road for Industrial Development	2011/6186	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Natural Gas Pipeline Expansion	2006/2813	Controlled Action	Post-Approval	In buffer area only
Ranford Road Residential Development	2002/549	Controlled Action	Post-Approval	In buffer area only
Residential Development at Shenton Park	2007/3386	Controlled Action	Completed	In buffer area only
Residential Estate at Lot 1580 Warton Road, Southern River	2004/1471	Controlled Action	Post-Approval	In buffer area only
Roe Highway extension, Kwinana Freeway to Stock Road, WA	2009/5031	Controlled Action	Post-Approval	In buffer area only
Roe Hwy Extension	2003/972	Controlled Action	Post-Approval	In buffer area only
Shenton Park Subdivision	2004/1479	Controlled Action	Completed	In buffer area only
Southern Link Road Stage 3 City of Canning	2020/8809	Controlled Action	Referral Decision	In buffer area only
Thornlie-Cockburn Link Project, WA	2018/8188	Controlled Action	Post-Approval	In buffer area only
To grade separate three intersections on Tonkin Highway, WA	2014/7385	Controlled Action	Post-Approval	In buffer area only
Tonkin Highway Grade Separated Interchanges	2019/8529	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Burslem Drive Bridge Duplication Over Canning River, Maddington, WA	2014/7115	Not Controlled Action	Completed	In buffer area only
Commercial development of Lot 106 Wright Road, Forrestdale WA	2003/1255	Not Controlled Action	Completed	In buffer area only
Construction of international rowing course and commercial/residential areas	2003/1034	Not Controlled Action	Completed	In buffer area only
Construction of Pawsey High Performance Computing Centre	2010/5560	Not Controlled Action	Completed	In feature area
Construction of the Perth Stadium and associated infrastructure	2013/6740	Not Controlled Action	Completed	In buffer area only
Curtin Main Street Project - Transformation of Bentley Campus to a major urban centre WA	2013/7044	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Development of a Diagnostic Laboratory	2011/6089	Not Controlled Action	Completed	In buffer area only
Development of Crown Towers Five Star Quality Hotel	2012/6695	Not Controlled Action	Completed	In buffer area only
Development of Existing Lots 9970 & 10754, Bedbrook Pl, Shenton Park, WA	2013/7033	Not Controlled Action	Completed	In buffer area only
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027	Not Controlled Action	Completed	In buffer area only
extensions to minerals laboratory	2005/2285	Not Controlled Action	Completed	In buffer area only
Forrestfield Airport Link, WA	2015/7399	Not Controlled Action	Completed	In buffer area only
Fremantle Ports Inner Harbour Capital Dredging Proposal	2005/2477	Not Controlled Action	Completed	In buffer area only
GPO Building, 3 Forrest Place, Perth WA 6000	2017/8014	Not Controlled Action	Completed	In buffer area only
Hartfield Park Sporting Field Extension	2013/7008	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Industrial Development (multiple lots) Edward Street, Kenwick, WA	2018/8231	Not Controlled Action	Completed	In buffer area only
Kwinana Fwy southbound widening Roe Hwy to Armadale Rd and construction of farrington Rd off-ramp	2013/7062	Not Controlled Action	Completed	In buffer area only
Murdoch University Sports Precinct, Melville, WA	2016/7823	Not Controlled Action	Completed	In buffer area only
Office & Electronic Assembly Building, Lot 106 Watts Place, Bentley, WA	2012/6440	Not Controlled Action	Completed	In feature area
Roe Highway - Karel Avenue to Hope Road Bridge Project	2005/2061	Not Controlled Action	Completed	In buffer area only
Shenton Park Rehabilitation Hospital Redevelopment, Shenton Park, WA	2015/7622	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Shenton Park Zone Substation Conversion and Expansion	2012/6354	Not Controlled Action	Completed	In buffer area only
South Metropolitan Crop Research Hub, Murdoch WA	2018/8201	Not Controlled Action	Completed	In buffer area only
Tonkin Highway Upgrade, Guildford Road to Great Eastern Highway, WA	2019/8545	Not Controlled Action	Completed	In buffer area only
Translocation of orchids (Caladenia huegelii) from Roe Hway Reserve	2002/781	Not Controlled Action	Completed	In buffer area only
Yule Brook Main Drain Flood Mitigation Works	2019/8572	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
City of Cockburn Sporting Facilties	2005/2139	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Commercial Estate and Aeronautical Infrastructure Development, Precincts 2A & 2B	2006/3021	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Perth GPO alteration and refurbishment	2007/3318	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Sale of ABC Sound Broadcasting and Television Studios	2008/3951	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
South West Metropolitan Railway Project	2003/1175	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
State Football Centre	2020/8824	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Commercial development of Lot 414 Grove Road, Kenwick	2021/9022	Referral Decision	Referral Publication	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Referral decision				
GPO Building, 3 Forrest Place, Perth WA 6000	2017/7988	Referral Decision	Completed	In buffer area only
Rezoning of Crown Reserve 39181 to facilitate future residential development	2005/2096	Referral Decision	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix B

Conservation Significant Flora Species and likelihood of Occurrence Assessment

emerge ASSOCIATES

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025		
Caladenia huegelii	CR	EN	PG	Well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels.	Sep-early Nov	Unlikely
Calytrix breviseta subsp. *breviseta*	CR	EN	P	Seasonally wet sandy-clay soil on swampy flats	Oct-Nov	Unlikely
Drakaea elastica	CR	EN	PG	Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps. Typically in banksia woodland or thickets of Kunzea glabrescens.	late Sep-Oct/Nov, survey Jul-Aug	Unlikely
Grevillea thelemanniana	CR	CR	P	Sand, sandy clay. Winter-wet low-lying flats.	May-Nov	Unlikely
Ptilotus pyramidatus	CR	CR	P	Seasonally inundated, flat floodplain on pale grey muddy sand.	Early Oct	Unlikely
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	P	Low woodland on grey, clayey sand with lateritic pebbles (Pinjarra Plain) near winter wet flats.	Sep-Nov	Unlikely
Austrostipa jacobsiana	CR	-	P	Grey sandy clay.	Nov-Jan	Unlikely
Thelymitra dedmaniarum	CR	EN	PG	Red brown sandy loam with dolerite and granite outcrops.	Oct-Nov	Unlikely
Eucalyptus x balanites	CR	EN	P	Light coloured sandy soils over laterite. Habitat consists of gently sloping heathlands; open mallee woodland over shrubland (Population 2) or heathland with emergent mallees (population 1)	Oct - Feb	Unlikely
Austrostipa bronwenae	EN	-	P	Grey-brown sandy loam soil in low lying winter wet areas.	Sep-Nov	Unlikely
Diuris purdiei	EN	EN	PG	Sand to sandy clay soils in areas subject to winter inundation.	late September to mid-October, but only after a summer or early autumn fire	Unlikely
Drakaea micrantha	EN	VU	PG	Open sandy patches often adjacent to winter-wet swamps.	Sept- early Oct	Unlikely

	WA	EPBC Act				
Eremophila glabra subsp. *chlorella*	EN	-	P	Sandy clay. Winter-wet depressions.	Jul-Nov	Unlikely
Lepidosperma rostratum	EN	EN	P	Peaty sand and clay amongst low heath, in winter-wet swamps.	May-Jun (survey late Jun-Aug)	Unlikely
Macarthuria keigheryi	EN	EN	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec or Feb-Mar	Unlikely
Austrostipa bronwenae	EN	-	P	Grey-brown sandy loam soil in low lying winter wet areas.	Sep-Nov	Unlikely
Goodenia arthrotricha	EN	EN	P	Granite rocks, slopes	Oct-Nov	Unlikely
Grevillea curviloba subsp. *incurva*	EN	EN	P	Sand, sandy loam. Winter-wet heath.	Aug-Sep	Unlikely
Diplolaena andrewsii	EN	EN	P	Granite outcrops & hillsides.	Jul-Oct	Unlikely
Thelymitra stellata	EN	EN	PG	Sandy loam, clay or gravel over laterite or gravel.	Sep-Nov	Unlikely
Synaphea sp. Pinjarra Plain (A.S. George 17182)	EN	CR	P	White grey clayey sand on edges of seasonally inundated low lying areas.	Sep-Oct	Unlikely
Andersonia gracilis	VU	EN	P	Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep-Nov	Unlikely
Banksia mimica	VU	EN	P	Flat to gentle slopes in grey and white sand in open woodlands.	Dec-Jan	Unlikely
Conospermum undulatum	VU	VU	P	Sand and sandy clay soils, on flat or gently sloping sites between the Swan and Canning Rivers	May-Oct	Unlikely
Eleocharis keigheryi	VU	VU	P	Clay or sandy loam in freshwater creeks and transient waterbodies such as seasonally wet clay pans.	Aug-Dec	Unlikely
Acacia denticulosa	VU	VU	P	Sand, loam, clay. Granite outcrops, rarely on sandplains.	Sep-Oct	Unlikely
Diuris drummondii	VU	VU	PG	In low-lying depressions in peaty and sandy clay swamps.	Nov-Jan	Unlikely
Eucalyptus rhodantha var. *rhodantha*	VU	VU	P	Grey/yellow/red sand over laterite. Undulating country, hillslopes.	Jul-Sep or Dec-Jan	Unlikely
Morelotia australiensis	VU	VU	P	Sand over clay, winter wet depressions and drainage lines.	Nov-Dec	Unlikely
Chamelaucium lullfitzii	VU	EN	P	White yellow sand in low woodland.	Oct-Nov	Unlikely
Acacia anomala	VU	VU	P	Shallow sand,loam,clay or gravel	Aug-Sep	Unlikely

	WA	EPBC Act				
Diuris micrantha	VU	VU	PG	Dark grey-black sandy clay-loam in winter wet depressions or swamps. Often in shallow standing water.	Aug/Sep-early Oct	Unlikely
Anigozanthos viridis subsp. *terraspectans*	VU	VU	P	Grey sand, clay loam. Winter-wet depressions.	Aug-Sep	Unlikely
Picris compacta	EX	-	A/P	Loam, limestone. River banks.	Unknown	Unlikely
Eucalyptus x mundijongensis	P1	-	P	Loam or grey sand. Paddocks.	Unknown	Unlikely
Typhonium peltandroides	P1	-	P	Shallow sand amongst rough sandstone, red clay. Sides of gorges, vine thickets, rocky sites or along watercourses.	Dec or Jan-Feb	Unlikely
Bolboschoenus fluviatilis	P1	-	P	Floodplain with grey/brown wet sand.	Nov	Unlikely
Calandrinia uncinella	P1	-	A	seasonally wet swamps or on saline river flats on ground or embankments just above water, growing in soils described as grey-brown sandy or silty loams or white to creamy sands over clays usually with poor drainage.	Aug-Oct	Unlikely
Haloragis scoparia	P1	-	P	Clay in winter-wet areas.	May	Unlikely
Hydrocotyle striata	P1	-	A	Sand and clay in springs and creeklines.	Nov	Unlikely
Levenhookia preissii	P1	-	A	Grey or black, peaty sand. Swamps	Sep-Dec/Jan	Unlikely
Ptilotus sericostachyus subsp. *roseus*	P1	-	P	Unknown. Seem to be associated with wetlands/rivers.	Sep-Dec	Unlikely
Schoenus sp. Beaufort (G.J. Keighery 6291)	P1	-	A	Mud in winter-wet clay pans.	Sep-Oct	Unlikely
Comesperma rhadinocarpum	P2	-	P	Sandy soils.	Oct-Nov	Unlikely
Johnsonia pubescens subsp. *cygnorum*	P2	-	P	Grey white yellow sands on flats and seasonally wet areas.	Sep	Unlikely
Acacia benthamii	P2	-	P	Sand, typically on limestone breakaways	Aug-Sept	Unlikely
Calectasia grandiflora	P2	-	P	White, grey or yellow sand.	Jun-Nov	Unlikely
Calothamnus macrocarpus	P2	-	P	Rocky quartzite soils, sand. Slopes.	Feb or Aug-Dec	Unlikely
Chamelaucium floriferum subsp. *diffusum*	P2	-	P	Sand, clay. Frequently with outcropping granite.	Jan-Dec	Unlikely
Comesperma griffinii	P2	-	A/P	Yellow or grey sand on plains.	Oct	Unlikely
Diuris brevis	P2	-	P	Black peaty soil.	Unknown	Unlikely
Eucalyptus educta	P2	-	P	Shallow soils. Granite rocks.	Apr	Unlikely

