

## APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

<b>Type of development:</b>	Public Infrastructure
<b>Development Number:</b>	170/V002/19
<b>Applicant:</b>	Department of Planning, Transport and Infrastructure (Public Transport Projects Alliance)
<b>Nature of Development:</b>	Upgrade to Paradise Park'n'Ride comprising: a) Construction of a single deck car park; b) Alterations and additions to at-grade car parking; c) Reconfigured access and egress; d) Pedestrian and cycle access paths; cycle storage facilities; and landscaping; e) Removal of seven (7) Regulated trees; and f) Tree-damaging activities to one (1) Regulated tree and two (2) Significant trees.
<b>Subject Land:</b>	Lot 100 Darley Road, Paradise being Certificate of Title: Volume 5065, Folio 83
<b>Development Plan:</b>	Campbelltown Council Development Plan Consolidated 16 January 2018
<b>Zone / Policy Area:</b>	Suburban Activity Node Zone
<b>Contact Officer:</b>	Laura Kerber
<b>Phone Number:</b>	7109 7073
<b>Consultation Start Date:</b>	Wednesday 24 July 2019
<b>Consultation Close Date:</b>	Wednesday 21 August 2019
<p><b>During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders St, Adelaide, during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).</b></p>	

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered, or emailed to the State Commission Assessment Panel (SCAP). A representation form is provided as part of this document.

**Any representations received after the close date will not be considered.**

Postal Address:

The Secretary  
State Commission Assessment Panel  
GPO Box 1815  
ADELAIDE SA 5001

Street Address:

Development Division  
Department of Planning, Transport and Infrastructure  
Level 5, 50 Flinders Street  
ADELAIDE

Email Address: [scapreps@sa.gov.au](mailto:scapreps@sa.gov.au)

**DEVELOPMENT ACT, 1993  
S49/S49A – CROWN DEVELOPMENT  
REPRESENTATION ON APPLICATION**

**Applicant:** Department of Planning, Transport and Infrastructure (Public Transport Projects Alliance)

**Development Number:** 170/V002/19

**Nature of Development:** Upgrade to Paradise Park'n'Ride comprising: a) Construction of a single deck car park; b) Alterations and additions to at-grade car parking; c) Reconfigured access and egress; d) Pedestrian and cycle access paths; cycle storage facilities; and landscaping; e) Removal of seven (7) Regulated trees; and f) Tree-damaging activities to one (1) Regulated tree and two (2) Significant trees.

**Zone / Policy Area:** Suburban Activity Node Zone

**Subject Land:** Lot 100 Darley Road, Paradise being Certificate of Title: Volume 5065, Folio 83

**Contact Officer:** Laura Kerber

**Phone Number:** 7109 7073

**Close Date:** Wednesday 21 August 2019

My Name: \_\_\_\_\_ My phone number: \_\_\_\_\_

Primary method(s) of contact: \_\_\_\_\_ Email: \_\_\_\_\_  
Postal Address: \_\_\_\_\_ Postcode: \_\_\_\_\_

**You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.**

My interests are: ☐ owner of local property  
(please tick one) ☐ occupier of local property  
☐ a representative of a company/other organisation affected by the proposal  
☐ a private citizen

**The address of the property affected is:** \_\_\_\_\_  
Postcode \_\_\_\_\_

My interests are: ☐ I support the development  
(please tick one) ☐ I support the development with some concerns  
☐ I oppose the development

**The specific aspects of the application to which I make comment on are:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Return Address:** The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 /or  
**Email:** [scapadmin@sa.gov.au](mailto:scapadmin@sa.gov.au)

<b>I:</b>	<input type="checkbox"/>	wish to be heard in support of my submission
<i>(please tick one)</i>	<input type="checkbox"/>	do not wish to be heard in support of my submission <i>(Please tick one)</i>
<b>By:</b>	<input type="checkbox"/>	appearing personally
<i>(please tick one)</i>	<input type="checkbox"/>	being represented by the following person <i>(Please tick one)</i>

**Date:** \_\_\_\_\_



## DEVELOPMENT ACT 1993

### NOTICE OF APPLICATION FOR CONSENT TO DEVELOPMENT

#### SECTION 49 – PUBLIC INFRASTRUCTURE

Notice is hereby given that an application has been made by the **Department of Planning, Transport and Infrastructure** (Public Transport Projects Alliance) for consent to upgrade the Paradise Park'n'Ride. **Development Number: 170/V002/19.**

The proposed works will occur on the northern side of the Paradise O-Bahn Interchange and comprise: a) Construction of a single deck car park; b) Alterations and additions to at-grade car parking; c) Reconfigured access and egress; d) Pedestrian and cycle access paths; cycle storage facilities; and landscaping; e) Removal of seven (7) Regulated trees; and f) Tree-damaging activities to one (1) Regulated tree and two (2) Significant trees.

The subject land is situated at Lot 100 Darley Road, Paradise being Certificate of Title: Volume 5065, Folio 83.

The development site is located within the Suburban Activity Node Zone of the Campbelltown Council Development Plan Consolidated 16 January 2018.

The application may be examined during normal office hours at the office of the State Commission Assessment Panel (SCAP), Level 5, 50 Flinders Street and at the office of Campbelltown City Council (172 Montacute Rd, Rostrevor SA 5073). Application documentation may also be viewed on the SCAP website [http://www.saplanningcommission.sa.gov.au/scap/public\\_notices](http://www.saplanningcommission.sa.gov.au/scap/public_notices).

Any person or body who desires to do so may make representations concerning the application by notice in writing delivered to the Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide SA 5001 **NOT LATER THAN Wednesday 21 August 2019.**

Submissions may also be emailed to: [scapreps@sa.gov.au](mailto:scapreps@sa.gov.au).

Each person or body making a representation should state the reason for the representation and whether that person or body wishes to be given the opportunity to appear before the SCAP to further explain the representation.

Submissions may be made available for public inspection.

Should you wish to discuss the application and the public notification procedure please contact **Laura Kerber** on **7109 7073** or [Laura.Kerber@sa.gov.au](mailto:Laura.Kerber@sa.gov.au).

Alison Gill

**SECRETARY**

**STATE COMMISSION ASSESSMENT PANEL**

W71

[www.sa.gov.au](http://www.sa.gov.au)

W71

22x2 (63mm)

Adelaide Advertiser

North Messenger

Wednesday 24 July 2019



# SECTION 49 & 49A – CROWN DEVELOPMENT DEVELOPMENT APPLICATION FORM

## PLEASE USE BLOCK LETTERS

**COUNCIL:** Campbelltown City Council  
**APPLICANT:** Department of Planning, Transport and Infrastructure (DPTI)  
**ADDRESS:** GPO Box 1533 Adelaide SA 5001  
**CROWN AGENCY:** Department of Planning, Transport and Infrastructure (DPTI)

## FOR OFFICE USE

**DEVELOPMENT No:** \_\_\_\_\_  
**PREVIOUS DEVELOPMENT No:** \_\_\_\_\_  
**DATE RECEIVED:**        /        /

## CONTACT PERSON FOR FURTHER INFORMATION

**Name:** Ms Gemma Kernich  
**Telephone:** (08) 7109 7104 [work] 0401 124 287 [Ah]  
**Fax:** \_\_\_\_\_ [work] \_\_\_\_\_ [Ah]  
**Email:** gemma.kernich@sa.gov.au

## NOTE TO APPLICANTS:

(1) All sections of this form must be completed. The site of the development must be accurately identified and the nature of the proposal adequately described. If the expected development cost of this Section 49 or Section 49A application exceeds \$100,000 (excl. fit-out) or the development involves the division of land (with the creation of additional allotments) it will be subject to those fees as outlined in Item 1 of Schedule 6 of the *Development Regulations 2008*. Proposals over \$4 million (excl. fit-out) will be subject to public notification and advertising fees.  
 (2) Three copies of the application should also be provided.

- ☐ Complying  
☐ Merit  
☐ Public Notification  
☐ Referrals

**Decision:** \_\_\_\_\_  
**Type:** \_\_\_\_\_  
**Finalised:**        /        /

	Decision required	Fees	Receipt No	Date
Planning:	_____	_____	_____	_____
Land Division:	_____	_____	_____	_____
Additional:	_____	_____	_____	_____
<b>Minister's Approval</b>				

**EXISTING USE:** Paradise O-Bahn Park'n'Ride carpark and bus interchange

**DESCRIPTION OF PROPOSED DEVELOPMENT:** A reconfiguration and expansion of the existing car park on the northern side of the bus interchange. In addition to the reconfigured parking tree damaging activities, pedestrian and car park access upgrades, cycle storage and landscaping are also required.

## LOCATION OF PROPOSED DEVELOPMENT:

**House No:** \_\_\_\_\_ **Lot No:** 100 **Street:** Darley Road **Suburb:** Paradise **Section No [full/part]:** \_\_\_\_\_  
**Hundred:** Adelaide **Volume:** 3065 **Folio:** 83 **Section No [full/part]:** \_\_\_\_\_  
**Hundred:** \_\_\_\_\_ **Volume:** \_\_\_\_\_ **Folio:** \_\_\_\_\_ **LAND DIVISION:** \_\_\_\_\_  
**Site Area [m<sup>2</sup>]:** 67 900 **Project Area [m<sup>2</sup>]:** 12 500 **No of existing allotments:** \_\_\_\_\_  
**Number of additional allotments [excluding road and reserve]:** \_\_\_\_\_ **Lease:** YES ☐ NO ☐

**DEVELOPMENT COST [do not include any fit-out costs]:** \$ 15 500 000

**POWERLINE SETBACKS:** Pursuant to Schedule 5 (2a)(1) of the *Development Regulations 2008*, if this application is for a building it will be forwarded to the Office of the Technical Regulator for comment unless the applicant provides a declaration to confirm that the building meets the required setback distances from existing powerlines. The declaration form and further information on electricity infrastructure and clearance distances can be downloaded from the DPLG website ([www.dac.sa.gov.au](http://www.dac.sa.gov.au)).

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the *Development Act 1993*.