	WA	EPBC Act				
Lepyrodia curvescens	P2	-	P	Sand, laterite. Seasonally inundated swampland.	Sep-Nov	Unlikely
Melaleuca viminalis	P2	-	P	Sand, clay in creeklines and wetlands.	Oct-Dec	Unlikely
Poranthera moorokatta	P2	-	A	Sandy or clay soils. Dampland or low sandy dunes in banksia woodland.	Sep-early Nov	Unlikely
Schoenus loliaceus	P2	-	A	Sandy soils in winter-wet depressions.	Aug-Nov	Unlikely
Thelymitra variegata	P2	-	P	Sandy clay, sand, laterite.	Jun-Sep	Unlikely
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	P2	-	P	Grey sand with lateritic gravel.	Dec	Unlikely
Grevillea manglesii subsp. *ornithopoda*	P2	-	P	Red-brown loam over clay	Sep-Nov	Unlikely
Angianthus micropodioides	P3	-	A	Saline sandy soils on edge of rivers, depressions and clay pans.	Nov-Dec or Jan-Feb	Unlikely
Babingtonia urbana	P3	-	P	Grey sand, lateritic gravel.	Jan-Mar	Unlikely
Byblis gigantea	P3	-	P	Sandy-peat swamps. Seasonally wet areas.	Sep-Jan	Unlikely
Carex tereticaulis	P3	-	P	Black peaty sand.	Sep-Oct	Unlikely
Eryngium sp. Subdecumbens (G.J. Keighery 5390)	P3	-	A	Clay in seasonal wetlands.	Sep-Nov	Unlikely
Lasiopetalum membranaceum	P3	-	P	Sand over limestone	Sep-Dec	Unlikely
Schoenus benthamii	P3	-	P	White, grey sand, sandy clay in winter wet flats and swamps.	Oct-Nov	Unlikely
Schoenus capillifolius	P3	-	A	Brown mud in claypans.	Oct-Nov	Unlikely
Schoenus pennisetis	P3	-	A	Grey or peaty sand in swamps and winter-wet depressions.	Aug-Sep	Unlikely
Acacia horridula	P3	-	P	Gravelly soils over granite, sand, rocky hillsides.	May-Aug	Unlikely
Adenanthos cygnorum subsp. *chamaephyton*	P3	-	P	Grey sand, lateritic gravel.	Jul or Sep to Dec or Jan	Unlikely
Banksia pteridifolia subsp. *vernalis*	P3	-	P	White/grey sand over laterite.	Sep-Oct	Unlikely
Chamaescilla gibsonii	P3	-	P	Clay to sandy clay in winter-wet flats, shallow water-filled claypans.	Sep	Unlikely
Conostylis bracteata	P3	-	P	Sand, limestone. Consolidated sand dunes	Aug-Sep	Unlikely
Cyathochaeta teretifolia	P3	-	P	Grey sand, sandy clay in swamps and creek edges.	Oct-Jan	Unlikely
Dampiera triloba	P3	-	P	Damp peat/loam soil.	Aug-Dec	Unlikely

	WA	EPBC Act				
Dicrastylis micrantha	P3	-	P	Red sand. Sandplains.	Sep-Dec	Unlikely
Dillwynia dillwynioides	P3	-	P	Winter wet depressions on sandy soils	Aug - Dec	Unlikely
Eryngium pinnatifidum subsp. palustre (G.J. Keighery 13459)	P3	-	P	Grey brown sand or clay in winter wet flats.	Sep-Nov	Unlikely
Hibbertia leptotheca	P3	-	P	Brown to white sand with limestone.	Aug-Oct	Unlikely
Isopogon autumnalis	P3	-	P	Yellow-grey sand.	Feb,Mar,Apr,May or June	Unlikely
Isotropis cuneifolia subsp. *glabra*	P3	-	P	Sand, clay loam in winter-wet flats.	Sep	Unlikely
Lasiopetalum glutinosum subsp. *glutinosum*	P3	-	P	Brown clay loam on slopes	Sep-Dec	Unlikely
Myriophyllum echinatum	P3	-	A	Clay in winter-wet flats.	Nov	Unlikely
Platysace ramosissima	P3	-	P	Sandy soils.	Oct-Nov	Unlikely
Schoenus sp. Waroona (G.J. Keighery 12235)	P3	-	A	Clay or sandy clay. Winter-wet flats.	Oct-Nov	Unlikely
Stylidium aceratum	P3	-	A	Sandy soils in swamp heathland.	Oct-Nov	Unlikely
Stylidium paludicola	P3	-	P	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland	Oct-Dec	Unlikely
Styphelia filifolia	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Unlikely
Thysanotus anceps	P3	-	P	White or grey sand, lateritic gravel, laterite.	Oct-Dec	Unlikely
Aponogeton hexatepalus	P4	-	P	Mud. Freshwater: ponds, rivers, claypans.	Jul-Oct	Unlikely
Dodonaea hackettiana	P4	-	P	Sand, outcropping limestone.	Jul-Oct	Unlikely
Drosera occidentalis	P4	-	P	Flat, brown/white/yellow moist sand/clay/peat, often near swamps.	Oct-Dec/Jan	Unlikely
Hydrocotyle lemnoides	P4	-	A	Floating in swamps.	Unknown	Unlikely
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain	Dec-Feb	Unlikely
Ornduffia submersa	P4	-	A	Sandy clay in inundated wetland/creek.	Aug-Nov	Unlikely
Stylidium longitubum	P4	-	A	Sandy clay, clay. Seasonal wetlands.	Oct-Dec	Unlikely
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4	-	P	Winter-wet areas on grey sand.	Oct-Feb	Unlikely
Verticordia lindleyi subsp. *L=lindleyi*	P4	-	P	Sand and sandy clay in winter wet areas.	May or Nov-Jan	Unlikely

	WA	EPBC Act				
Calothamnus graniticus subsp. *leptophyllus*	P4	-	P	Clay over granite, lateritic soils. Hillsides.	Jun-Aug	Unlikely
Cyanothamnus tenuis	P4	-	P	Laterite, stony soils, granite.	Aug-Nov	Unlikely
Eucalyptus caesia subsp. *caesia*	P4	-	P	Loam. Granite outcrops.	May-Sep	Unlikely
Eucalyptus caesia subsp. *magna*	P4	-	P	Loam. Granite outcrops.	May-Sep	Unlikely
Eucalyptus kruseana	P4	-	P	Sandy loam. Granite outcrops & hills.	Jun-Sep	Unlikely
Grevillea pimeleoides	P4	-	P	Gravelly soils over granite. Rocky hillsides.	May-Nov	Unlikely
Hypolaena robusta	P4	-	P	White sand. Sandplains	Sep-Oct	Unlikely
Lasiopetalum bracteatum	P4	-	P	Sandy clay, clay, lateritic gravel along drainage lines, creeks, gullies, granite outcrops.	Aug-Nov	Unlikely
Schoenus natans	P4	-	A	Aquatic, in winter-wet depressions.	Oct	Unlikely

Note: T=threatened, CE=critically endangered, E=endangered, V=vulnerable, EX= presumed extinct, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4, P=perennial, PG=perennial geophyte, A=annual. Species considered to potentially occur within the site are shaded green

Appendix C

Flora Species List

Family	Status	Species
Bignoniaceae		
	*Pl	*Jacaranda mimosifolia*
Casuarinaceae		
	*Pl	*Casuarina cunninghamiana*
	*Pl	*Casuarina sp.*
Cyperaceae		
	*	*Cyperus ?tenuiflorus*
Fabaceae		
	*Pl	*Gleditsia sp.*
		Gompholobium tomentosum
	Pl	*Hardenbergia comptoniana*
	Pl	*Jacksonia furcellata*
Juncaceae		
		Juncus pallidus
Malvaceae		
	*Pl	*Brachychiton acerifolius*
Myrtaceae		
	*Pl	*Agonis flexuosa*
	*Pl	*Callistemon sp.*
	Pl	*Corymbia calophylla*
	*Pl	*Corymbia ficifolia*
	*Pl	*Corymbia maculata*
	*Pl	*Eucalyptus caesia*
	*Pl	*Eucalyptus camaldulensis*
	*Pl	*Eucalyptus erythrocorys*
	*Pl	*Eucalyptus grandis*
	*Pl	*Eucalyptus lehmannii*
	*Pl	*Eucalyptus leucoxylon*
	*Pl	*Eucalyptus longicornis*
	Pl	*Eucalyptus rudis*
	*Pl	*Eucalyptus sideroxylon*
	*Pl	*Eucalyptus utilis*
	*Pl	*Eucalyptus sp.*
	Pl	*Melaleuca preissiana*
	*Pl	*Melaleuca quinquenervia*
Pinaceae		
	*Pl	*Pinus pinaster*
	*Pl	*Pinus radiata*
Poaceae		
	*	*Cenchrus clandestinus*
Proteaceae		
	Pl	*Banksia attenuata*
	Pl	*Banksia grandis*
	Pl	*Banksia littoralis*
Typhaceae		
		Typha orientalis

*=non-native, Pl=planted

Appendix D

Conservation Significant Communities and Likelihood of Occurrence Assessment

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Code	Community name	TEC/ PEC	Level of significance		Likelihood of occurrence
			State	EPBC Act	
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994))	TEC	CR	EN	Unlikely
SCP10a	Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. (1994))	TEC	EN	CR	Unlikely
Muchea limestone	Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	TEC	EN	EN	Unlikely
SCP20a	*Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))	TEC	EN	EN	Unlikely
SCP02	Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson et al. (1994))	TEC	EN	-	Unlikely
SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. (1994))	TEC	VU	CR	Unlikely
SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	TEC	VU	CR	Unlikely
Tuart woodlands	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	TEC/ PEC	P3	CR	Unlikely
Banksia WL SCP	Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	TEC/ PEC	P3	EN	Unlikely
SCP21c	Low lying *Banksia attenuata* woodlands or shrublands	TEC/ PEC	P3	EN	Unlikely
Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh	TEC/ PEC	P3	VU	Unlikely
Wooded waterbird wetlands	Wooded wetlands which support colonial waterbird nesting areas	PEC	P2		Unlikely
SCP22	*Banksia ilicifolia* woodlands	PEC	P3	-	Unlikely

Note: TEC=threatened ecological community, PEC=priority ecological community, CR=critically endangered, EN=endangered, VU=vulnerable, P2=priority 2, P3=priority 3

Appendix E

Conservation Significant Fauna and Likelihood of Occurrence Assessment

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Birds					
Actitis hypoleucos	Common sandpiper	MI	MI	Edge of sheltered waters salt or fresh, e.g. estuaries, mangrove creeks, rocky coasts, near-coastal saltlakes (including saltwork ponds), river pools, lagoons, claypans, drying swamps, flood waters, dams and sewage ponds. Preferring situations where low perches are available (Johnstone & Storr 1998).	**Unlikely** No suitable habitat within site.
Anous stolidus	Common noddy	MI	MI	Tropical and subtropical seas, cayes, reefs, buoys and piles (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Apus pacificus	Fork-tailed swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Pizzey & Knight 2012).	**Possible** May opportunistically occur in or or fly over the site on commute or while searching for prey.
Arenaria interpres	Ruddy turnstone	MI	MI	Tidal mud and reef flats, sheltered rocky coasts, stony and seaweedy beaches and sandpits, dry coral ridges (Abrolhos) and pebbly shores of near-coastal saltlakes (including saltwork ponds) (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Botaurus poiciloptilus	Australasian bittern	EN	EN	In or over water, in tall reedbeds, sedges, rushes, cumbungi, lignum. Also occurs in ricefields, drains in tussocky paddocks and occasionally in saltmarshes and brackish wetlands.	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Cacatua pastinator pastinator	Muir's corella	CD	-	Wheat and sheep farming country with remnant native forest. Species is restricted to the south-west corner of WA, near Lake Muir (DPaW 2015).	**Unlikely** No suitable habitat within site and outside current known distribution.
Calidris acuminata	Sharp-tailed sandpiper	MI	MI	Occurs in tidal mudflats, saltmarshes and mangroves, as well as, shallow fresh, brackish or saline inland wetlands. It is also known from floodwaters, irrigated pastures and crops, sewage ponds, saltfields.	**Unlikely** No suitable habitat within site.
Calidris alba	Sanderling	MI	MI	Mainly steeply shelving sandy beaches exposed to ocean swell. Also sandy inlets, estuarine sandbanks and near-coastal saltlakes (including saltwork ponds) (Johnstone & Storr 1998).	**Unlikely** No suitable habitat within site.
Calidris canutus	Red knot	EN	EN (MI)	Mud and sand flats in estuaries and on sheltered coasts. Also near-coastal saltlakes, including saltwork ponds.	**Unlikely** No suitable habitat within site.
Calidris ferruginea	Curlew sandpiper	CR	CR (MI)	Mainly shallows of estuaries and near-coastal saltlakes (including saltwork ponds) and drying near-coastal freshwater lakes and swamps. Also beaches and near-coastal sewage ponds.	**Unlikely** No suitable habitat within site.
Calidris melanotos	Pectoral sandpiper	MI	MI	Mainly fresh waters (swamps, lagoons, river pools, irrigation channels and sewage ponds); also samphire flats around estuaries and saltlakes (Johnstone & Storr 1998).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Calidris ruficollis	Red-necked stint	MI	MI	Tidal mudflats, saltmarshes, sandy or shelly beaches, saline and freshwater wetlands (coastal and inland), saltfields, sewage ponds (Pizzey and Knight 2012).	**Unlikely** No suitable habitat within site.
Calidris subminuta	Long-toed stint	MI	MI	Mainly freshwater swamps (especially when drying and where vegetation is short), river pools, lagoons and claypans; also brackish pools, sewage ponds and samphire flats around estuaries and saltlakes.	**Unlikely** No suitable habitat within site.
Calidris tenuirostris	Great knot	CR	CR (MI)	Mud or sand flats in estuaries and on sheltered coasts. Also near-coastal saltlakes, including saltwork ponds.	**Unlikely** No suitable habitat within site.
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	VU	Eucalypt and Corymbia forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding Corymbia calophylla, Eucalyptus marginata, introduced Melia azedarach and Eucalyptus spp. trees.	**Likely** Suitable foraging habitat within site and recent records in the local area.
Charadrius bicinctus	Double-banded plover	MI	MI	Wide beaches, tidal mudflats, saltmarsh, wide and sparsely vegetated margins of shallow saline and freshwater wetlands, paddocks with sparse vegetation, ploughed fields, airfields.	**Unlikely** No suitable habitat within site.
Charadrius dubius	Little ringed plover	MI	MI	Open, muddy or sandy shores of lakes, swamps, tidal areas, sewage ponds or farm dams. Rare but regular summer migrant to Australia (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Charadrius leschenaultii	Great sand plover	VU	VU (MI)	Wide sandy or shelly beaches, sandpits, tidal mudflats, reefs, sand cays, mangroves, saltmarsh, dune wilderness, bare paddocks, seldom far inland (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Charadrius mongolus	Lesser sand plover	EN	EN (MI)	Sandy beaches and tidal estuarine flats. Also near-coastal saltlakes, including saltwork ponds (Johnstone & Storr 1998).	**Unlikely** No suitable habitat within site.
Dasyornis longirostris	Western bristlebird	EN	EN	Dense, low, closed coastal heaths. Open heaths with dense clumps of shrubs, eucalypt thickets and tall swampy heaths. Much reduced by fire, draining for agriculture, but may need fire for optimal status over 50-10+ years. Current range in WA confined to south coast from Albany to Hopetoun (Pizzey and Knight 2012).	**Unlikely** No suitable habitat within site and outside current known distribution.
Diomedea amsterdamensis	Amsterdam Island albatross	CR	EN (MI)	The Amsterdam albatross is a marine, pelagic seabird. It nests in open patchy vegetation (among tussocks, ferns or shrubs) near exposed ridges or hillocks (Weimerskirch et al. 1985). It sleeps and rests on ocean waters when not breeding (Marchant and Higgins 1990)	**Unlikely** No suitable habitat within site.
Diomedea epomophora	Southern royal albatross	VU	VU (MI)	Rare visitor to Western Australian seas; it breeds on subantarctic islands south of New Zealand (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Diomedea exulans	Wandering albatross	VU	VU (MI)	Marine, pelagic and aerial species. It breeds on Macquarie Island and feeds in Australian portions of the Southern Ocean (DoE 2018).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Diomedea sanfordi	Northern royal albatross	EN	EN	Species is marine, pelagic and aerial. Habitat includes subantarctic, subtropical, and occasionally Antarctic waters (Marchant & Higgins 1990). Rare visitors to south-western Australian waters.	**Unlikely** No suitable habitat within site.
Elanus scriptus	Letter-winged kite	P4	-	Open to sparsely wooded country and grassland near tree-lined streams or watercourses (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Falco hypoleucos	Grey falcon	VU	-	Species occurs in arid and semi-arid Australia, where it inhabits timbered lowland plains. In particular Acacia shrublands and that are crossed by tree-lined water courses. Species has also been observed hunting in treeless areas and frequenting tussock grassland and open woodlands (TSSC 2020).	**Unlikely** No suitable habitat within site.
Falco peregrinus	Peregrine falcon	OS	-	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	**Possible** May opportunistically occur in or or fly over the site on commute or while searching for prey.
Gallinago megala	Swinhoe's snipe	MI	MI	Wet, grassy ground; edges of reedy swamps (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Gallinago stenura	Pin-tailed snipe	MI	MI	Boggy edges of vegetated wetlands; sewage and other ponds; stubbles, grasslands with shrubs, pastures (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Glareola maldivarum	Oriental pratincole	MI	MI	Plains, shallow wet and dry edges of open bare wetlands, tidal mudflats and beaches (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Hydroprogne caspia	Caspian tern	MI	MI	Mainly sheltered areas, estuaries (when not laden with silt) and tidal creeks; occasionally near-coastal saltlakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh waters.	**Unlikely** No suitable habitat within site.
Ixobrychus dubius	Australian little bittern	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of Typha spp., Baumea spp. and tall rushes in freshwater swamps around lakes and along rivers (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Leipoa ocellata	Malleefowl	VU	VU	Scrubs and thickets of Eucalyptus spp., Melaleuca lanceolata and Acacia linophylla; also other dense litter-forming shrublands. Attracted to fallen wheat in stubbles and along roads (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Limosa lapponica	Bar-tailed godwit	r CR at s	MI	Estuarine sand and mudflats and sandy beaches with loads of seaweed; also reef flats and near-coastal saltlakes (including saltwork ponds) (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Limosa lapponica menzbieri	Bar-tailed godwit	CR	CR	Mainly coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats (Higgins and Davies 1996).	**Unlikely** No suitable habitat within site.
Limosa limosa	Black-tailed godwit	MI	MI	Tidal mudflats, estuaries, sewage ponds, shallow river margins, brackish or saline inland lakes, flooded pastures, airfields (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Macronectes giganteus	Southern giant-petrel	MI	EN (MI)	Breeds on southern subantarctic and antarctic islands. May visit Western Australian waters from February to December (mostly June to September) (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Macronectes halli	Northern giant petrel	MI	VU (MI)	Breeds on subantarctic islands. May visit Western Australian water from February to September (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Motacilla cinerea	Grey wagtail	MI	MI	In Australia mostly near running water in disused quarries, sandy and rocky streams in escarpments and rainforests, sewage ponds, ploughed fields and airfields (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Numenius madagascariensis	Eastern curlew	CR	CR (MI)	Mainly tidal mudflats; also reef flats, sandy beaches and rarely near-coastal lakes (including saltwork ponds) (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Numenius minutus	Little curlew	MI	MI	Dry grasslands, floodplains, margins of drying swamps; tidal mudflats, airfields, playing fields, crops, commercial saltfields, sewage ponds (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Numenius phaeopus	Whimbrel	MI	MI	Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, bare grasslands, sportsgrounds and lawns.	**Unlikely** No suitable habitat within site.
Oxyura australis	Blue-billed duck	P4	-	Mainly deeper freshwater swamps and lakes; occasionally saltlakes and estuaries freshened by flood waters (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Pachyptila turtur subantarctica	Fairy prion	-	VU	Breeds on subantarctic islands and is presumed to frequent subtropical waters during non-breeding period (TSSC 2015).	**Unlikely** No suitable habitat within site.
Pandion haliaetus	Osprey	MI	MI	Coasts, estuaries, bays, inlets, islands, and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Phaethon rubricauda	Red-tailed tropicbird	P4 (MI)	MI	Spend most of their lives at sea and rarely venture near land. This bird is normally found in tropical and subtropical seas around northern Australia. Though rarely seen in colder areas, a few pairs breed on Sugarloaf Rock, south of Cape Naturaliste (DPAW 2017b).	**Unlikely** No suitable habitat within site.
Phalaropus lobatus	Red-necked phalarope	MI	MI	Shallow pools in commercial saltfields, tidal mudflats, beaches, saltmarshes, freshwater wetlands.	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Philomachus pugnax	Ruff	MI	MI	Fresh, brackish and saline wetlands; tidal mudflats, saltfields, sewage ponds (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Phoebetria fusca	Sooty albatross	EN	VU (MI)	Marine, pelagic species that tolerates a wide range of sea surface temperatures and salinities. breeds on subtropical and subantarctic islands in the Indian and Atlantic Oceans, on vegetated cliffs and steep slopes that are sheltered from prevailing winds, often amongst tussock grass.	**Unlikely** No suitable habitat within site.
Plegadis falcinellus	Glossy Ibis	MI	MI	Well-vegetated wetlands, wet pasture, ricefields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats and occasionally dry grassland (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Pluvialis fulva	Pacific golden plover	MI	MI	Estuaries, mudflats, saltmarshes, mangroves; rocky reefs and stranded seaweed on ocean shores; margins of shallow open inland swamps; sewage ponds, short-grass paddocks, sportsgrounds, airfields, ploughed land (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Pluvialis squatarola	Grey Plover	MI	MI	Mudflats, saltmarsh, tidal reefs and estuaries, rarely inland (Pizzey and Knight 2012).	**Unlikely** No suitable habitat within site.
Rostratula australis	Australian painted snipe	EN	EN	Mainly shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (Marchant and Higgins 1993).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Sternula nereis nereis	Australian fairy tern	VU	VU	Sheltered blue-water seas close to land, estuaries (when free of silt) and near-coastal lakes (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Thalassarche cauta	Shy albatross	VU	VU (MI)	Scarce visitor (late May to mid-October) to southwestern and western seas. Breeds on islands off Tasmania and south New Zealand (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Thalassarche impavida	Campbell albatross	VU	VU (MI)	Scarce visitor to south-western and western Australian seas. Breeds on Campbell Island.	**Unlikely** No suitable habitat within site.
Thalassarche melanophris	Black-browed albatross	EN	VU (MI)	Seas of south and west coasts. Visitor to Western Australian mainland from January to early November (mostly May to September). Breeds on southern subantarctic and antarctic islands (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Thalassarche steadi	White-capped albatross	VU	VU (MI)	Scarce visitor (late May to mid-October) to southwestern and western seas. Breeds on islands off Tasmania and south New Zealand (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Thalasseus bergii	Crested tern	MI	MI	Mainly blue-water seas (especially within 3 km of land), including southern estuaries in summer and autumn (when free of silt); also tidal creeks in north, but not penetrating far into larger estuaries.	**Unlikely** No suitable habitat within site.
Thinornis cucullatus	Hooded plover	P4	VU	Margins and shallows of saltlakes, sandy and seaweedy beaches and estuaries; also dams (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Tringa brevipes	Grey-tailed tattler	P4 (MI)	MI	Tidal mud and reef flats, sheltered rocky coasts, stony and seaweedy beaches and sandpits, dry coral ridges (Abrolhos) and pebbly shores of near-coastal saltlakes (including saltwork ponds) (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site.
Tringa glareola	Wood sandpiper	MI	MI	Mainly shallow fresh waters (lagoons, swamps, claypans, river pools, dams, bore overflows and sewage ponds); occasionally brackish swamps, rarely saltlakes and estuaries (Pizzey & Knight).	**Unlikely** No suitable habitat within site.
Tringa nebularia	Common greenshank	MI	MI	Mudflats, estuaries, saltmarshes, margins of lakes, wetlands, claypans (fresh and saline), commercial saltfields, sewage ponds (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Tringa stagnatilis	Marsh sandpiper	MI	MI	Mainly shallow fresh or brackish waters: swamps, lakes, river pools, soaks, sewage ponds and bore overflows. Occasionally estuaries and salt ponds, and rarely coasts.	**Unlikely** No suitable habitat within site.
Tringa totanus	Common redshank	MI	MI	Sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand). Also found around saltlakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms (Higgins & Davies 1996).	**Unlikely** No suitable habitat within site.
Tyto novaehollandiae novaehollo	Australian masked owl	P3	-	Forests, open woodlands, farmlands with large trees. E.g. river red gums, adjacent cleared country, timbered watercourses, paperbark woodlands and caves (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Xenus cinereus	Terek sandpiper	MI	MI	Tidal mudflats, estuaries; shores and reefs of islands; coastal swamps, commercial saltfields (Pizzey & Knight 2012).	**Unlikely** No suitable habitat within site.
Zanda baudinii	Baudin's black cockatoo	EN	EN	Mainly eucalypt forests. Attracted to seeding Corymbia calophylla, Banksia spp., Hakea spp., and to fruiting apples and pears (Johnstone and Storr 1998).	**Unlikely** No suitable habitat within site and outside of modelled distribution.
Zanda latirostris	Carnaby's black cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of Pinus spp. Attracted to seeding Banksia spp., Hakea spp., Eucalyptus spp., Corymbia calophylla, Grevillea spp., and Allocasuarina spp. (Johnstone and Storr 1998).	**Recorded** Species observed during field survey.
Invertebrates					
Australotomurus morbidus	Cemetery springtail	P3	-	Unknown.	**Unlikely** No suitable habitat within site.
Euoplos inornatus	Inornate trapdoor spider	P3	-	Has previously been recorded in jarrah forest, including near clay banks and granite outcrop. Most records are from the Darling scarp/Jarrah Forest Region, with limited records from the Swan Coastal Plain (DBCA 2020).	**Unlikely** No suitable habitat within site.
Glossurocolletes bilobatus	a short-tongued bee	P2	-	Life history and habits are poorly documented/ unknown. It has been recorded only on plants of the Pailionaceae family (PaDIL 2022).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Hesperocolletes douglasi	Douglas's broad-headed bee	CR	CR	Banksia woodland vegetation (Pille Arnold 2019).	**Unlikely** No suitable habitat within site.
Idiosoma sigillatum	Swan Coastal Plain shield-backed	P3	-	Widely distributed in sandy areas on the Swan Coastal Plain and on Rottnest Island (Prince 2003).	**Unlikely** No suitable habitat within site.
Leioproctus contrarius	a short-tongued bee	P3	-	Life history and habits are poorly documented/ unknown. It has been recorded only on flowers of Goodeniaceae and possibly Lechenaultia stenosepala (Bamford 2003).	**Unlikely** No suitable habitat within site.
Leioproctus douglasiellus	a short-tongued bee	EN	CR	Life history and habits are poorly documented/ unknown. It has been recorded only on the flowers of Goodenia filiformis and Anthotium junciforme (Houston 2000).	**Unlikely** No suitable habitat within site.
Neopasiphae simplicior	a short-tongued bee	EN	CR	This species of native bee has been collected on flowers of Goodenia filiformis, Lobelia tenuior, Angianthus preissianus and Velleia sp. (Houston 2000).	**Unlikely** No suitable habitat within site.
Synemon gratiosa	Graceful sun-moth	P4	-	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the preferred host plant Lomandra maritima. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread (DEC 2011).	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Westralunio carteri	Carter's freshwater mussel	VU	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Also occupies lentic systems including large water supply dams and even on-stream farm dams. Salinity tolerance quite low (Morgan et al. 2011).	**Unlikely** No suitable habitat within site.
Mammals					
Bettongia penicillata ogilbyi	Woylie	CR	EN	Woodlands and adjacent heaths with a dense understorey of shrubs, particularly Gastrolobium spp. (TSSC 2018).	**Unlikely** No suitable habitat within site and outside current known distribution.
Dasyurus geoffroii	Chuditch	VU	VU	Wide range of habitats from woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. Appears to utilise native vegetation along roadsides in the wheatbelt (DEC 2012b).	**Unlikely** No suitable habitat within site.
Hydromys chrysogaster	Rakali	P4	-	Areas with permanent water, fresh, brackish or marine. Likely to occur in all major rivers and most of the larger streams as well as bodies of permanent water in the lower south-west (Christensen et al. 1985).	**Unlikely** No suitable habitat within site.
Isoodon fusciventer	Quenda	P4	-	Dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC 2012)	**Unlikely** No suitable habitat within site.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Macroderma gigas	Ghost bat	VU	VU	Requires undisturbed roost caves or mineshafts, usually complex systems with several openings (Menkhorst and Knight 2011).	**Unlikely** No suitable habitat within site and outside current known distribution.
Myrmecobius fasciatus	Numbat	EN	EN	Generally dominated by Eucalyptus spp. that provide hollow logs and branches for shelter and termites for food (van Dyck & Strahan 2008).	**Unlikely** No suitable habitat within site and outside current known distribution.
Notamacropus irma	Western brush wallaby	P4	-	Dry sclerophyll forest, Banksia spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover (Christensen and Strahan 1983).	**Unlikely** No suitable habitat within site and outside current known distribution.
Phascogale tapoatafa wambengi	South-western brush-tailed phascogale	CD	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover (Triggs 2003).	**Unlikely** No suitable habitat within site.
Pseudocheirus occidentalis	Western ringtail possum	CR	CR	On the Swan Coastal Plain in Agonis flexuosa woodlands and Agonis flexuosa/ Eucalyptus gomphocephala forests. Also Eucalyptus marginata forests (DBCA 2017).	**Unlikely** No suitable habitat within site and outside current known distribution.
Setonix brachyurus	Quokka	VU	VU	On the mainland mostly dense streamside vegetation or shrubland and heath areas, particularly around swamps (Cronin 2007).	**Unlikely** No suitable habitat within site and outside current known distribution.