**SIGNATURE:** \_\_\_\_\_

**Dated:**        /        /



**PUBLIC TRANSPORT PROJECTS ALLIANCE**  
**PARADISE PARK'N'RIDE**

## **PLANNING REPORT**

# **Application for Roadwork and Tree Damaging Activities (including removal)**

**Doc No:** PTPA-APNR-110000-REP-0000-PLN-0001  
**Client:** The Department of Planning, Transport and Infrastructure (DPTI)  
**Program:** Public Transport Projects Alliance – PARADISE PARK'N'RIDE  
**Location:** Paradise O-Bahn Interchange Park'n'Ride, Paradise, 5075, South Australia  
**Project No:**  
**Revision:** A  
**Date:** 01 July 2019

### **Revision History**

<b>Rev</b>	<b>Date</b>	<b>Description</b>	<b>Prepared by</b>	<b>Reviewed by</b>	<b>Endorsed by</b>
A	01 July 2019	Issued to SCAP	Amber Smith	Brett Pendlebury	Adam Kilsby

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## 1. EXECUTIVE SUMMARY

Table 1.1 – Executive Summary

Executive Summary	
Proposal	Roadwork in the form of alterations and additions to existing carparking at the Paradise O-Bahn interchange (Northern side), including tree damaging activities, landscaping, retaining and service infrastructure provision and additions to bike storage facility.
Address	Lot 100 Darley Road, Paradise, SA, 5075
Hundred	Adelaide
Certificate of Title	CT Volume 5065 Folio 83 (portion of)
Owner	Commissioner of Highways (Government of South Australia)
Total Parcel size	Approximately 67,900m <sup>2</sup>
Project area size	Approximately 12,500m <sup>2</sup> (northern side of O-Bahn Busway only)
Local Government Authority	Campbelltown City Council
Planning Authority	Minister for Planning (Section 49 – Crown Development)
Planning Scheme	Development Plan – Campbelltown Council (Consolidated 16 January 2018)
Zone	Suburban Activity Node Zone
Existing Use	Car park and bus interchange
Proposed Land Use	Construction of single deck (deck) carpark and alterations and additions to at grade carparking, including landscaping, retaining and servicing.
Notification	Section 49 (7d) – 15 business days.
Applicant	Department of Planning, Transport and Infrastructure (DPTI)
Contact Person - DPTI	Gemma Kernich – DPTI – Unit Manager, Planning – Infrastructure Planning & Investment – Planning and Transport Policy - <a href="mailto:gemma.kernich@sa.gov.au">gemma.kernich@sa.gov.au</a> 08 7109 7104
Contact Person - PTPA	Brett Pendlebury – PTPA – Environmental & Approvals – <a href="mailto:brett.pendlebury@ptpa.com.au">brett.pendlebury@ptpa.com.au</a> , 08 7444 4793



## 2. THE APPLICANT

### 2.1. Applicant Details

The applicant for this project is:

**Department of Planning, Transport and Infrastructure (DPTI).**

77 Grenfell Street  
Adelaide SA 5000

Postal Address:  
GPO BOX 1533  
Adelaide SA 5001

### 2.2. Public Transport Projects Alliance

The applicant is supported by the Public Transport Projects Alliance (PTPA). The PTPA was formed by the Minister for Transport and Infrastructure. The PTPA Alliance team is underpinned by a legal agreement and is made up of the owner partner DPTI, and non-owner partners Arup, Mott McDonald and McConnell Dowell.

The South Australian Government is working with the PTPA to improve public transport by:

1. providing for improved access for all South Australian's by improving transport services and providing better connectivity between modes of transport and localities;
2. reducing travel times and enhance economic productivity of the workforce;
3. reducing South Australia's travel related carbon footprint; and
4. improving safety associated with rail crossings both for pedestrians and people in vehicles.

The PTP Alliance is responsible for a program of key public transport capital initiatives announced in the 2017-18 State Budget including:

- Oaklands Level-Crossing Removal
- Port Dock Railway Line
- O-Bahn Park'n'Ride Initiatives
- Rail-Sys Modelling
- North East Public Transport Study
- City South Tramline Replacement Project

Upgrading the carparking at the Paradise O-Bahn interchange Park'n'Ride is one of the O-Bahn Park'n'Ride Initiatives. To assist in planning for this initiative the PTPA has engaged the following specialist consultants:

- Holmes Dyer (planning);
- Gould Thorpe Planning Pty Ltd (stakeholder engagement);
- Rider Levett Bucknall (cost consultants);
- Golder Associates (geotechnical and contamination);
- Arborman (arborist);
- EBS (flora and fauna);
- Independent Heritage Consultants (Aboriginal and European heritage);
- COX Architecture (Architecture); and
- Aspect Studios (Landscape design).

### 3. PROJECT OVERVIEW

#### 3.1. The Paradise O-Bahn Interchange with Park'n'Ride

The Paradise O-Bahn Interchange, one of three along the alignment, opened in March 1986 and is located in between the Klemzig and Tea Tree Plaza (Modbury) interchanges in the suburb of Paradise.

The Paradise Interchange is located approximately 9km north east of the Adelaide CBD on the western side of Darley Road between Gameau Road in the north and Lincoln Road / Walker Avenue in the south.

The 67,900 m<sup>2</sup> land parcel extends around 650 m from its north-east to its south-west extent, and about 200 m at its widest north-west/south-east extent. The site is relatively flat, except for the batters created for Darley Road (over) and the busway (under) at the north-eastern end of the site. The site includes an open grassed area, vegetated primarily with eucalypts planted when the original carpark and bus interchange was constructed in 1986. The majority of the site is paved bitumen providing all weather car parking for commuters, as well as access for pedestrians and buses.

The site is bound by Darley Road to the east beyond which there is mainly low scale low density housing constructed in the 1960's with some recent intensification of dwelling densities occurring through the area. There are also some non-residential uses including recreation/open space, emergency services depot, child care centre and church. To the north, the site abuts Gameau Road. North of Gameau Road is residential development of generally low and low/medium densities. To the west of the site there are low density residential properties.

The O-Bahn busway divides the interchange site into northern and southern sections.

Currently the existing at-grade off-street Park'n'Ride parking provision for both at both the northern and southern side of the Paradise Interchange totals 468 spaces. The northern carpark (P1), the site of the upgrade currently has provision for 60 parks whilst the southern carpark, south of the O-Bahn busway has provision for 408 parks (Refer Section 3.4 *Existing Carpark*).

#### 3.2. The O-Bahn Busway

The Adelaide O-Bahn (also known as the North Eastern busway) was constructed in response to significant population growth occurring at that time in the north eastern suburbs which were not served by the metropolitan rail nor a freeway system. At the time the area was developing to a distance of approximately 23 kilometres from the CBD, with a large proportion of the population working in the city.

The 12km Adelaide O-Bahn is a high frequency high speed bus service which runs between Adelaide CBD, Klemzig, Paradise and Tea Tree Plaza and in the suburbs beyond these interchanges. The Adelaide O-Bahn buses travel on-road in the CBD and along Hackney Road before travelling in guided mode along the dedicated high-speed tracks between Mann Road, Gilberton and the Tea Tree Plaza Interchange at Modbury (Tea Tree Plaza). On-road buses access the O-Bahn corridor at the Klemzig, Paradise and Tea Tree Plaza Interchanges, refer to Figure 3.1 below for visual aid.

Construction for the first stage was completed in 1986 and second stage was completed in 1989.





Figure 3.1: O-Barn corridor at the Klemzig, Paradise and Tea Tree Plaza Interchanges.

### 3.3. North East Public Transport Study

The PTP Alliance conducted the North East Public Transport Study (NEPTS), with the aim of identifying opportunities to improve the accessibility and patronage of public transport in the north-eastern metropolitan areas, including the use of the O-Bahn busway. The area of the study is shown in the figures below.

The NEPTS provides a holistic review of the public transport opportunities for the north eastern suburbs including investigation of:

- options to enhance O-Bahn services to Golden Grove;
- priorities for increased Park'n'Ride facilities; and
- opportunities to improve travel times, reliability and access.

The future profile of O-Bahn Park'n'Ride demand was assessed using existing arrival data (MetroCard) and strategic modelling (DPTI's MASTEM tool). Under future forecasts, demand for parking at the three O-Bahn Interchanges (Klemzig, Paradise and Tea Tree Plaza) outstrips existing supply.

The initial analysis of the future profile of O-Bahn Park'n'Ride demand also identified the following:

- Paradise Interchange is located in a non-walkable car-oriented suburb. It also has sparse high frequency bus network services. This results in patchy patronage and reliance on Park'n'Ride facilities – Refer to Figure 3.2 below.
- Paradise Interchange also serves a wide catchment for Park'n'Ride users – refer to Figure 3.3.
- Results for Paradise Interchange were in contrast to sites such as the Klemzig Interchange which is located in a denser network of high frequency routes, plus being walkable with mixed-use suburbs. This results in comparatively accessible public transport and well patronised corridors – Refer to Figure 3.4.

In addition:

- No recent parking investment has occurred at the Paradise Interchange (Klemzig and Tea Tree Plaza had parking upgrades in 2013 and 2014 respectively).

- High demands for parking at Paradise have resulted in on-street parking on the adjacent Darley Road and ongoing demand for parking on land owned by the Influencers Church to the east of Darley Road. Ongoing use of the land for carparking is not guaranteed. In addition, the site is informal with no lighting, paving and poor pedestrian connectivity to the interchange.

The finding of NEPTS identified that an upgrade (ie, increase parking provisions) of the Paradise Park'n'Ride is a higher priority than carparking upgrades for the Klemzig and Tea Tree Plaza Park'n'Rides.

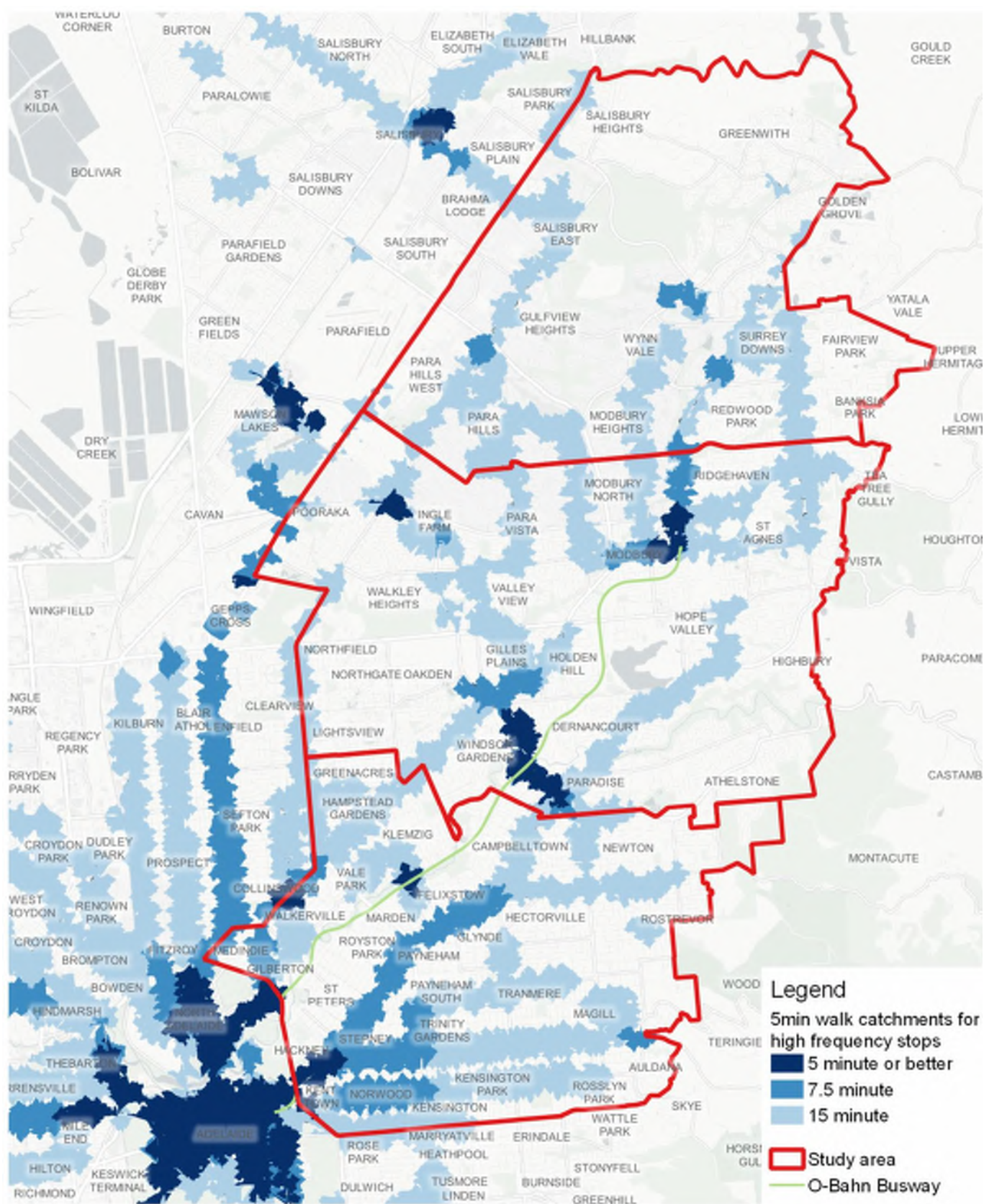


Figure 3.2: Walking catchment to high frequency service (NEPTS February 2019)



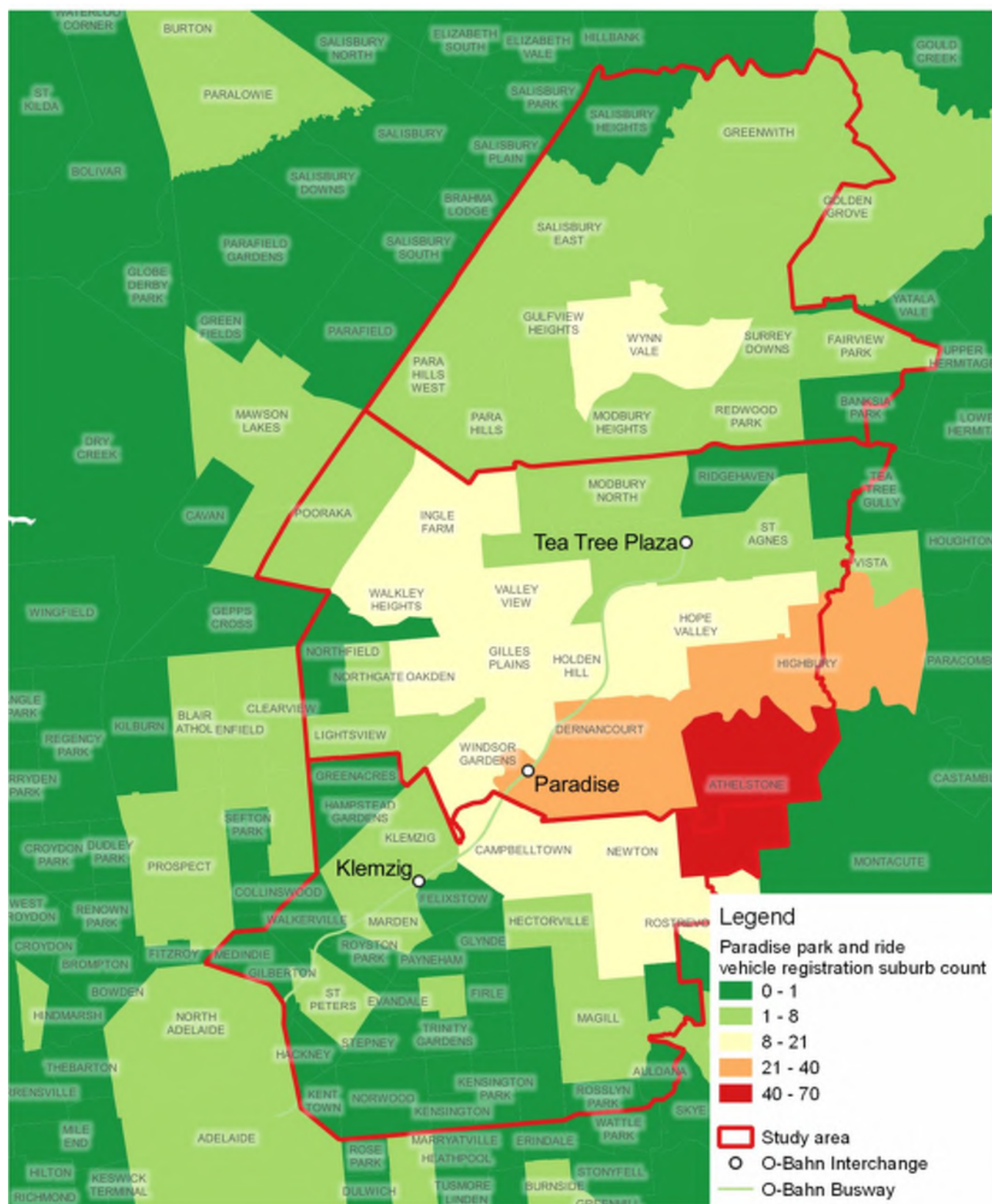
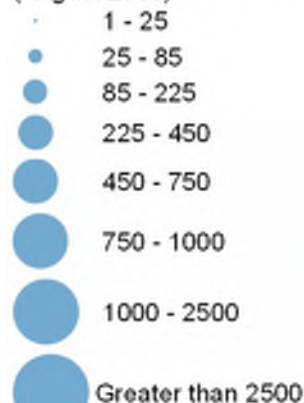


Figure 3.3: Paradise Park'n'Ride journey origin area (NEPTS February 2019)



## Legend

Average weekday boardings  
(August 2018)



O-Bahn Busway  
Study area

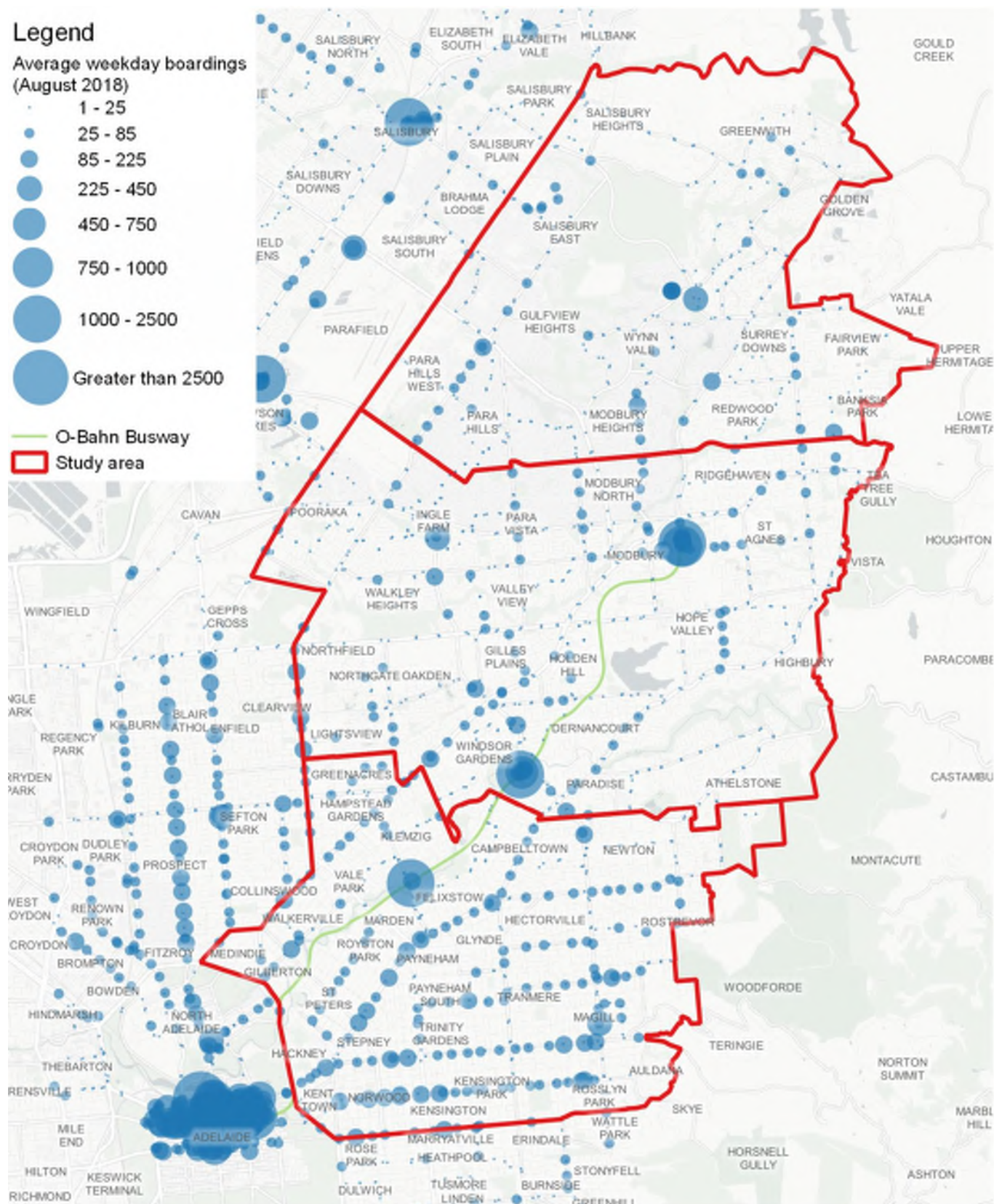


Figure 3.4: Weekday Boardings (NEPTS February 2019)

### 3.4. Project Property Details

**Table 3.1: Paradise Park'n'Ride property details**

Property details	
Address	Lot 100 Darley Road, Paradise, SA, 5075
Hundred	Adelaide
Certificate of Title	CT Volume 5065 Folio 83 (portion of)
Plan Parcel	D32043 A100
Notations on Title:	Service easement in favour of Council (drainage). Small portion of the site has a right of way over land external to the site.
Total parcel size	Approximately 67,900m <sup>2</sup>
Project area size (subject site)	Approximately 12,500m <sup>2</sup> (northern side of O-Bahn Busway only)
Owner	Commissioner of Highways (Government of South Australia)
Local Government Authority	Campbelltown City Council
Planning Authority	Minister for Planning (Section 49 – Crown Development)
Planning Scheme	Development Plan – Campbelltown City Council (Consolidated 16 January 2018)
Zone	Suburban Activity Node Zone
Existing Use	At grade car park, bus interchange, open space.
Proposed Use	Alterations and addition to existing carpark at the Paradise O-Bahn interchange (northern side) including single deck carparking, reconfigured access and egress, pedestrian and cycling paths, cycle facilities, landscaping and tree damaging activities.