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		TOWN OF VICTORIA PARK Received: 07/01/2025
Reptiles					
Lerista lineata	Perth slider	P3	-	Sandy coastal heath and low scrubland. Banksia spp. woodland, Eucalyptus gomphocephala open woodland over deep sands, and coastal dunes immediately adjacent to the beach (Wilson and Swan 2017).	**Unlikely** No suitable habitat within site.
Neelaps calonotos	Black-striped snake	P3	-	Coastal and near-coastal dunes, sandplains supporting heathlands and Banksia spp. woodlands (Bush et al. 2002).	**Unlikely** No suitable habitat within site.
Pseudemydura umbrina	Western swamp tortoise	CR	CR	Clay based ephemeral swamps (Bush et al. 2002).	**Unlikely** No suitable habitat within site.

Note: CE=critically endangered, EN=endangered, VU=vulnerable, CD=conservation dependent, MI=migratory, OS=other specially protected, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4. Species recorded or considered to potentially occur within the site are shaded green.

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Appendix C

Black Cockatoo Habitat Assessment State Hockey Centre, Bentley (Emerge Associates 2022)

TECHNICAL MEMORANDUM
Black Cockatoo Habitat Assessment
State Hockey Centre, Bentley

PROJECT NUMBER	EP22-034(03)	**DOC. NUMBER**	EP22-034(03)—006 NAW
PROJECT NAME	State Hockey Centre	**CLIENT**	Department of Finance
AUTHOR	NAW	**REVIEWER**	RAW
VERSION	1	**DATE**	2/06/2022

1. INTRODUCTION

1.1. Project background

Emerge Associates (Emerge) were engaged by Cox Architecture, on behalf of the Department of Finance (DoF), to undertake a black cockatoo habitat assessment at the Perth Hockey Centre located at Curtin University in Bentley (herein referred to as the 'site').

The site is located approximately 6 kilometres (km) south-east of the Perth Central Business District within the City of Canning. The site extends over approximately 10 ha and is bounded by Dumas Road to the east, Hayman Road to the north, Karak Drive and a carpark to the west and University Boulevard to the south. The location of the site is shown in **Figure 1**.

1.2. Purpose and scope of work

A black cockatoo habitat assessment was required to support planning and initial design for the proposed State Hockey Centre and the preparation of a Project Definition Plan. Specifically, the scope of work was to provide sufficient detail on the black cockatoo[1] values.

within the site to inform this process.

As part of the scope of work the following tasks were completed:

- Desktop review of relevant background information pertaining to the site and surrounds.
- A field survey to record black cockatoo habitat values.
- Documentation of the desktop assessment, methodology, field surveys and results into a report.

2. METHODS

2.1. Desktop assessment

A search was conducted for records of black cockatoos and potential black cockatoo habitat mapping occurring within 12 km of the site using a range of publicly available regional studies and datasets. Detailed information on each dataset considered as part of the desktop review is provided in **Appendix A.**

[1] Black cockatoos refer to two species listed under the *Environment Protection and Biodiversity Act 1999*: *Calyptorhynchus banksia naso* (forest red-tailed black cockatoo) and *Zanda latirostris* (Carnaby's black cockatoo)

2.2. Field survey

Two ecologists from Emerge visited the site on 21 April 2022 to conduct the black cockatoo survey. Transects were traversed across the site and the presence of potential black cockatoo breeding, night roosting and foraging habitat was recorded. If observed, the presence of black cockatoos within or near the site was noted. Active searches for evidence of breeding, roosting and foraging activity such as chew marks, branch clippings, droppings, moulted feathers and chewed marri or banksia fruit were conducted.

2.2.1. Breeding habitat

A 'habitat tree' was defined as a native eucalypt that is typically known to support black cockatoo breeding such as *Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah), *E. patens* (blackbutt), *E. gomphocephala* (tuart), *E. wandoo* (wandoo), *E. salmonophloia* (salmon gum) or to a lesser extent *E. rudis* (flooded gum), with a DBH ≥50 cm or DBH ≥30 cm for wandoo or salmon gum. As any tree that has a suitable hollow may provide breeding habitat for black cockatoos, other tree species were also considered to be habitat trees if they contained a suitable hollow.

To be suitable for use as breeding habitat by black cockatoos it was considered a hollow must:

- have an entrance opening of at least 10 cm but preferably 20-30 cm (Saunders *et al.* 1982; Groom 2010; Johnstone *et al.* 2013)
- be located at least 3 m from the ground (Saunders 1979b; Johnstone and Storr 1998; Groom 2010; Saunders 2014)
- be located in a trunk or branch that is generally large enough to contain a hollow that has a floor diameter of at least 40 cm and depth of 50-200 cm such that it could house an adult black cockatoo and nestlings (Saunders 1979a; Johnstone and Storr 1998; Saunders 2014; DPaW 2015)
- have vertical or near vertical orientation (Johnstone and Kirkby 2008; Johnstone *et al.* 2013).

Occasionally, native eucalypts were encountered that met DBH requirements but did not contain a trunk/branch of a sufficient size to support a hollow suitable for use by black cockatoos. For example, the tree may have been less than 3 m tall or had a trunk that forked between 1.3 m and 3 m in height and after the fork no limbs had a diameter of ≥50 cm or ≥30 cm for wandoo or salmon gum. These trees were not recorded as habitat trees as the likelihood they would form a suitable hollow was low.

Habitat trees were individually identified and the attributes outlined in **Table 1** were recorded for each tree.

Table 1: Attributes recorded for each habitat tree in the site

Attribute	Description
Image	Trees were individually photographed
GPS location	The location was recorded using a handheld GPS unit
Tree species	Species and common name were identified
Diameter at breast height (DBH) (cm)	DBH was measured at breast height (1.3 m) using a diameter tape
Hollows potentially suitable for breeding by a black cockatoo	Number of hollows potentially suitable for breeding by a black cockatoo recorded (assessed from ground level only)

Each habitat tree was assigned to a category listed in **Table 2**.

Table 2: Habitat tree categories

Category	Specifications
Nest	The tree contains a hollow used by black cockatoos for breeding as confirmed by records of black cockatoos, their eggs or fledglings or other evidence of recent nesting activity by black cockatoos.
Suitable hollow(s) with signs of use	The tree contains one or more hollows that are suitable for use by black cockatoos as breeding habitat as confirmed by internal hollow inspection^ and potential evidence of use by black cockatoos such as feathers, chew marks or nest material has been recorded within a hollow.
Suitable hollow(s)	The tree contains one or more hollows that are suitable for use by black cockatoos as breeding habitat as confirmed by internal hollow inspection^.
Potentially suitable hollow(s)	The tree contains or is suspected to contain one or more hollows that have the potential to be suitable for use by black cockatoos when either viewed from the ground or following an internal hollow inspection that was inconclusive^.
No suitable hollow(s)	The tree does not contain hollow(s) that have the potential to be suitable for use by black cockatoos when viewed from the ground or contains hollows that were determined to be unsuitable for use by black cockatoos by internal inspection^.

2.2.2. Roosting habitat

The presence of active or historical roosts was determined through evidence of roosting activity, such as branch clippings, droppings or moulted feathers.

A roost survey was undertaken between 5:20 pm and 6:20 pm (with sunset being at 5:50 pm). During the survey the ecologists looked and listened for black cockatoos and recorded any that landed on trees within the site (and remained roosting there on conclusion of the survey).

2.2.3. Foraging habitat

Foraging habitat was identified by assessing vegetation in the site for plant species known to provide food for black cockatoos (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Groom 2011; Johnstone *et al.* 2011; DSEWPaC 2012). Plant species not native to Western Australia are denoted by an asterisk ('*') in text and raw data.

Primary food plants were defined as those with historical and contemporary records of regular consumption by a black cockatoo species. Secondary food plants were defined as plants that black cockatoo species have been recorded consuming occasionally or that, based on their limited extent or agricultural origin, should not be considered a sustaining resource. A list of plant species classified as primary or secondary food plants is provided as **Appendix B.**

The value of foraging habitat was then further classified as 'high', 'moderate' or 'low' value based on the proportion of 'primary' or 'secondary' food plants it contained as outlined in **Table 3**.

Table 3: Foraging value categories

Value	Definition
High	Greater than 50% primary food plants
Moderate	Greater than 10% to 50% primary food plants
Low	10% or less primary food plants

Each patch of foraging habitat was assigned a foraging value for each species of black cockatoo likely to occur within the site. As it is not always possible to separate out food plants from non-food plants, mapped foraging habitat may also include vegetation comprising non-food plants. The proportion of non-food plants in mapped foraging habitat was minimised as far as practicable.