A copy of the Certificate of Title is included as Attachment 1.





Figure 3.5: Paradise Park 'n' Ride interchange extent with project area highlighted in red

### 3.5. Existing Carpark

Currently the total carpark capacity at the Paradise O-Bahn Interchange is 468 spaces, divided by the O-Bahn Busway into the northern and southern sections.

#### Northern section

The northern section is the site subject to the upgrade project.

The northern section Park'n'Ride capacity at the Paradise Interchange comprises of:

**Table 3.2: Existing Northern Park'n'Ride parking spaces per area**

Car Park Area	Parking Spaces	Location and access
P1	60	Northern side of interchange, access from Gameau Road
<b>TOTAL</b>	<b>60 spaces</b>	

The existing 60 parking spaces in P1 include four (4) DDA compliant spaces and no provision for motorcycles. The number excludes the existing 10 space provision for Kiss'n'Drop along the existing interchange frontage.

Carpark area P1 is accessed from Gameau Road. Gameau Road has a signalised intersection with Darley Road. Buses access (in) and egress (out) to the Paradise Interchange are from Gameau Road with layover and interchanging buses capacity currently located on the section of the interchange to the north of the O Bahn track.

#### Southern section

The Southern section of the site is not subject to the project. Existing conditions will remain.

The southern section Park'n'Ride capacity at the Paradise Interchange comprises of:

**Table 3.3: Existing Southern Park'n'Ride parking spaces per area**

Car Park Area	Parking Spaces	Location and access
P2 and P3	97 spaces	Southern side of interchange, access from Lincoln Road
P4	95 spaces	Southern side of interchange, access from Lincoln Road
P5 and P6	166 spaces	Southern side of interchange, access from Lincoln Road
P7	40 spaces	Southern side of interchange, access from Lincoln Road
<b>TOTAL</b>	<b>408 spaces</b>	

Carpark area P2 to P7 is accessed from Lincoln Road. Lincoln Road does not have a signalised intersection with Darley Road.



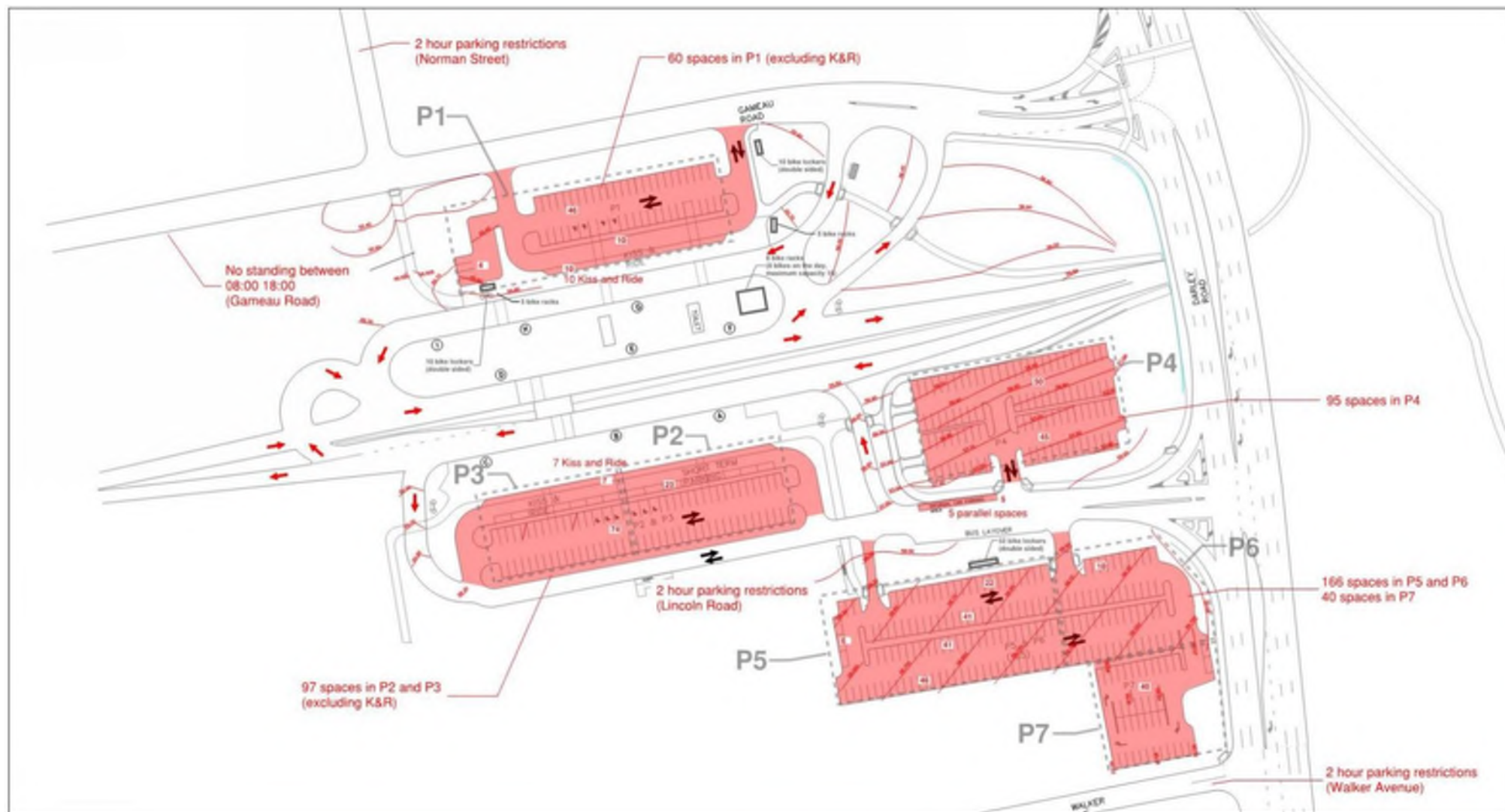


Figure 3.6: Paradise O-Bahn Interchange – Existing Park'n'Ride Provision



Figure 3.7 – Gameau Road junction of Norman Ave, viewing east.



Figure 3.9 – View east from near western boundary of existing northern carpark.



Figure 3.8 – View east from near western boundary of existing northern carpark.



Figure 3.10 – View west from near eastern boundary of existing northern carpark. Bus access to interchange in foreground.





Figure 3.11 – View west from near eastern boundary of existing northern carpark.



Figure 3.13 – View west from bus exit from interchange adjacent to Gameau Road.



Figure 3.12 – View west from bus exit from interchange adjacent to Gameau Road.



Figure 3.14: Area between bus out and bus in roads, view north from Paradise Interchange.





Figure 3.15: At grade carpark site view west from Darley Road.



Figure 3.17: At grade carpark site, view to east along shared use path adjacent busway.



Figure 3.16: At grade carpark site, bus out road view to Darley Road.



Figure 3.18: At grade carpark site, view to south from Gameau Road along Darley Road.

### 3.6. Project Summary

The project aims to increase the total parking space capacity at the Paradise O-Bahn interchange Park'n'Ride, with the primary aim of increasing the patronage of O-Bahn services.

This will be achieved by increasing capacity to the carpark on the northern side of the Interchange / O-Bahn Busway by constructing a single deck carpark over the existing short-term carpark site on Gameau Road and constructing an at grade carpark on the eastern portion of the site to increase available parking spaces for public transport users.

Carparking on the southern side of the busway will not be changed as part of this project.

The project consists of:

- Additional car parks
- Reconfigured access and egress
- Pedestrian and cycling access paths
- Cycle facilities
- Landscaping
- Tree damaging activities

## 4. PROJECT CONTEXT

### 4.1. Planning Frameworks

#### 4.1.1. 30-Year Plan for Greater Adelaide

The 30 Year Plan for Greater Adelaide is the high-level strategy that sets out the planning priorities for the State. This is not statutory but should be reflected within the Development Plans.

The plan has three key objectives:

1. Maintain and improve liveability
2. Increase competitiveness
3. Drive sustainability and resilience to climate change

To summarise, the 30-Year Plan seeks the revitalisation of existing neighbourhoods, concentrated new development around transit corridors, and new mixed-use precincts which will allow jobs, services and public transport to be closer to existing and new residential areas.

These Objectives are supported by 14 Principles and 6 Targets. The principles and targets relevant to this project are set out in Table 4.1 below.

**Table 4.1: 30 Year Plan for Greater Adelaide**

30 Year Plan Reference	How the project contributes
Key Principle 3 - Accessibility	This project will assist in accessibility to a node for transport mode change and access to reliable O-Bahn Bus services for the north eastern suburbs of Adelaide.
Key Principle 4 – A transit focussed and connected city	This project is part of DPTI's programme of public transport improvements that will underpin a transit focussed and connected city.
Key Principle 8 - Healthy, safe and connected communities	This project connects car users, pedestrians and cyclists with busses, enhancing connectivity for residents in the area.
Key Principle 10 – Economic Growth and competitiveness	This project will enhance access to the O-Bahn, part of the public transport system which is beneficial to supporting the economy.
Key Principle – 11 – Climate change resilience	By providing reliable alternative modes of mass transport, vehicle emissions should be reduced.
Target – More way to get around <i>60% of all new housing in metropolitan Adelaide will be built within close proximity to current and proposed fixed line transport and high frequency bus routes.</i>	This upgrade will enable greater transport capacity and will be able to underpin additional residential development in proximity to the Interchange.
Target – Getting Active <i>Increase share of work trips made by active transport modes by residents of inner, middle and outer Adelaide by 2045.</i>	This carpark with bicycle storage facilities will encourage the use of cycling as a primary mode of transport for a portion of a journey.

#### 4.1.2. Integrated Transport and Land Use Plan

The Integrated Transport and Land Use Plan contains the following vision.

- Our vision is that South Australia is globally competitive, vibrant and connected. We focus our efforts on building on South Australia's strengths – advanced manufacturing and defence, mining and resources, premium food and wine, tourism, liveability and a unique environment.
- Adelaide is recognised as one of the world's most liveable cities and a great place to live and work – with strong and cohesive communities, successful industries and a growing services sector.
- In a fiercely competitive global economy, boosting and continually improving Adelaide's liveability is a critical economic strategy for South Australia's long-term prosperity.

- Adelaide's liveability is built on a more compact city with a high-quality transport system, healthy and safe communities and a strong commitment to environmental sustainability.

The Plan includes a number of initiatives. In relation to Greater Adelaide these are:

- An increasing focus on major urban centres and accessibility to these centres – building upon the electrification of the north-south backbone of the public transport system, a modernised and redesigned bus network with a focus on major activity centres and supporting a more active city through better connected walking and cycling networks and walkable environments.
- Giving businesses the efficient, reliable transport connections they need to deliver goods and services around the city and to interstate and international markets – a well-targeted package of investment in the North-South Corridor, Inner and Outer Ring Routes and intersection and road upgrades.