Evidence of black cockatoo foraging, such as chewed fruits, was searched for within the site and allocated to a species where possible.

3. RESULTS

3.1. Desktop assessment

The site is located within the distribution range of Carnaby's black cockatoo and forest red-tailed black cockatoo. However, the site is located outside the Baudin's black cockatoo distribution range (DoEE 2016c, b, a).

The site is located outside the Carnaby's black cockatoo modelled breeding range (DoEE 2016b, a).

No breeding range information for forest red-tailed black cockatoo is provided in DoEE (2016c). However, on the Swan Coastal Plain the species is known to breed near Baldivis, Mundijong, Stake Hill, Karnup, Murdoch and possibly Perry Lakes (Johnstone *et al.* 2017). Therefore, the site is likely in a suitable location for breeding by this species.

A roost-associated with both white-tailed black cockatoos and forest red-tailed black cockatoos occurs approximately 500 m west of the site.

The results of the black cockatoo desktop assessment are summarised in **Table 4** and shown in **Figure 2**.

Table 4: Summary of black cockatoo background review

Category	Site context	Source
Species distribution	• Site is located within the modelled distribution range of Carnaby's black cockatoo but not within its breeding range. • Site is located within the modelled distribution range of forest red-tailed black cockatoo. • Site is not located within the modelled distribution range of Baudin's black cockatoo.	(DoEE 2016a, b, c)
Carnaby's black cockatoo breeding areas (12 km radius surrounding breeding sites)	• No confirmed breeding areas intersect the site. • One possible breeding area intersects the site.	(Glossop *et al.* 2011)
Important bird areas for Carnaby's black cockatoo	• The site is not located within an important bird area for Carnaby's black cockatoo and none occur nearby.	(DPaW 2013; BirdLife International 2022)
Roost site	• None within the site. • 44 roost sites within 12 km of the site ◦ 17 associated with white-tailed^ black cockatoos only. ◦ 18 associated with forest red-tailed black cockatoos only. ◦ Nine associated with white^ and red-tailed black cockatoos.	(Peck *et al.* 2019)

Table 4: Summary of black cockatoo background review (continued)

Category		Site context	Source
Foraging habitat	Carnaby's black cockatoo	• No potential native foraging habitat is mapped within the site. • Closest area of potential native foraging habitat mapped within the wider local area is situated 1km to the north.	(Emerge Associates 2021)
		• No pine plantations mapped within the site or within 12 km.	(Forest Products Commission 2020)
	Forest red-tailed black cockatoo^	• No potential native foraging habitat is mapped within the site. • Closest area of potential native foraging habitat mapped within the wider local area is situated 1km to the north.	(Emerge Associates 2021)

Table 5: White-tailed black cockatoos recorded in roosts within 12 km of the site (Peck et al. 2019)

Roost ID	Year and number of individuals									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
CAMCITR001	NS	NS	NS	NS	2	0	0	0	NS	NS
CAMFLOR001	237	151	148	157	159	86	239	281	259	283
CANFERR001	NS	NS	NS	5	0	0	0	0	0	NS
CANWILR001	0	0	0	0	68	0	0	0	0	0
CLASWAR001	NS	NS	0	0	3	0	0	0	0	0
GOSCNVR001	0	19	NS	NS	0	0	0	0	NS	80
GOSCNVR002	NS	NS	26	52	0	0	151	0	0	0
KALMAIR002	NS	NS	NS	NS	0	NS	0	0	0	11
KINPERR001	0	NS	0	NS	0	0	0	8	0	0
MELBATR001	8	0	0	0	0	0	0	0	0	0
MELKARR002	0	0	0	NS	0	55	0	0	0	0
MELLEER001	0	0	12	0	70	0	0	0	15	2
MELMURR001	700	60	142	127	234	24	78	0	227	249
MELWINR001	NS	56	81	70	41	0	21	0	0	12
MELWINR003	117	130	NS	NS	NS	0	7	54	NS	NS
MELWINR004	0	0	0	0	2	0	0	0	0	NS
NEDDALR003	40	90	0	0	0	0	0	0	0	0
NEDNEDR001	73	103	304	183	114	106	216	242	175	353
NEDNEDR002	NS	NS	NS	NS	0	11	0	0	0	3

Table 5: White-tailed black cockatoos recorded in roosts within 12 km of the site (Peck et al. 2019)

Roost ID	Year and number of individuals									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
NEDNEDR003	NS	NS	NS	NS	0	2	33	96	47	0
SOUCOMR001	408	645	558	301	402	460	242	289	470	563
SOUSALR001	12	0	0	0	5	0	0	0	2	0
SOUSOUR002	0	35	0	0	0	0	0	0	0	0
SUBSHER001	0	0	0	9	0	0	0	0	0	0
VICKENR001	0	NS	0	0	0	0	0	0	0	2
VICVICR001	2	0	0	0	0	0	6	0	0	0

NS = not surveyed

Table 6: Forest red-tailed black cockatoo recorded in roosts within 12 km of the site (Peck et al. 2019)

Roost ID	Year and number of individuals					
	2014	2015	2016	2017	2018	2019
BAYEMBR002	NS	NS	NS	NS	34	NS
BAYMAYR001	NS	NS	0	0	NS	4
CAMFLOR002	109	NS	49	261	360	837
CANRIVR001	NS	NS	6	11	7	16
CANROSR001	NS	NS	0	0	14	2
CANWILR001	4	7	7	5	16	82
COCCOOR003	NS	NS	57	6	71	33
GOSCNVR001	2	0	0	0	NS	0
GOSCNVR002	0	4	0	0	0	0
GOSKENR001	NS	NS	NS	51	334	35
GOSKENR002	NS	NS	NS	NS	72	0
KALFORR002	NS	NS	NS	NS	42	65
KALFORR003	NS	NS	NS	NS	31	10
KALHIGR001	NS	NS	NS	7	78	5
KALMAIR002	25	NS	56	98	137	304
MELLEER001	0	0	11	25	5	0
MELMURR001	199	33	125	209	441	214

Table 6: Forest red-tailed black cockatoo recorded in roosts within 12 km of the site (Peck et al. 2019)

Roost ID	Year and number of individuals					
	2014	2015	2016	2017	2018	2019
MOSMOSR001	0	0	0	0	0	3
SOUCOMR001	0	0	0	0	0	1
SOUSALR001	2	0	0	0	8	0
STIMENR002	0	NS	0	5	0	0
STIYOKR002	0	1	0	NS	83	142
STIYOKR003	47	28	0	239	276	391
VICKENR001	94	121	0	116	108	140
VICKENR002	NS	35	42	0	NS	NS
VICLATR001	0	0	0	0	15	32
VICWATR002	NS	NS	0	45	85	51

NS = not surveyed

3.2. Habitat

Carnaby's black cockatoo was recorded in the site during the field survey with multiple individuals observed perched in pine trees. The forest red-tailed black cockatoo was not recorded but is likely to occur.

3.2.1. Breeding

Five black cockatoo habitat trees were recorded within the site as shown in **Figure 3**.

The habitat trees comprised two marri and three flooded gums. None contained suitable hollows for breeding by black cockatoos.

A summary of the habitat trees recorded within the site is provided in **Table 7** and an inventory in **Appendix C**.

Table 7: Habitat trees recorded within the site

Category	No. trees
Nest	0
Suitable hollow(s) with signs of use	0
Suitable hollow(s)	0
Potentially suitable hollow(s)	0
No suitable hollow(s)	5

3.2.2. Roosting

No roosts or evidence of roosting were observed within the site during the survey.

Native and non-native trees within the site have the potential to provide roosting habitat for black cockatoos.

3.2.3. Foraging

A total of 2.02 ha of foraging habitat for Carnaby's black cockatoo, and 0.61 ha for forest red-tailed black cockatoo were recorded in the site as shown in **Figure 4** and **Figure 5**.

The majority of the foraging habitat occurs as scattered trees and shrubs and comprises a combination of primary, secondary and non-food plants. Dominant primary food plants are **Pinus pinaster* (pinaster pine) and marri. Dominant secondary food plants include **Agonis flexuosa* (peppermint tree), **Casuarina cunninghamiana* (river sheoak) and **Eucalyptus camaldulensis* (red river gum).

The extent of foraging habitat by value category is detailed in **Table 8**.

Table 8: Foraging habitat values recorded within the site

Foraging value	Black cockatoo species and area of foraging habitat (ha)	
	Carnaby's	Forest red-tailed
High	1.33	0.17
Moderate	0.45	0.26
Low	0.24	0.18
Total	**2.02**	**0.61**

4. CONCLUSIONS

The site has been subject to intensive historical disturbance, with the majority of the site supporting non-native vegetation.

The site occurs within the modelled distribution of Carnaby's black cockatoo and forest red-tailed black cockatoo but outside of the modelled distribution of Baudin's black cockatoo. Carnaby's black cockatoo was recorded in the site during the field survey and forest red-tailed black cockatoo is likely to occur.

The site contains five habitat trees, none of which contain hollows suitable for use by black cockatoos for breeding. Therefore, the site does currently not provide breeding habitat for any species of black cockatoo.

No roosts or evidence of roosting by any species of black cockatoo was recorded within the site during the field survey. Tall native and non-native trees within the site represent suitable roosting habitat for species of black cockatoo. White-tailed black cockatoo (most likely Carnaby's black cockatoo) and forest red-tailed black cockatoo roosts occur in close proximity to the site (Peck *et al.* 2019).

A total of 2.02 ha of foraging habitat for Carnaby's black cockatoo was mapped within the site of which 1.33 ha (65.84%) provides a high value resource, 0.45 ha (22.28%) provides a moderate value resource and 0.24 ha (11.88%) provides a low value resource.

A total of 0.61 ha of foraging habitat for forest red-tailed black cockatoo was mapped in the site of which 0.17 ha (27.87%) provides a high value resource, 0.26 ha (42.62%) provides a moderate value resource and 0.18 ha (29.51%) provides a low value resource.

Additional areas of foraging habitat of similar or higher value occur adjacent to the site and in the wider local area.

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5.2. Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 5.1**, with access date information provided in **Table R 1**.

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
BirdLife International (2022)	16 May 2022	Important Bird Areas
DAWE (2022)	6 May 2022	Protected Matters Search Tool
DBCA (2022)	6 May 2022	NatureMap
WALIA (2022)	16 May 2022	Landgate Map Viewer

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Figures

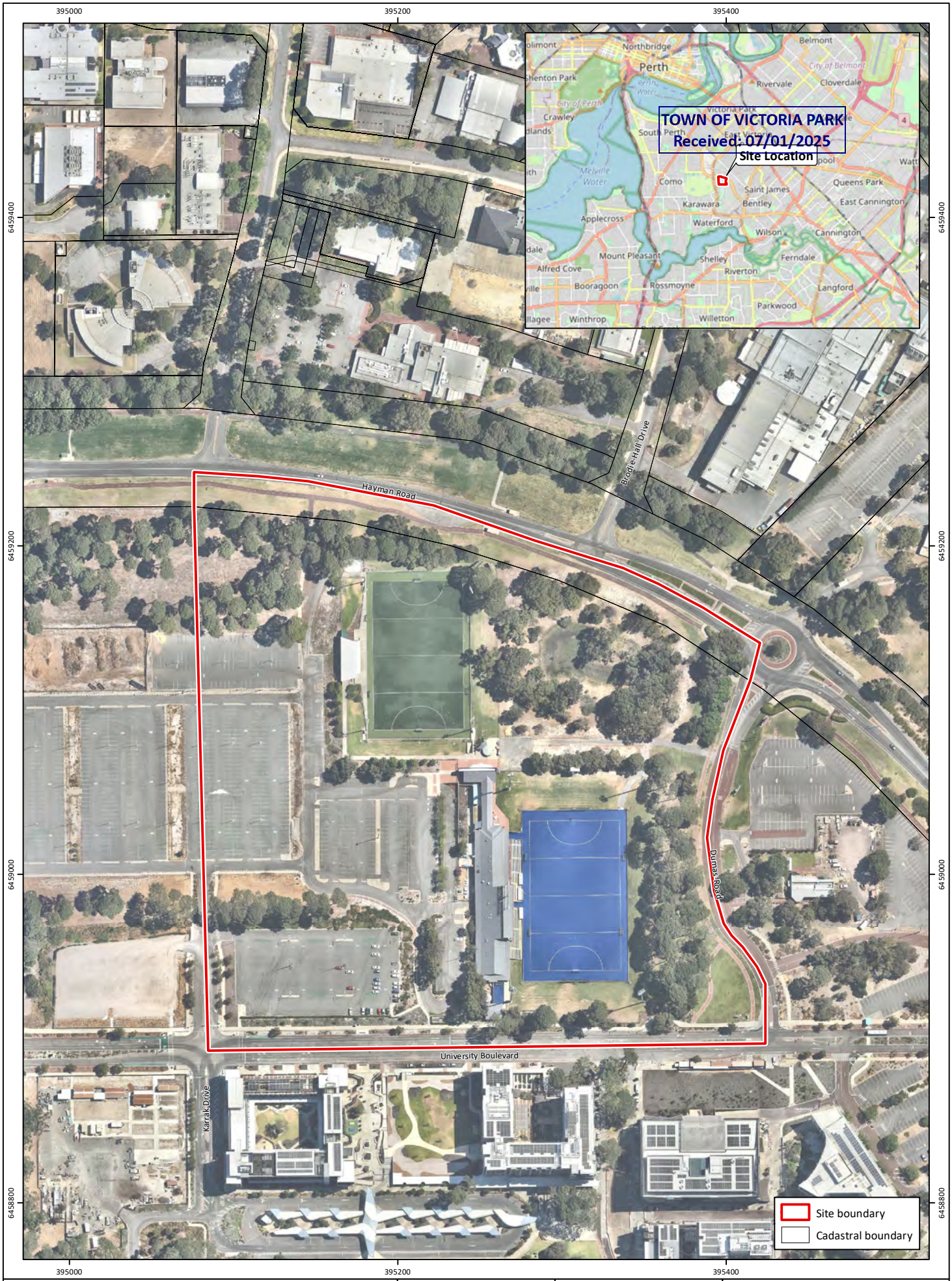

Figure 1: Site Location

Project:	Black Cockatoo Habitat Asssessment State Hockey Centre
Client:	Department of Finance