This project is consistent with and will specifically support both initiatives by:

- Improving the Paradise Park'n'Ride facility and northern section of the Paradise O-Bahn interchange.
- Providing an enhanced safer environment for commuters, pedestrians, and cyclists.
- Constructing facilities to support a modernised and redesigned bus network.
- Facilitating a more efficient access to the O-Bahn network.

#### 4.1.3. Campbelltown City Council – Towards 2020

Campbelltown City Council Strategic Plan 2010-2020 (revised 15 November 2016) has a 10-year outlook which identifies the Council's Vision, Mission, Values, Goals, Objectives and Strategies.

In 2009/2010 Council prepared a new Strategic Plan for the City in consultation with the Community. The Plan responded to Community needs and was prepared with consideration of change, giving consideration to the economic, social and environmental sustainability pressures faced at the time. Council conducted a review of its Strategic Plan in 2015/2016 to ensure that the Plan is still relevant and updated for the changing circumstances that are affecting their local Community. Council's vision of '*Campbelltown provides a quality lifestyle for its people*' continues to reflect the key aspirations of Council and the Community, and is underpinned by the following goals:

- Quality Living
- Leadership
- City Planning
- Environmental Responsibility
- Local Economy.

The upgrade of the carparking of at the Paradise O-Bahn interchange Park'n'Ride contributes to the following Campbelltown City Council goals:

**Table 4.2: Campbelltown City Council goals**

Goal	Objective
<b>1 - Quality Living</b> A quality lifestyle that meets the changing needs of the community.	1.3 City infrastructure that provides a range of welcoming, attractive and safe facilities that encourage social interaction and an active community. 1.4 Strong partnerships and effective management of resources to achieve mutual benefits for the community.
<b>3 - City Planning</b> Planning that achieves a balance between infrastructure, development, and community needs.	3.2 Effective Infrastructure and Asset Management that allows for growth 3.3 Planning aligned to local needs and State Plans.



#### 4.1.4. Campbelltown City Council Development Plan

Holmes Dyer Pty Ltd has undertaken a review of planning provisions relevant to CT Volume 5065 Folio 83 for the PTP Alliance in accordance with the Campbelltown City Council Development Plan. This review by Holmes Dyer can be found in Section 8.

## 4.2. DPTI and PTP Alliance Strategic and Operational Outcomes Framework

### 4.2.1. Project Objectives

Project objectives identify the project elements and define what each element of a project should achieve. The objectives for PTP Alliance O-Bahn Park'n'Ride Initiatives are to:

- increase the number of Park'n'Ride spaces available for passengers at O-Bahn Interchanges; and
- improve passenger accessibility at O-Bahn Interchanges.

### 4.2.2. Project Outcomes

Project Outcomes define what the project should achieve – the result the project aims to achieve within the project constraints.

The project specific outcomes for the consider passenger access and accessibility, integrated transport, passenger information, safety and conveniences, bus and traffic operations, urban renewal and development, minimising land acquisition, integrated transitions from the interchange, enhancing and maintaining the character of the Paradise interchange, minimising disruptions to traffic conditions and protecting the safety of the public. This project aims to uphold these outcomes by incorporating ODASA's Principles of Good Design into the design of the project.

Further information regarding project outcomes that the Paradise Park'n'Ride carpark upgrade seeks, refer to Attachment 3.

### 4.2.3. Project Principles

The project specific principles are to consider passenger access and accessibility, connectivity and wayfinding, improved connectivity with integrated accessible infrastructure, creating an inviting and safe public realm that is welcoming to all, and equitable access for all.

Further information regarding project principles that the Paradise Park'n'Ride carpark upgrade seeks, refer to Attachment 3.

### 4.2.4. Construction Management Outcomes

The construction management outcomes for the project consider resilience of the infrastructure, creation of a facility that is readily maintainable, a maximized operational life, materials that can be integrated into existing conditions with an enduring finish, integration of environmentally sustainable principles to minimise short-term and long-term impacts, inclusion of green infrastructure, self-sustaining landscaping, locally sourced materials, delivery quality infrastructure, integrated transport infrastructure and land-use solution that aligns with the 30-year plan for greater Adelaide, enabling future development and anticipated transport changes, effective inter-modal connections for all commuter types to public transport, enhanced amenity, passenger comfort and convenience, and reliable road and public travel. For more information on these construction management outcomes refer to Attachment 3.



### 4.3. The Office for Design and Architecture South Australia (ODASA)

#### 4.3.1. ODASA's Role

The Office for Design and Architecture South Australia (ODASA) supports the role of the Government Architect in promoting the value of good design. ODASA:

- Embeds design quality in government and planning policy.
- Shapes and influences significant construction projects.
- Promotes the role of good design in contributing to healthy neighbourhoods.
- Supports design innovation and the integration of smart and sustainable technologies.

#### 4.3.2. ODASA's Principles of Good Design

ODASA's Principles of Good Design focus on how buildings and places can meet the needs of the people who use them. For the best practise principles, refer to Table 4.3 below that demonstrates the South Australian Government's commitment to achieving design excellence in the built environment.

**Table 4.3: ODASA best practice principles**

Principle	Explanation	Project evidence
Context	Good design is contextual because it responds to the surrounding environment and contributes to the existing quality and future character of a place.	<p>The project has retained existing significant and regulated mature trees that currently contribute to the existing character of the site.</p> <p>Upgraded pedestrian and cycle infrastructure improve connectivity to the surrounding neighbourhood.</p> <p>Attention has been paid to the aesthetics of the new built structure, with quality detailing and finishes that will contribute to a positive character of the site.</p> <p>Green buffers between adjacent properties and streets, and green walls also contribute positively to the character of the site while visually screening the car park.</p>
Inclusive	Good design is inclusive and universal because it creates places for everyone to use and enjoy, by optimising social opportunity and equitable access.	DDA compliant access to the interchange is improved with upgrades to paths, pram ramps and enhanced pedestrian crossings.
Durable	Good design is durable because it creates buildings and places that are fit-for-purpose, adaptable and long-lasting.	Landscape materials are enduring and robust, including pedestrian and vehicular grade pavements, concrete retaining walls, anodised aluminium mesh balustrades and building cladding, and stainless-steel bike racks.
Value	Good design adds value by creating desirable places that promote community and local investment, as well as enhancing social and cultural value.	The bus interchange promotes and improves access to sustainable public transport, enhancing the liveability and attractiveness of the neighbourhood.
Performance	Good design performs well because it realises the project potential for the benefit of all users and the broader community.	As a vehicular 'Park 'n' Ride' facility with improved pedestrian and cycle connections, the project benefits broad user groups wanting to access enhanced public transport infrastructure.
Sustainable	Good design is sustainable because it is environmentally responsible and supports long-term economic productivity, health and wellbeing.	53 semi-advanced trees and over 8000 new low-maintenance, indigenous groundcover plants will be installed as part

Principle	Explanation	Project evidence
		<p>of this project, improving amenity and providing benefits to biodiversity.</p> <p>Public safety has been improved by adhering to CPTED principles and maintaining clear sightlines across the site and at intersections, providing multiple access points, and upgraded lighting and security measures.</p>

#### 4.3.3. Design review by the ODASA

ODASA Design Review is an independent evaluation process facilitated by ODASA in which a panel of built environment experts reviews the design quality of development proposals. The Design Review Program is led by the South Australian Government Architect and/or staff from the Office for Design and Architecture SA (ODASA), within the Department for Planning, Transport and Infrastructure (DPTI).

The Paradise Park'n'Ride upgrade was considered by the Design Review panel after an earlier site inspection at their first Desktop Review session on 7 February 2019. Feedback from the ODASA Chair was received by the project on 18 February 2019. Both the feedback and the outcome are summarised in Table 4.4 below.

**Table 4.4: ODASA design review feedback and outcome summary**

ODASA feedback	Outcome
<i>Preference for the deck carpark to be at the north eastern corner of the site would mitigate impacts to the adjoining residential area and existing landscape, though acknowledged this option is not being pursued for financial reasons resulting from height and construction costs in addition to traffic movements relative to the Darley Road intersection.</i>	<i>The option was considered and is discussed in Section 5 'Project Background and Options Analysis'.</i>
<i>Supporting the approach to maintain the existing bus route into and out of the interchange with some minor adjustments to alignment noting it mitigates impacts of bus circulation on the adjoining area. Review of site conditions to retain the large and potentially significant trees. Exploration of opportunities to improve the amenity of this space through seating was identified.</i>	<i>PTPA Site Review and Tree Analysis workshop was been undertaken by the project team on Friday 5 April 2019. Carpark design modified. Alternate seating opportunities have been investigated and included in the design.</i>
<i>Pedestrian movement and safety was identified as being critical to supporting walkability and connectivity with the wider community. An expansion of the existing pedestrian movements was recommended to capture the range of user groups using the interchange throughout the day. Application of a disability access overlay was recommended to ensure safe and equitable access for the pedestrian, cycle, bus and car movements at ground level.</i>	<i>Further formal pedestrian movements investigations were undertaken. A project team Paradise Interchange multi user access workshop on Thursday 11 April 2019 was undertaken discuss equitable and safe access for all user groups with a focus of ensuring flow and movements are safe.</i>
<i>The formal footpath around carparks with a filtration model for pedestrian egress under the carpark ramp and through carparks warrants further consideration of safe and convenient pedestrian circulation is required</i>	<i>This feedback was considered and now included in the current design</i>
<i>Gaps between carparks and visual markers to reinforce desire lines. Calming measures and pedestrian zones to mitigate pedestrian and bus conflicts supported.</i>	<i>This feedback was considered and now included in the current design</i>
<i>The absence of a Kiss and Drop was noted, and inclusion in the design was recommended.</i>	<i>Inclusion of Kiss 'n' Drop has been reconsidered. Provision for 12 Kiss 'n' Drop spaces immediately</i>