Plan Number:
EP22-034(03)--F08

Drawn:	GAR
Date:	20/05/2022
Checked:	NAW
Approved:	RAW
Date:	01/06/2022

N

0 40 80
Metres

Scale: 1:3,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

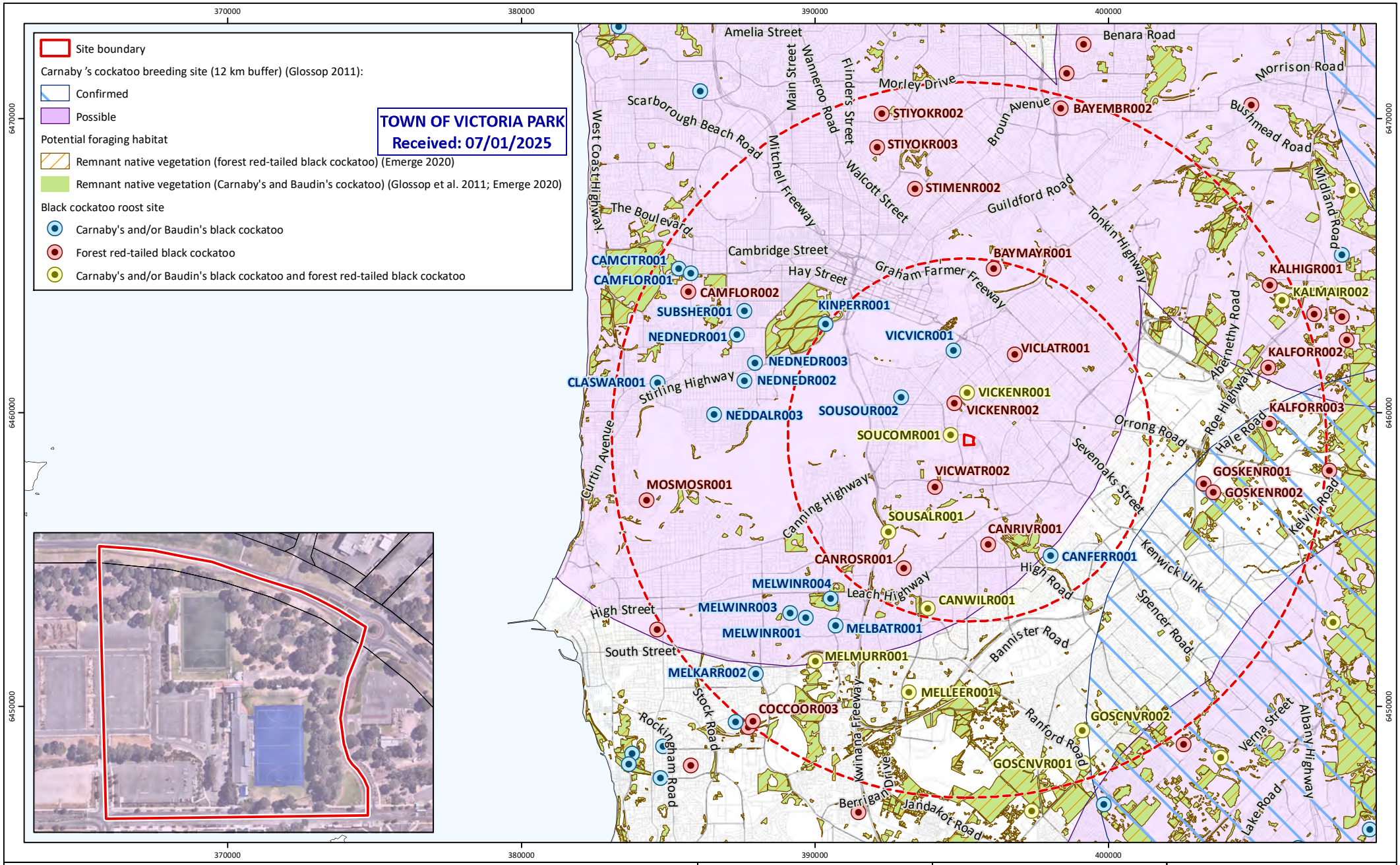

Figure 2: Black Cockatoo Habitat Context

Project:	Black Cockatoo Habitat Asssessment State Hockey Centre
Client:	Department of Finance

Plan Number:
EP22-034(03)--F09

Drawn:	GAR
Date:	20/05/2022
Checked:	NAW
Approved:	RAW
Date:	01/06/2022

N

0 2 4 6
Kilometers

Scale: 1:170,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Figure 3: **Black Cockatoo Habitat Trees**

Project: Black Cockatoo Habitat Asssessment
State Hockey Centre
Client: Department of Finance

Plan Number: EP22-034(03)--F10
Drawn: GAR
Date: 20/05/2022
Checked: NAW
Approved: RAW
Date: 01/06/2022

N

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Metres
Scale: 1:2,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

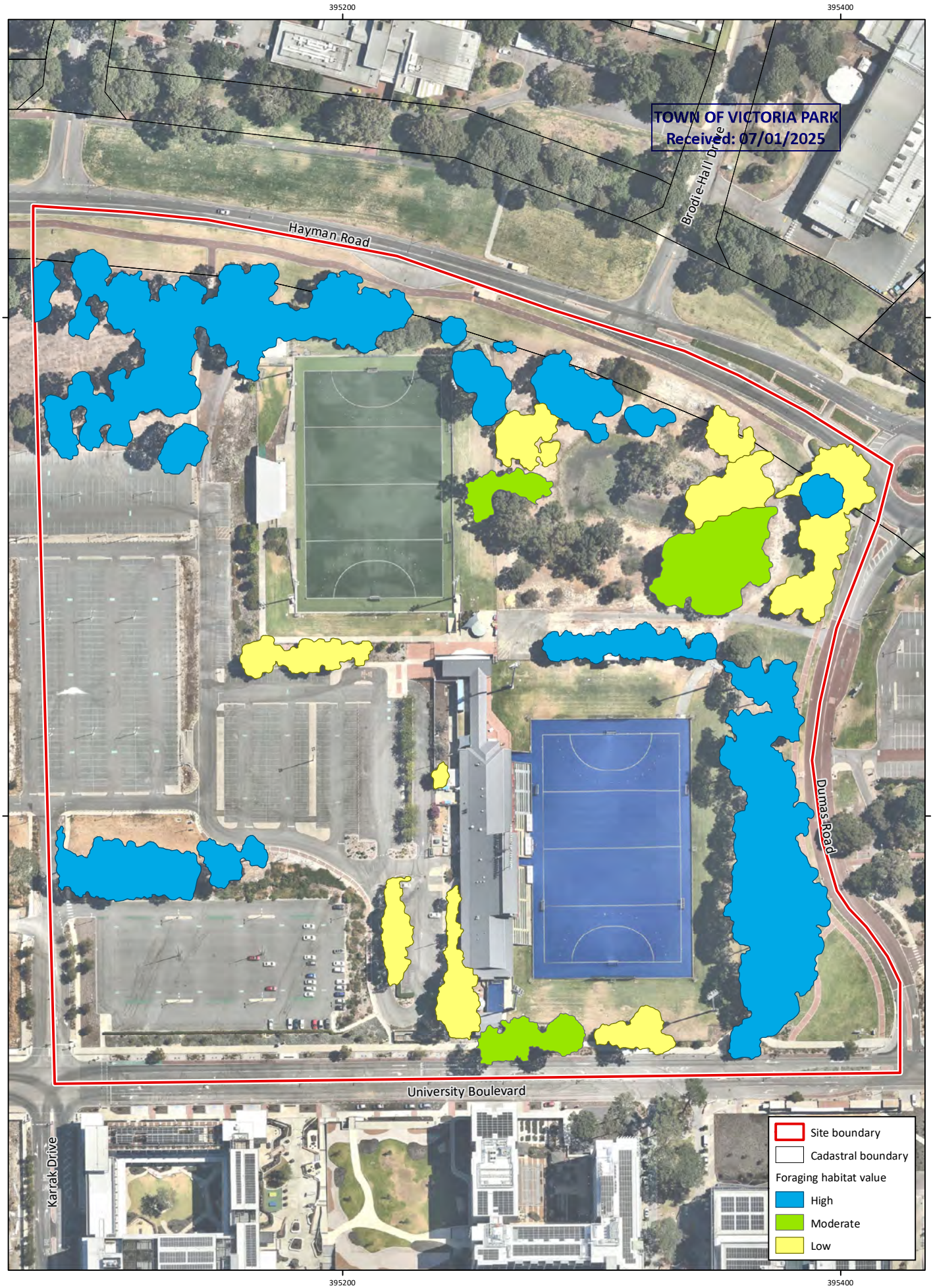

Figure 4: Carnaby's Cockatoo Foraging Habitat

Project: Black Cockatoo Habitat Asssessment
State Hockey Centre
Client: Department of Finance

Plan Number: EP22-034(03)--F11
Drawn: GAR
Date: 20/05/2022
Checked: NAW
Approved: RAW
Date: 01/06/2022

N

0 25 50
Metres
Scale: 1:2,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

Figure 5: **Forest Red-tailed Black Cockatoo Foraging Habitat**

Project: Black Cockatoo Habitat Asssessment
State Hockey Centre

Client: Department of Finance

Plan Number: EP22-034(03)--F12

Drawn:	GAR
Date:	20/05/2022
Checked:	NAW
Approved:	RAW
Date:	01/06/2022

N

0 25 50
Metres

Scale: 1:2,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Appendix A

Additional Information

Conservation Significant Fauna

Threatened and priority fauna

Fauna species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. At the Commonwealth level, fauna species can be listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as 'threatened', 'migratory' or 'marine' as described in **Table 1**.

Migratory species comprise birds recognised under international treaties including:

- *Japan Australia Migratory Bird Agreement 1981* (JAMBA)
- *China Australia Migratory Bird Agreement 1998* (CAMBA)
- *Republic of Korea-Australia Migratory Bird Agreement 2007* (ROKAMBA)
- *Bonn Convention 1979* (The Convention on the Conservation of Migratory Species of Wild Animals).

Fauna species listed as threatened and migratory are protected in Australia as 'matters of national environmental significance' (MNES) under the EPBC Act.

Table 1: Definitions of conservation significant fauna species pursuant to the EPBC Act

Conservation Code	Category
X	Threatened Fauna –Extinct There is no reasonable doubt that the last member of the species has died.
EW#	Threatened Fauna –Extinct in the Wild Taxa which are known only to survive in cultivation, captivity or as a naturalised population outside its past range, or taxa which have not been recorded in its known and/or expected habitat despite appropriate exhaustive surveys.
CR#	Threatened Fauna – Critically Endangered Taxa which are considered to be facing an extremely high risk of extinction in the wild.
EN#	Threatened Fauna – Endangered Taxa which are considered to be facing a very high risk of extinction in the wild.
VU#	Threatened Fauna – Vulnerable Taxa which are considered to be facing a high risk of extinction in the wild.
Migratory#	Migratory Fauna All migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and All native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Ma	Marine Fauna Species in the list established under s248 of the EPBC Act

#matters of national environmental significance (MNES) under the EPBC Act

In Western Australia, fauna taxa may be classed as 'threatened', 'extinct', or 'specially protected' under the *Biodiversity Conservation Act 2016* (BC Act), which is enforced by Department of Biodiversity Conservation and Attractions (DBCA) (DBCA 2019a). The definitions of these categories are provided in **Table 2**.