	<i>adjacent to the interchange in the at grade carpark, sheltered, below the single deck has been included.</i>
<i>A recommendation of a vehicle circulation overlay be applied to the carpark design to ensure safe and convenient movements are achieved</i>	<i>This feedback was considered, and the outcome is reflected in the current design</i>
<i>The enhancement of the area available for secure cycle parking was identified with an anticipation of ongoing consideration of convenient and safe bicycle access, storage and parking as the design developed</i>	<i>This feedback was considered and included in the current design. Initial cycle storage facility site relocated to more convenient, safer and secure location.</i>
<i>Further review of the stair configuration, including direct access from the footpath to maximise convenience be considered</i>	<i>This review was undertaken. Stairs reconfigured at right angles to both carpark (onto raised kerb) and interchange to improve safety. Direct access to footpath in line with existing crossings to the interchange crossing was not implemented in favour of offset alignment to seek to maximise safety.</i>
<i>Suggestion for a duplication of the expanded mesh cladding and graphic on the main structure at Darley Road intersection to assist with wayfinding.</i>	<i>Expanded mesh cladding was integrated into fence element around the retaining wall near Darley Road to connect the entire site with similar design intent, assisting wayfinding along the way as well.</i>
<i>Opportunity to further explore the layout, geometry, texture, profile and colour of the mesh to break down the horizontal linear geometry and length of screening along Gameau Road.</i>	<i>Gameau Road elevation was further refined, and an interesting pattern emerged, allowing play between the retaining wall and cladding above to articulate the landscape while providing functional barrier and permeable cladding to achieve open car park standards.</i>
<i>Design of the stair elements are considered to be inconsistent with the overall expression recommending further review to define the stair portals and provide visual cues for wayfinding.</i>	<i>Feedback has been considered and incorporated.</i>
<i>Headlight glare and light spill have potential to significantly impact on the amenity of neighboring residences and an integrated solution to mitigate the issue is recommended</i>	<i>This feedback has been considered and incorporated into design. Documented as part of the project impact assessment see Section 7.7 Headlight Nuisance.</i>
<i>Recommendation for testing of lighting in day and night time conditions, and that an after hours lighting strategy be confirmed.</i>	<i>Design measures have been incorporated to minimise disruption to neighbours. Included as part of project impact assessment, Section 7.6 Light spill.</i>
<i>Recommendation that the design and structural system allows for future integration of shade structures.</i>	<i>The design does not preclude future integration of shade structures at the at grade carpark.</i>
<i>Urging retention of as much of the sites existing landscaping to be retained upon installation of the retaining wall on the [southern / carpark side] existing mound with established trees and shrubs.</i>	<i>PTPA site review and tree analysis workshop occurred to maximise tree retention. An on-site inspection with the projects independent qualified arborist was undertaken. The trees that are not impacted and can remain is reflected in the current design and landscape plan.</i>
<i>Replication of the existing layering of trees and shrubs in the landscape plan.</i>	<i>This is reflected in the current design and landscape plan / planting palette</i>
<i>The condition of the existing Gameau Road footpath is less than optimal, urging further review of a potential upgrade to provide a safe and equitable path.</i>	<i>The majority of the City of Campbelltown footpath will be upgraded in the current design.</i>
<i>For the proposed north eastern carpark, the minimization of retaining wall height is supported. Inclusion of shade trees and further consideration of WSUD principles including diversion, stormwater re use and the inclusion of permeable paving.</i>	<i>Strategy to minimise the retaining wall height visually was implemented, making it into a green wall, allowing non-intrusive plants/vine to grow upwards and eventually cover the retaining wall completely. Further consideration of WSUD has been undertaken and incorporated into the eastern carpark. Refer Section 7.9 Water, Section 7.9.3 'Operational impact and mitigation'</i>
<i>Acknowledgement that wayfinding does not form part of the project scope, but reaffirms the project presents a significant opportunity to become an identifiable landmark</i>	<i>Feedback has been considered and incorporated into project. Innovative way finding has been included in the form of sight lines, retaining desire lines, fencing and landscaping.</i>

## 5. PROJECT BACKGROUND AND OPTIONS ANALYSIS

### 5.1. Concept Options Development

Having reviewed the previous studies of the Paradise Interchange, the PTP Alliance developed seven concept options for the upgrade of the Paradise Park'n'Ride. Each concept was developed considering strategic context and project constraints in addition to other site-specific factors.

The seven concept options ranged in size, scale and placement. A summary of the location, the type of structure and the project footprint of each concept option is summarised in Table 5.1 below.

For the location of each of the seven concept options considered, refer to Figure 5.1 below.

For a summary of each concept option with relative advantages and disadvantages refer to Table 5.2.

**Table 5.1: Details of each concept design**

Option	Location	Type of structure	Footprint
1	Directly south of the existing interchange	Multi-deck (3 levels)	5,200 m <sup>2</sup>
2	North-east of the Existing interchange	Multi-deck (4 levels) <i>and</i> at grade	2,730 m <sup>2</sup> (Multi deck), 890 m <sup>2</sup> (at grade)
3	North and north-east of the interchange	Single-deck with deck (2 levels) <i>and</i> at grade	4,050 m <sup>2</sup> (Multi-deck), 6,255 m <sup>2</sup> (at grade)
4	North of the interchange	Multi-deck (3 levels)	4,970 m <sup>2</sup>
5	Paradise Interchange	Single deck over all O-Bahn Busway interchange (Liberal Govt. pre-election concept)	13,410 m <sup>2</sup>
6	East of the interchange (over the O-Bahn track) adjacent Darley Road	Single deck over O-Bahn track	8,270 m <sup>2</sup>
7	Council owned site on eastern side of Darley Road	Multi-deck (3 levels)	6,500 m <sup>2</sup>

### 5.2. Concept Option Analysis

A multi-criteria analysis (MCA) was undertaken for the upgrade of carparking at the Paradise O-Bahn interchange Park for Options 1-7 using criteria documented criteria in the DPTI Project Scope and Technical Requirements (PS&TR).

Option 3, which relates to a design solution with a combination of at-grade parking with a single deck on the north interchange parcel was rated as the preferred option from the MCA.





Figure 5.1: Site options explored for the Paradise Park'n'Ride carpark upgrade

**Table 5.2: Advantages and disadvantages for each option assessed**

Option	Location	Multi Criteria Analysis score (Out of 14)	Type of structure	Advantages	Disadvantages
1	Directly south of the existing interchange	<b>9</b>	Multi-deck (3 levels)	<ul style="list-style-type: none"> <li>Constructability - does not disrupt existing bus movements and could generally be constructed without significant impact to the operating interchange.</li> </ul>	<ul style="list-style-type: none"> <li>Higher costs associated with anticipated signalised intersection upgrade at Lincoln Road (as investigated DPTI/SMEC in 2017).</li> <li>Entire solution relies on a multi-deck component.</li> <li>100 existing at-grade spaces which would need to be demolished and re-built.</li> <li>To reduce potential visibility and amenity constraints of a multi-deck facility, design may need to be split/broken-up to reduce impacts.</li> </ul>
2	North-east of the Existing interchange	<b>5</b>	Multi-deck (4 levels) and at grade	<ul style="list-style-type: none"> <li>Makes use of existing external road network infrastructure for access (existing traffic signals at Darley Road / Gameau Road).</li> </ul>	<ul style="list-style-type: none"> <li>Requires bus road re-alignment.</li> <li>The existing vacant land was considered less favourable due to retaining this for future development opportunities.</li> </ul>
3	North and north-east of the interchange	<b>14</b>	Single-deck (2 levels) and at grade	<ul style="list-style-type: none"> <li>Makes use of existing external road network infrastructure for access (existing traffic signals)</li> <li>Aligns best to the DPTI project scope and technical requirements (and MCA).</li> <li>It can be staged (deliver at-grade car parking, prior to the multi-deck component).</li> <li>Reduced cost.</li> </ul>	<ul style="list-style-type: none"> <li>Potential bus road re-alignment.</li> </ul>
4	North of the interchange	<b>11</b>	Multi-deck (3 levels)	<ul style="list-style-type: none"> <li>Makes use of existing external road network infrastructure for access (existing traffic signals)</li> </ul>	<ul style="list-style-type: none"> <li>Potential bus road re-alignment.</li> </ul>
5	Paradise Interchange	<b>8</b>	Single deck over all O-Bahn interchange (Liberal Govt. pre-election concept)	<ul style="list-style-type: none"> <li>Would result in completely new interchange and waiting area for passengers.</li> </ul>	<ul style="list-style-type: none"> <li>Highest cost associated with enabling works during construction (impact to operating interchange).</li> <li>Difficult to construct due to enabling works (longer timeframe).</li> </ul>
6	East of the interchange (over the O-Bahn track) adjacent Darley Road	<b>-2</b>	Single deck over O-Bahn track	<ul style="list-style-type: none"> <li>Would result in completely new interchange and waiting area for passengers.</li> </ul>	<ul style="list-style-type: none"> <li>Higher cost associated with enabling works during construction (impact to operating interchange).</li> <li>Difficult to construct (enabling works, longer time).</li> <li>Comparatively less car park yield for budget.</li> </ul>
7	Council site east side of Darley Road	<b>6</b>	Multi-deck (3 levels)	<ul style="list-style-type: none"> <li>Constructability - away from operating interchange.</li> </ul>	<ul style="list-style-type: none"> <li>Costs and time associated with land acquisition.</li> <li>Zoned as Metropolitan Open Space.</li> </ul>



## 6. PROJECT DETAIL

### 6.1. The project

The project aims to increase the total parking space capacity at the Paradise O-Bahn interchange Park'n'Ride.

This will be achieved by increasing capacity to the northern side of the O-Bahn Busway by constructing a decked carpark over the existing short-term carpark site on Gameau Road and construction of an at grade carpark on the eastern portion of the site to enable a total capacity of 447 parking spaces. Refer to Table 6.1 below. Parking capacity on the southern side of the busway will not change.

The PTP Alliance has developed a design for the proposed upgrade of Park'n'Ride facilities at the Paradise Interchange as part of the O-Bahn Park'n'Ride Initiatives Project.

The O-Bahn Park'n'Ride Initiatives Project has been undertaken in parallel with Phase 2 of the North East Public Transport Study (NEPTS), part of the South Australian Government's commitment to invest significantly in a stronger public transport network by delivering increased connectivity, faster and more reliable travel and increased public transport use.

### 6.2. Project components

The project consists of:

- Additional car parks
- Reconfigured access and egress
- Pedestrian and cycling access paths
- Cycle facilities
- Landscaping
- Tree damaging activities

#### 6.2.1. Additional car parks

The Paradise Park'n'Ride upgrade will result in provision of 447 parking spaces on the northern side of the interchange (up from the current 60 parking spaces plus 10 space Kiss'N'Drop), comprising of:

- A single-deck parking structure over the existing Gameau Road at-grade car park site comprising a total of 306 parking spaces (151 spaces on ground level and 155 spaces on the deck level), and
- An additional at-grade car park on the vacant land on the corner of Gameau Road and Darley Road, comprising 141 parking spaces.

Parking provisions are summarised in Table 6.1 below and the concept carpark design is shown in Figure 6.1, with more detail in Figures 6.2, 6.3 and architectural renderings in Figures 6.4, 6.5 and 6.6 below.

**Table 6.1: Parking spaces – Norther side**

Parking provisions	Number
Long stay spaces	398
Long stay DDA compliant spaces	9
Short stay (Kiss'n'Drop)	12
Motorcycles	28
<b>Total</b>	<b>447</b>
Cycles	36



Figure 6.1: Context landscape plan for the proposed Paradise Park 'n' Ride.