Table 2: Definitions of specially protected fauna schedules under the BC Act (DBCA 2019a)

Category	Conservation Code	Definition
Threatened	CR	Critically endangered Threatened species considered to be facing an extremely high risk of extinction in the wild in the immediate future.
	EN	Endangered Threatened species considered to be facing a very high risk of extinction in the wild in the near future.
	VU	Vulnerable Threatened species considered to be facing a high risk of extinction in the wild in the medium-term future.
Extinct	EX	Extinct Species where there is no reasonable doubt that the last member of the species has died.
	EW	Extinct in the wild Species that is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form. Note that no species are currently listed as EW.
Specially protected	MI	Migratory species Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth Includes birds that subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds.
	CD	Species of special conservation interest (conservation dependent fauna) Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
	OS	Other specially protected species Fauna otherwise in need of special protection to ensure their conservation.

Fauna species that may be threatened or near threatened but lack sufficient information to be legislatively listed may be added to the DBCA's *Priority Fauna List* (DBCA 2018b). Species listed under priorities 1-3 comprise possible threatened species that do not meet survey criteria or are otherwise data deficient. Species listed under priority 4 are those that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons (DBCA 2019a).

Priority fauna species are considered during State approval processes. Priority fauna categories and definitions are listed in **Table 3** (DBCA 2019a).

Table 3: Definitions of priority fauna categories on DBCA's Priority Fauna List (DBCA 2019a)

Conservation Code	Category
P1	Priority 1 – Poorly known Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	Priority 2 – Poorly known Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included 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. Such species are in urgent need of further survey.
P3	Priority 3 – Poorly known Species that are known from several locations and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	(a) Priority 4 – Rare species 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. (b) Priority 4 – Near Threatened Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (c) Priority 4 – Other Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Black cockatoos

Three threatened species of black cockatoo occur on the Swan Coastal Plain (referred to herein collectively as 'black cockatoos'):

- *Zanda*[1] *latirostris* (Carnaby's black cockatoo) which is listed as 'endangered' under the EPBC Act and the BC Act.
- *Zanda*[1] *baudinii* (Baudin's black cockatoo) which is listed as 'endangered' under the EPBC Act and the BC Act.
- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) which is listed as 'vulnerable' under the EPBC Act and the BC Act.

There are a range of regional studies and spatial datasets available which provide information on black cockatoo records and potential habitat mapping. These are detailed below.

Species distribution and breeding range

Broad-scale maps are available for the modelled distribution of Baudin's black cockatoo, Carnaby's black cockatoo and forest red-tailed black cockatoo (DSEWPaC 2011; DoEE 2016a, b).

The modelled distribution maps also include 'known breeding areas' and 'predicted breeding range' for Baudin's black cockatoo and 'breeding range' and 'non-breeding range' for Carnaby's black cockatoo.

No breeding range modelling is available for forest red-tailed black cockatoo but the species is known to breed mainly in the jarrah forest region (DBCA 2017a) and in small populations on the Swan Coastal Plain within the Baldivis, Stake Hill, Lake McLarty and Capel area and increasingly in the Perth metropolitan area (DAWE 2020).

Breeding habitat

Department of Environment and Conservation (DEC, now Department of Biodiversity, Conservation and Attractions (DBCA)) and fauna experts, have identified and mapped Carnaby's black cockatoo habitat on the Swan Coastal Plain and Jarrah Forest regions (Glossop *et al.* 2011). This dataset includes mapping of Carnaby's black cockatoo breeding sites based on point records of breeding from a range of sources. Breeding sites were classified as 'confirmed' where eggs or chicks were recorded and 'possible' where observations relating to Carnaby's black cockatoo breeding that did not include actual records of eggs or chicks (e.g. chewed hollows or records of breeding or nesting behaviour by an expert observer).

A 12 km buffer applies to each site to 'reflect the flexible use of these areas by cockatoos and to indicate the important zone for access to potential feeding habitat' (Glossop *et al.* 2011). Glossop *et al.* (2011) state that the areas mapped in the dataset are not a comprehensive record of Carnaby's black cockatoo breeding and that many nesting sites are not known.

While this dataset only applies to Carnaby's black cockatoo, the information it contains is also applicable for Baudin's black cockatoo and forest red-tailed black cockatoo as they have similar

[1] Previously *Calyptorhynchus*

breeding habitat requirements. That is, breeding sites that are suitable for Carnaby's black cockatoo may also be suitable for Baudin's black cockatoo and forest red-tailed black cockatoo, if located within their distribution/breeding ranges.

BirdLife Australia also maintain a database of confirmed black cockatoo breeding sites which is accessible via a paid search system. BirdLife Australia have advised that their database is comprised of data collected during surveys by staff and volunteers of which most (>99%) surveys are of Carnaby's black cockatoo. They have also advised that the dataset is not comprehensive and that an absence of known nests does not necessarily indicate a lack of breeding activity.

The Carnaby's black cockatoo recovery plan also identifies 13 'important bird areas' for Carnaby's black cockatoo, which are identified as 'sites of global bird conservation importance' (DPaW 2013). These 'important bird areas' comprise sites supporting at least 20 breeding pairs or 1% of the population regularly utilising an area in the non-breeding part of the range.

Confirmed roost sites

BirdLife Australia undertakes annual monitoring of black cockatoo overnight roost sites as part of the annual 'Great Cocky Count' community-based survey. Information gathered from these monitoring events provides roost locations and recorded black cockatoo numbers (Peck *et al.* 2019).

Native foraging habitat

Glossop et al. (2011) also mapped 'areas requiring investigation as Carnaby's black cockatoo feeding habitat' for the Swan Coastal Plain and Jarrah Forest regions, based on regional vegetation mapping that may contain plant species known to be foraged upon by Carnaby's black cockatoo. Note that this dataset does not include observations or point records of Carnaby's black cockatoo feeding. This dataset represents areas of vegetation that may potentially provide foraging habitat for Carnaby's black cockatoo.

In order to account for clearing of native vegetation that has occurred since the Glossop et al. (2011) dataset was created and to incorporate updated vegetation mapping and information on foraging behaviour of Carnaby's black cockatoo, Emerge have revised this dataset to represent the most up to date information available. Furthermore, Emerge have used a similar methodology to Glossop et al. (2011) to define potential foraging habitat for Baudin's black cockatoo and forest-red tailed cockatoos.

Specifically, DBCA (2021), DBCA (2019b) and DPIRD (2018) regional vegetation complex mapping was used to determine which areas of remnant vegetation support plant species known to be foraged upon by Carnaby's black cockatoo, Baudin's black cockatoo or forest red-tailed cockatoos. Where these vegetation complexes intersect remnant vegetation mapped by DPIRD (2020) they were considered to represent potential foraging habitat for Carnaby's black cockatoo, Baudin's black cockatoo and/or forest red-tailed cockatoo.

Pine plantations also provide an important food source for Carnaby's black cockatoo, but were not included in the original Glossop et al. (2011) dataset. Mapping of pine plantations is available from the Forest Products Commission (Forest Products Commission 2020) and was considered in the assessment of Carnaby's black cockatoo foraging habitat.

Pest fauna

A number of legislative and policy documents exist in relation to pest fauna management at state and national levels. The *Biosecurity and Agriculture Management Act 2007* (BAM Act) is the principle legislation guiding pest fauna management in Western Australia and lists declared pest species.

Declared Pests

Part 2.3.23 of the BAM Act requires a person must not; "*a) keep, breed or cultivate the declared pest; b) keep, breed or cultivate an animal, plant or other thing that is infected or infested with the declared pest; c) release into the environment the declared pest, or an animal, plant or other thing that is infected or infested with the declared pest; or d) intentionally infect or infest, or expose to infection or infestation, a plant, animal or other thing with a declared pest*".

Under the BAM Act, all declared pests are assigned a legal status, as described in **Table 4**. Species assigned to the 'declared pest, prohibited - s12' category are placed in one of three control categories, as described in **Table 5**.

The *Biosecurity and Agriculture Management Regulations 2013* specify keeping categories for species assigned to the 'declared pest - s22(2)' category, which relate to the purposes of which species can be kept, as well as the entities that can keep them. The categories are described in **Table 6**.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act (DAFWA 2016).

Table 4: Legal status of declared pest species listed under the BAM Act (DAFWA 2016)

Category	Description
Declared Pest Prohibited - s12	May only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest s22(2)	Must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia

Table 5: Control categories of declared pest species listed under the BAM Act (DAFWA 2016)

Category	Description
C1	Exclusion Not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2	Eradication Present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3	Management Established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Table 6: Keeping categories of declared pest species listed under the BAM Act (DAFWA 2016)

Category	Description
Prohibited	Can only be kept under a permit for public display and education purposes, and/or genuine scientific research, by entities approved by the state authority.
Exempt	No permit or conditions are required for keeping.
Restricted	Organisms which, relative to other species, have a low risk of becoming a problem for the environment, primary industry or public safety and can be kept under a permit by private individuals.

Wetland Habitat

Geomorphic wetland types

On the Swan Coastal Plain DBCA (2017b) have used the geomorphic wetland classification system developed by Semeniuk (1987) and Semeniuk and Semeniuk (1995) to classify wetlands based on the landform shape and water permanence (hydro-period) as outlined in **Table 7**. DBCA maintains a dataset of the *Geomorphic Wetlands of the Swan Coastal Plain* (DBCA 2018a).

Table 7: Geomorphic Wetlands of the Swan Coastal Plain classification categories (DBCA 2017b)

Level of inundation	Geomorphology			
	Basin	Flat	Channel	Slope
Permanently inundated	Lake	-	River	-
Seasonally inundated	Sumpland	Floodplain	Creek	-
Seasonally waterlogged	Dampland	Palusplain	-	Paluslope

Literature

The main literature used for identifying fauna and fauna habitats is listed in **Table 8** below.

Table 8: Standard literature used for identifying fauna species and habitats.

Conservation Code	Category
Birds	Johnstone and Storr (1998b), Johnstone and Storr (1998a), Pizzey and Knight (2012), Slater *et al.* (2003)
Mammals	Menkhorst and Knight (2011), Triggs (2003)
Amphibia	Tyler and Doughty (2009), Bush *et al.* (2002)
Reptiles	Bush *et al.* (2002)

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Appendix B

Black Cockatoo Foraging Plants

		Foraging category as assigned by Emerge			
Species name	**Common name**	**CBC**	**BBC**	**FRTBC**	**Literature references**
Acacia baileyana	Cootamundra wattle	Secondary	-	-	Groom 2011
Acacia pentadenia	Karri wattle	Secondary	-	-	Groom 2011
Acacia saligna	Orange wattle	Secondary	-	-	Groom 2011
Agonis flexuosa	Peppermint tree	Secondary	-	-	Groom 2011
Allocasuarina fraseriana	Sheoak	-	Secondary	Secondary	Johnstone & Storr 1998; Johnstone et al. 2010; Johnstone 2017; DoEE 2017
Allocasuarina spp.		Secondary	-	Secondary	Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Anigozanthos flavidus	Tall kangaroo paw	-	Secondary	-	Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017
Araucaria heterophylla	Norfolk island pine	Secondary	-	-	Groom 2011; DoEE 2017
Banksia ashbyi	Ashby's banksia	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia attenuata	Slender banksia	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia baxteri	Baxter's banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia carlinoides	Pink dryandra	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia coccinea	Scarlet banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia dallanneyi	Couch honeypot dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia ericifolia	Heath-leaved banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia fraseri		Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia gardneri	Prostrate banksia	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia grandis	Bull banksia	Primary	Secondary	-	Saunders 1980; Johnstone & Storr 1998; Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia hookeriana	Hooker's banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia ilicifolia	Holly banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; Johnstone & Storr 1998; DoEE 2017
Banksia kippistiana		Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia leptophylla		Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia lindleyana	Porcupine banksia	Primary	Secondary	-	Johnstone et al. 2010; DoEE 2017