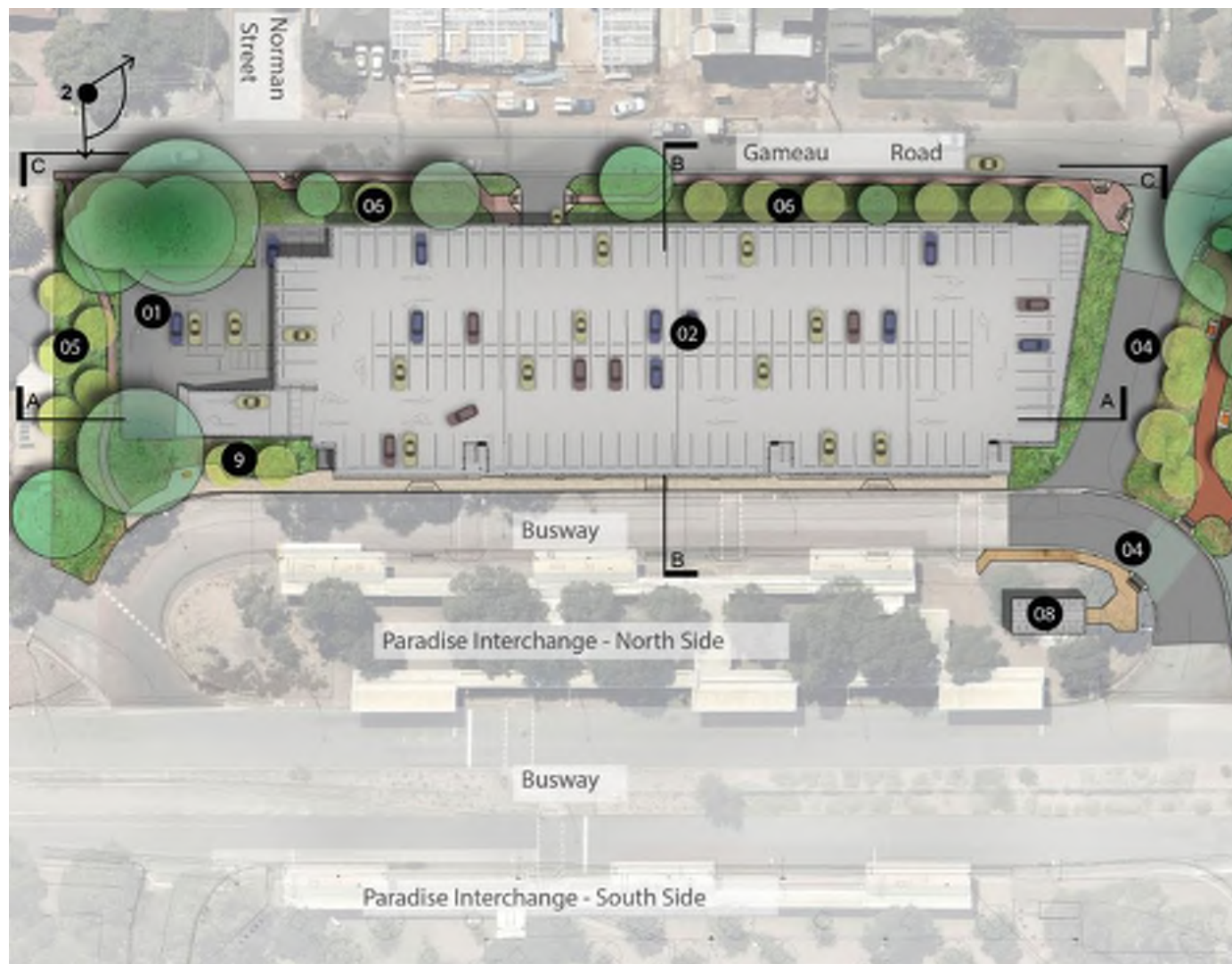


Figure 6.2: Site concept plan, single deck car park at the site of the existing carpark on Gameau Road.



Figure 6.3: Site concept plan, at grade carpark and bus in/out, eastern end near Darley Road.





Figure 6.4: Render of the Paradise Park 'n' Ride carpark site at maturity, view south from Gameau Road.





Figure 6.5: Render showing close up of eastern at grade carpark of the Paradise Park and Ride at maturity view to the south east from Gameau Rd.





Figure 6.6: Render showing close up of the western end of Paradise Park'n'Ride at maturity, v view south east from Gameau Rd.

To achieve parking capacity of 306 spaces the upgrade of the western carpark (including the single deck structure) will extend beyond the existing footprint partially into the southern side of the vegetated embankment along Gameau Road. To retain the embankment fronting Gameau Road for amenity planting and minimise headlight nuisance to neighbours, a retaining wall up to 2m high (with drainage) will be installed parallel to the single deck carpark extent on the carpark side. The works will also include upgraded lighting, electrical, stormwater, landscaping and a formal path around the carpark perimeter with a pedestrian egress to the bus interchange retained on the southern side of the carpark. Closed circuit TV (CCTV) and provision for electric car charging will be installed. The existing carpark exit will be upgraded to become the combined vehicle access (in) and egress (out) to the carpark.

The ramp to access the single level deck parking will be located at the western end of the carpark. Portals for three stair cases on the southern side will align adjacent to the three existing pedestrian crossings of the bus interchange. The deck of the western carpark will be enclosed with a safety barrier behind expanded mesh cladding fixed to a sub frame grid.

At the eastern section of the site construction of a new at grade carpark is proposed. The site is bordered by Gameau and Darley Roads, the shared use path / O-Bahn Busway and bus interchange exit road. A 141-space capacity carpark with access (in) and egress (out) to Gameau Road from the location where the buses currently egress (out) to Gameau Road. To accommodate the sloping topography a retaining wall of up to 3.2m on the northern boundary, with fencing adjacent to the kerbside footpath is required.

### **6.2.2 Reconfigured access and egress**

To accommodate the additional parking the alignment of the access (in) and egress (out) bus roads between Gameau Road and the bus interchange will be revised with both being relocated approximately 40m to the west of their current location.

The new bus access (in) to the interchange will be in proximity to where the existing western carpark entry is located. Provision for short term laydown parking for up to two buses has also been included in the design.

The new bus egress (out) has been aligned to join Gameau Road opposite Inwood Avenue.

These is the only change to the public transport access, with no change to the O-Bahn platform and passenger facilities south of the existing carpark required.

Access and egress for the western carpark will be from the existing access and egress point located opposite 19C Gameau Road.

Access and egress for the eastern carpark will be in immediate proximity to where the existing bus egress meets Gameau Road.

### **6.2.3 Pedestrian and cycling access paths**

Access for pedestrians and cyclists is maintained and safety enhanced by provision of:

- a designated pathway along the western end of western carpark linking Gameau Road near Norman Street to the northern side of the bus interchange.
- a pedestrian connection linking the bus interchange to the car park structure past pedestrian stairs and to Gameau Road. The pedestrian connections into the deck car park align adjacent to the existing pedestrian crossings locations to the centre platform of the interchange.
- a pathway with pedestrian barrier alongside the eastern end of the single-deck carpark.
- a revised shared pathway alignment through the centre of the bus in and out roads with a revised, safer crossing location to access the eastern end of the bus interchange near the cycle storage facility.
- an upgrade to sections of the footpath along Gameau Road frontage providing connection to Darley Road in the east (with pedestrian barrier on Gameau Road frontage of the eastern carpark).
- to maximise safety, avoid path duplication and increase space for amenity planting no path will be provided alongside the eastern end of the single deck carpark, adjacent to the bus entry road.
- maintain the existing path alignment along the northern edge of the O-Bahn corridor with an upgrade at the western end to a safer crossing location to access the bus interchange and existing cycle storage facility.



#### 6.2.4. Cycle storage facilities

To enable the parking upgrade on the northern side of the interchange to be undertaken some of the existing cycle storage facilities require removal and updated cycle storage facilities provided.

The existing bike storage boxes and bicycle hoops located on the southern and eastern edge of the existing western carpark will require removal.

To reinstate capacity the existing cycle storage cage at the interchange will be extended to enable storage for a minimum of 32 bicycles. The site also offers space for future expansion if required.

In addition to the cycle storage cage a new small-scale 'node' with capacity for 4 bicycle parks and a bench seat is located at the south-west corner of the western carpark where the pedestrian link from Gameau Road (near Norman Street) to the bus interchange will be provided. Refer to the proposed and existing cycling infrastructure plan in Figure 6.7 below.



Figure 6.7: New and existing bicycle storage site plan

#### 6.2.5. Landscaping

Three key strategies underpin the landscape design solution for the Paradise Interchange upgrade:

1. Providing safe and convenient pedestrian/ cyclist links.
2. Providing revegetation that is low maintenance, drought tolerant and in keeping with the character of the local area to minimise the visual impacts of the new works.
3. Improving wayfinding throughout the site extents for enhanced legibility and public safety. The plans also propose to retain as much of the existing vegetation as possible. To facilitate this the design team has worked closely with the Arborist and Environmental Advisors to undertake tree inspections, workshops, design changes and plan adjustment. Engagement with the architectural and engineering design team as well as ODASA and Council representatives has informed the design approach.

### 6.2.6. Tree damaging activity

An Arboriculture assessment was initially undertaken in February 2019 and updated in May 2019 (Attachment 2).

A total of 127 trees were assessed. Nine (9) were identified as Regulated Trees, three (3) were identified as Significant in accordance with provisions of the *Development Act 1993*. The remaining 115 were identified as unregulated trees.

This assessment identified:

- There are 115 unregulated trees which are not subject to consideration of tree damaging activity in accordance with provisions of the *Development Act 1993*.
- Trees R7 and R17 are Regulated Trees with a low retention rating indicating that design constraint, alternative designs or tree friendly construction methodologies are not warranted.
- There are nine trees which are Regulated and/or Significant Trees with a moderate retention rating indicating they should be considered for retention.
- Trees R50 is a Regulated Tree with a High Retention Rating indicating it should be considered for retention.

The 12 Significant and Regulated trees located in the project area are summarised in Table 6.2 below. Table 6.3 details the design process undertaken to retain the trees and provide additional parking capacity.

**Table 6.2: Significant and Regulated trees on site.**

Tree Identification Number	Botanical name	Common Name	Origin	Number of Trees
S2, R7, R11, S127	<i>Eucalyptus leucoxylon</i>	South Australian Blue Gum	Indigenous	4
R17, R33, R58	<i>Eucalyptus cladocalyx</i>	Sugar Gum	Native	3
S28, R50	<i>Eucalyptus camaldulensis</i>	River Red Gum	Indigenous	2
R44	<i>Corimbula citriodora</i>	Lemon Scented Gum	Native	1
R101, R122	<i>Corimbula maculata</i>	Spotted Gum	Native	2
				<b>Total (12)</b>

Refer to Figure 6.8 below for each significant and regulated tree location relative to the carpark footprint.