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Banksia littoralis	Swamp banksia	Primary	Secondary	-	Saunders 1980; Groom 2011Johnstone & Storr 1998; Johnstone et al. 2010; DoEE 2017
Banksia menziesii	Firewood banksia	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia mucronulata	Swordfish dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia nivea	Honeypot dryandra	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia nobilis	Golden dryandra	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia praemorsa	Cut-leaf banksia	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia prionotes	Acorn banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia prolata		Primary	Secondary	-	Johnstone et al. 2010; DoEE 2017
Banksia quercifolia	Oak-leaved banksia	Primary	Secondary	-	Johnstone & Storr 1998; Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia sessilis	Parrot bush	Primary	Secondary	-	Saunders 1980; Johnstone & Storr 1998; Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia speciosa	Showy banksia	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia spp.		Primary	Secondary	-	Saunders 1979; DSEWPaC 2012; DoEE 2017
Banksia squarrosa	Pingle	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; DoEE 2017
Banksia tricuspis	Pine banksia	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia undata	Urchin dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia verticillata	Granite banksia	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Brassica campestris	Canola	Secondary	-	-	Groom 2011; DoEE 2017
Callistemon spp.		Secondary	Secondary	-	Johnstone et al. 2010; DoEE 2017
Callistemon viminalis	Captain cook bottlebrush	Secondary	-	-	Groom 2011
Callitris sp.		Secondary	-	-	Johnstone et al. 2010; Groom 2011
Carya illnoinensis	Pecan	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011; Groom 2014; DoEE 2017
Casuarina cunninghamiana	River sheoak	Secondary	-	-	Groom 2011
Citrullus lanatus	Pie or afghan melon	Secondary	-	-	Johnstone et al. 2010; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Corymbia calophylla	Marri	Primary	Primary	Primary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017; Johnstone 2017; Saunders 1979; Johnstone & Kirkby 2008
Corymbia citriodora	Lemon scented gum	Secondary	Secondary	Secondary	Johnstone et al. 2010; DSEWPaC 2012; Groom 2011; Johnstone 2017
Corymbia ficifolia	Red flowering gum	Secondary	-	-	Groom 2011
Corymbia haematoxylon	Mountain marri	Secondary	-	Secondary	Groom 2011; DoEE 2012; DoEE 2017
Corymbia maculata	Spotted gum	-	-	-	-
Darwinia citriodora	Lemon-scented darwinia	Secondary	Secondary	-	Groom 2011; Johnstone et al. 2010
Diospryros sp.	Sweet persimmon	Secondary	Secondary	-	Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eremophila glabra	Tarbush	Secondary	-	-	Groom 2011
Erodium aureum		Secondary	-	-	Groom 2011
Erodium botrys	Long storksbill	Secondary	Secondary	-	Groom 2011; Johnstone & Storr 1998; Johnstone et al. 2010
Erodium spp.		Secondary	Secondary	-	Johnstone et al. 2010; DoEE 2017
Eucalyptus caesia	Silver princess	Secondary	-	Secondary	Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017; Johnstone 2017
Eucalyptus camaldulensis	River red gum	-	-	Secondary	DoEE 2012; DoEE 2017
Eucalyptus decipiens	Red heart/moit	-	-	Secondary	Johnstone 2017
Eucalyptus diversicolor	Karri	-	-	Primary	Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017; Johnstone & Storr 1998
Eucalyptus erythrocorys	Illyarrie	Secondary	-	Secondary	DSEWPaC 2012; DoEE 2017; Johnstone 2017, Johnstone et al. 2010
Eucalyptus gomphocephala	Tuart	Secondary	-	Secondary	Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eucalyptus grandis	Flooded gum, rose gum	-	-	Secondary	DoEE 2012; DoEE 2017
Eucalyptus lehmannii	Bushy yate	-	-	Secondary	Johnstone 2017
Eucalyptus leucoxylon	Yellow gum	Secondary	-	-	Groom 2014

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Eucalyptus loxophleba	York gum	Secondary	-	-	Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eucalyptus marginata	Jarrah	Primary	Secondary	Primary	Saunders 1980; Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017; Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone 2017
Eucalyptus patens	Blackbutt	Primary	-	Primary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017; Johnstone 2017; Groom 2011
Eucalyptus pleurocarpa	Tallerack	Secondary	-	-	Groom 2011
Eucalyptus preissiana	Bell-fruited mallee	Secondary	-	-	Groom 2011
Eucalyptus robusta	Swamp mahogany	Secondary	-	-	Johnstone et al. 2010; Groom 2011
Eucalyptus salmonophloia	Salmon gum	Primary	-	-	Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DSEWPaC 2012; DoEE 2017
Eucalyptus staeri	Albany blackbutt	-	-	Secondary	Johnstone & Storr 1998
Eucalyptus todtiana	Coastal blackbutt	Secondary	-	-	Saunders 1980; Johnstone et al. 2010; Groom 2011; Johnstone & Kirkby 2008
Eucalyptus wandoo	Wandoo	Primary	Secondary	Primary	Saunders 1980; Johnstone et al. 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Ficus sp.	Fig	Secondary	-	-	Groom 2011
Grevillea armigera	Prickly toothbrushes	Primary	-	-	Groom 2011
Grevillea bipinnatifida	Fuschia grevillea	Primary	-	-	Groom 2011
Grevillea hookeriana	Red toothbrushes	Primary	-	-	Groom 2011
Grevillea hookeriana subsp. api	Black toothbrushes	Primary	-	-	Groom 2011
Grevillea paniculata	Kerosene bush	Primary	-	-	Groom 2011
Grevillea paradoxa	Bottlebrush grevillea	Primary	-	-	Groom 2011
Grevillea petrophiloides	Pink poker	Primary	-	-	Groom 2011
Grevillea robusta	Silky oak	Primary	-	-	Johnstone et al. 2010; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Grevillea spp.		Primary	-	-	Saunders 1979; Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017
Grevillea wilsonii	Native fuchsia	-	Secondary	-	Johnstone et al. 2010
Hakea auriculata		Primary	-	-	Saunders 1980; Groom 2011
Hakea candolleana		Primary	-	-	Groom 2011
Hakea circumalata	Coastal hakea	Primary	-	-	Groom 2011
Hakea commutata		Primary	-	-	Groom 2011
Hakea conchifolia	Shell-leaved hakea	Primary	-	-	Groom 2011
Hakea costata	Ribbed hakea	Primary	-	-	Groom 2011
Hakea cristata	Snail hakea	Primary	Secondary	-	Groom 2011; Johnstone et al. 2010
Hakea cucullata	Snail hakea	Primary	-	-	Groom 2011
Hakea cyclocarpa	Ramshorn	Primary	-	-	Saunders 1980; Groom 2011
Hakea eneabba		Primary	-	-	Groom 2011
Hakea erinacea	Hedgehog hakea	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011
Hakea falcata	Sickle hakea	Primary	-	-	Groom 2011
Hakea flabellifolia	Fan-leaved hakea	Primary	-	-	Groom 2011
Hakea gilbertii		Primary	-	-	Saunders 1980; Groom 2011
Hakea incrassata	Golfball or marble hakea	Primary	-	-	Johnstone et al. 2010; Groom 2011
Hakea lasiantha	Woolly flowered hakea	Primary	-	-	Johnstone et al. 2010; Groom 2011
Hakea lasianthoides		Primary	Secondary	-	Johnstone et al. 2010; Groom 2011
Hakea laurina	Pin-cushion hakea	Primary	-	-	Johnstone et al. 2010; Groom 2011
Hakea lissocarpha	Honeybush	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011
Hakea marginata		-	Secondary	-	Johnstone et al. 2010
Hakea megalosperma	Lesueur hakea	Primary	-	-	Groom 2011
Hakea multilineata	Grass leaf hakea	Primary	-	-	Groom 2011
Hakea neospathulata		Primary	-	-	Groom 2011
Hakea obliqua	Needles and corks	Primary	-	-	Saunders 1980; Groom 2011
Hakea oleifolia	Dungyn	Primary	-	-	Groom 2011

		Foraging category as assigned by Emerge			
Species name	**Common name**	**CBC**	**BBC**	**FRTBC**	**Literature references**
Hakea pandanicarpa subsp. crassifolia	Thick-leaved hakea	Primary	-	-	Groom 2011
Hakea petiolaris	Sea urchin hakea	Primary	-	-	Groom 2011
Hakea polyanthema		Primary	-	-	Groom 2011
Hakea preissii	Needle tree	Primary	-	-	Groom 2011
Hakea prostrata	Harsh hakea	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011
Hakea psilorrhyncha		Primary	-	-	Groom 2011
Hakea ruscifolia	Candle hakea	Primary	Secondary	-	Saunders 1980; Groom 2011; Johnstone et al. 2010
Hakea scoparia	Kangaroo bush	Primary	-	-	Groom 2011
Hakea smilacifolia		Primary	-	-	Groom 2011
Hakea spp.		Primary	Secondary	-	Saunders 1979; DSEWPaC 2012; DoEE 2017
Hakea stenocarpa	Narrow-fruited hakea	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011
Hakea sulcata	Furrowed hakea	Primary	-	-	Groom 2011
Hakea trifurcata	Two-leaved hakea	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011
Hakea undulata	Wavy-leaved hakea	Primary	Secondary	-	Saunders 1980; Johnstone et al. 2010; Groom 2011
Hakea varia	Variable-leaved hakea	Primary	Secondary	-	Saunders 1980; Groom 2011
Harpephyllum caffrum	Kaffir plum	-	-	Secondary	Johnstone 2017
Helianthus annuus	Sunflower	Secondary	-	-	Johnstone et al. 2010; Groom 2011
Hibiscus sp.	Hibiscus	Secondary	-	-	Groom 2011
Isopogon scabriusculus		Secondary	-	-	Groom 2011
Jacaranda mimosifolia	Jacaranda	Secondary	Secondary	-	Johnstone et al. 2010; Groom 2011
Jacksonia furcellata	Grey stinkwood	Secondary	-	-	Groom 2011
Kingia australis	Kingia	-	Secondary	-	Johnstone et al. 2010
Lambertia inermis	Chittick	Secondary	-	-	Johnstone & Storr 1998; Groom 2011
Lambertia multiflora	Many-flowered honeysuckle	Secondary	-	-	Saunders 1980; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Liquidamber styraciflua	Liquid amber	Primary	-	Secondary	Johnstone et al. 2010; Groom 2011; Groom 2014; Personal observation
Lupinus sp.	Lupin	Secondary	-	-	Saunders 1980; Groom 2011
Macadamia integrifolia	Macadamia	Primary	Secondary	-	Johnstone et al. 2010; Grooms 2011; Groom 2014
Malus domestica	Apple	Secondary	Secondary	-	Johnstone et al. 2010; Johnstone & Storr 1998; DSEWPaC 2012; DoEE 2017; Groom 2011
Melaleuca leuropoma		Secondary	-	-	Saunders 1980; Groom 2011
Melia azedarach	Cape lilac or white cedar	Secondary	-	Primary	Johnstone et al. 2010; Groom 2011
Mesomeleana spp.		Secondary	-	-	Johnstone et al. 2010; Groom 2011
Olea europea	Olive	-	-	Secondary	Johnstone 2017
Persoonia longifolia	Snottygobble	-	-	Secondary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017
Pinus canariensis	Canary island pine	Primary	-	-	Johnstone et al. 2010; Groom 2011
Pinus caribea	Caribbean pine	Primary	-	-	Johnstone et al. 2010; Groom 2011
Pinus pinaster	Pinaster or maritime pine	Primary	-	-	Groom 2011
Pinus radiata	Radiata pine	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011
Pinus spp.		Primary	Secondary	-	Johnstone & Storr 1998; Saunders 1979; Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017
Protea 'Pink Ice'		Secondary	-	-	Groom 2011
Protea repens		Secondary	-	-	Groom 2011
Protea spp.		Secondary	-	-	Johnstone et al. 2010
Prunus amygdalus	Almond tree	Secondary	-	-	Johnstone & Storr 1998; Johnstone et al. 2010; Groom 2011; DoEE 2017
Pyrus communis	European pear	-	Secondary	-	Johnstone & Storr 1998; Johnstone et al. 2010; DSEWPaC 2012; DoEE 2017
Quercus spp.	Oak	-	Secondary	-	Johnstone et al. 2010

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Raphanus raphanistrum	Wild radish	Secondary	-	-	Groom 2011; DoEE 2017
Reedia spathacea		-	Secondary	-	Johnstone et al. 2010
Rumex hypogaeus	Doublegee	Secondary	-	-	Saunders 1980
Stenocarpus sinuatus		Secondary	-	-	Johnstone et al. 2010
Syzygium smithii	Lilly pilly	Secondary	-	-	Groom 2014
Tipuana tipu	Tipu or rosewood tree	Primary	-	-	Groom 2011, Groom 2014
Xanthorrhoea preissii	Grass tree	Secondary	Secondary	-	Groom 2011; Johnstone et al. 2010
Xylomelum occidentale	Woody pear	Secondary	-	-	Groom 2014

CBC=Carnaby's black cockatoo, BBC=Baudin's black cockatoo and FRTBC=Forest red-tailed black cockatoo

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Appendix C

Black Cockatoo Habitat Tree Data

Black Cockatoo Habitat Tree Inventory
State Hockey Centre, Bentley

Tag No.	Easting	Northing	DBH (cm)	Species	Category	Notes
372	395345.98	6459065.42	50	*Corymbia calophylla*	No suitable hollow(s)	
475	395284.52	6459174.08	85	*Corymbia calophylla*	No suitable hollow(s)	
496	395268.03	6459120.80	81	*Eucalyptus rudis*	No suitable hollow(s)	
497	395264.29	6459120.16	79	*Eucalyptus rudis*	No suitable hollow(s)	
874	395261.88	6459136.37	65	*Eucalyptus rudis*	No suitable hollow(s)	