The project seeks approval to:

- Remove 6 Regulated trees (tree numbers R7, R17, R33, R44, R101, R122) due to an Arborist recommendation to mitigate safety hazards or being located either immediately adjacent the single deck carpark structure or directly beneath the footprint where there is a significant impact to the tree protection zone (for more detail refer to Table 6.3 below).
- Remove an additional Regulated tree (tree number R11) due to the full extent of the cumulative impact of root damage and surface elevation difference impact will not be known until construction commences. The species has a low tolerance to disturbance. The project seeks approval to remove this tree but will continue to pursue retention of the tree into construction and to operation (refer to Table 6.4)
- Tree damaging activities in the form of minor canopy and root impacts to 1 Regulated (R58) and 1 Regulated Significant (S28). Tree R58 may require removal of one lower branch for vehicle clearance under the new single deck ramp and potentially minor root impacts at a portion of the outer extent of the tree protection zone. Tree S28 may also require removal of one lower branch for heavy vehicle clearance on Gameau Road and potentially minor root impacts at a portion of the outer extent of the tree protection zone to enable construction of the bus in road. (Refer to Table 6.4).
- Tree damaging activities in the form of minor root impacts to the southern outer extent of the tree protection zone of 1 Regulated Significant tree (S127) to enable construction of the western carpark.



Figure 6.8: The location of Significant and Regulated trees relative to Paradise Park 'n' Ride project footprint.

Figure 6.9(A) – Figure 6.9(J) below show images of all significant and regulated trees taken at the Paradise Interchange site.





Figure 6.9(A): Tree number R2



Figure 6.9(C): Tree number R11



Figure 6.9(B): Tree number R7



Figure 6.9(D): Tree number R17





Figure 6.9(E): Tree number S28

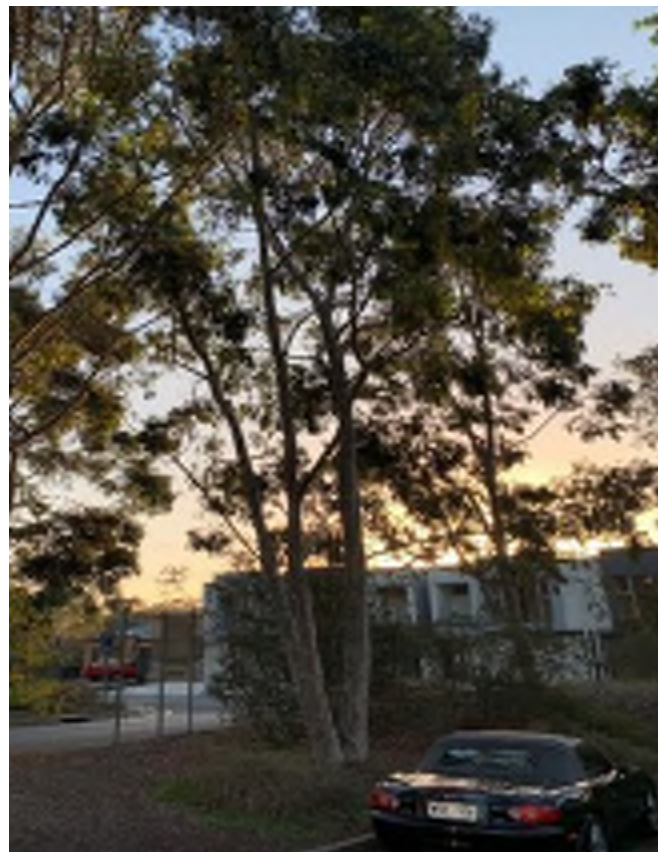


Figure 6.9(G): Tree number R44



Figure 6.9(F): Tree number R33



Figure 6.9(H): No. R50 (rear) and S127 (front)





Figure 6.9(I): R58



Figure 6.9(K): R122



Figure 6.9(J): R101



Notwithstanding Schedule 14(4)(b)(vii)(B) of the *Development Regulations 2008*, the project has been designed to minimise impacts on significant and regulated trees, with the design process that incorporated this summarised in the Table 6.3 below.

**Table 6.3: Design process of Paradise Park 'n' Ride to minimise tree impacts.**

Project Stage	Comments	Number of Trees to Remove	Removal Percentage	Number of Trees to Retain	Retention Percentage
<b>Arborist Assessment:</b> Design initiation phase involved engaging a qualified Arborist for assessment of each tree including tree health and safety risk.	A few trees recommended for removal by Arborist (tree numbers R7 and R17) due to poor tree structure and safety risk.	2/12	17%	10/12	83%
<b>Preliminary design issue:</b> Carpark footprint versus tree survey.	The preliminary carpark design was found to impact most of the trees (tree numbers R7, R11, R17, S28, R33, R44, R50, R58, R101, R122).	11/12	92%	1/12	8.33%
<b>Preliminary design review with project team leads:</b> Site Review and Tree Analysis workshop was undertaken by the project team on Friday 5th of April 2019. Carpark design modified with specific intention to minimise tree impacts.	<p>Review to determine which trees could be incorporated in design. Outcome at the time was that around half may be retained pending further engineering assessment and arborist review.</p> <p>As a project team, decisions were made to:</p> <ul style="list-style-type: none"> <li>• Forgo up to 4 carparks for retention of tree number R11.</li> <li>• Major redesign of bus in/out route to go around tree number S28. This would shift bus in/out westwards and require significant civil redesign to both carparks including the single deck structure.</li> <li>• Forgo up to 4 carparks for retention of tree number R50 and S127.</li> <li>• Forgo 2 carparks for retention of tree number R58.</li> <li>• Retainment sought for tree number R122 pending detailed arborist assessment due to single deck structure and retaining wall potentially causing cumulative impacts.</li> </ul>	7/12	58%	5/12	42%

	<ul style="list-style-type: none"> <li>Unregulated trees were also reviewed during the design review to understand impacts to unregulated trees.</li> </ul>				
<b>Further Arborist Engagement:</b> On-site inspection with project team and independent arborist to verify project impacts on each tree.	Arborist on-site review undertaken with all 12 trees assessed with revised design. Impacts to the root zone of R122 deemed too severe to retain. Potential risk to tree root impacts to tree R11 associated with revised site levels identified.	6/12	50%	6/12	50%
<b>Final design issue and review</b>	<p>Upon multiple design reviews and alterations optimised design to minimise impacts to trees enabling for 6 of the 12 trees to be retained (tree numbers S2, R11, S28, R50, R58, S127).</p> <p>The final design minimises impacts to trees by the means of:</p> <ul style="list-style-type: none"> <li>Foregoing approximately 9 carparks on the West end of the Park 'n' Ride to retain tree number R50, R58, S127 (including civil services etc. to work around trees).</li> <li>Forgoing approximately 3 carparks on the East end of the Park 'n' Ride to retain tree number R11 by constructing around the Tree Protection Zone.</li> <li>Redesigned bus in/out route to not encroach on tree number S28.</li> </ul>	6/12	50%	6/12	50%

After numerous design iterations and advice from a consultant arborist, the final design enables 6/12 Significant and Regulated trees to be retained as part of the Paradise Park 'n' Ride project.

In addition, the PTPA requires approval from the Department of Planning Transport and Infrastructure (DPTI) for tree damaging activities (removal) for unregulated trees. Refer to Section 7.4 Flora and Fauna, subsection 7.4.2 construction impacts and mitigation.

For further information regarding offsets for tree damaging activities in accordance with the *Development Act 1993*, and unregulated amenity tree removal offsets in accordance with requirements of the DPTI Vegetation Removal Policy, refer to Section 7.4.2 *Construction impacts and mitigation*.

Refer to Table 6.4 below for the Significant and Regulated trees requiring removal approval.

**Table 6.4: Regulated and Significant tree damaging activities requiring approval.**

Tree No.	Species	Regulation Status	TPZ	Retention Rating	Structure	Health	Requirement	Development Impact Comments
<b>S2</b>	<i>Eucalyptus Leucoxylon</i>	Significant	5.48 metres	Moderate	Fair	Fair	RETAIN	No impact.
<b>R7</b>	<i>Eucalyptus Leucoxylon</i>	Regulated	5.94 metres	Low	Poor	Fair	REMOVE	Removal sought: Extensive decay in the primary structure is present. Tree removal is recommended by arborist.
<b>R11</b>	<i>Eucalyptus Leucoxylon</i>	Regulated	8.76 metres	Moderate	Good	Good	REMOVE*	*Every effort has been made to retain this tree in design. The full extent of the cumulative impact of root damage and surface elevation differences will not be known until construction commences. The species has a low tolerance to disturbance. Given the uncertainty approval to remove sought but the PTPA will continue to retain the tree during construction.
<b>R17</b>	<i>Eucalyptus Cladocalyx</i>	Regulated	7.68 metres	Low	Poor	Fair	REMOVE	Removal sought: Extensive decay in the primary structure and tree removal is recommended by arborist.
<b>S28</b>	<i>Eucalyptus Camaldulensis</i>	Significant	13.80 metres	Moderate	Fair	Good	RETAIN	Minor impact. Potential removal of one lower (minor) branch for heavy vehicle clearance on Gameau Road. Potentially minor root impacts at a portion of the outer extent of the tree protection zone to enable construction of the bus in road.
<b>R33</b>	<i>Eucalyptus Cladocalyx</i>	Regulated	5.44 metres	Moderate	Fair	Good	REMOVE	Removal sought: Location immediately adjacent the single deck carpark structure.
<b>R44</b>	<i>Corimbula Citriodora</i>	Regulated	5.58 metres	Moderate	Fair	Good	REMOVE	Removal sought: Beneath footprint of the single deck carpark.
<b>R50</b>	<i>Eucalyptus Camaldulensis</i>	Regulated	10.80 metres	High	Good	Good	RETAIN	No impact.
<b>R58</b>	<i>Eucalyptus Cladocalyx</i>	Regulated	8.64 metres	Moderate	Fair	Fair	RETAIN	Minor impact. Potential removal of one lower (minor) branch for vehicle clearance and impact to roots at a portion of the outer edge of tree protection zone.
<b>R101</b>	<i>Corimbula Maculata</i>	Regulated	7.92 metres	Moderate	Good	Good	REMOVE	Removal sought: Beneath footprint of the single deck carpark.
<b>R122</b>	<i>Corimbula Maculata</i>	Regulated	8.62 metres	Moderate	Fair	Good	REMOVE	Removal sought: Location immediately adjacent the single deck carpark structure.
<b>S127</b>	<i>Eucalyptus Leucoxylon</i>	Significant	15.00 metres	Moderate	Fair	Fair	RETAIN	Minor impact. Potential impact to roots at a portion of the outer edge of tree protection zone at the southern side of tree.



## 6.3. Project delivery

### 6.3.1. Construction timelines

Subject to stakeholder consultation and approvals construction is currently scheduled to commence in late 2019. Subject to the construction commencement date parking is currently anticipated to be available for commuters on the northern side of the interchange from mid-2020.

### 6.3.2. Construction Environmental Management Plan

The Paradise Construction Environmental Management Plan (CEMP) will provide the framework for identifying environmental aspects and impacts associated with the works and for managing the environmental controls and processes implemented by Alliance personnel, sub-contractors and consultants when undertaking their respective responsibilities in relation to the Project.

The CEMP is used to assist in:

- Achieving the Alliances' stated environmental objectives and targets .
- Meeting legal and contractual compliance.
- Outlining procedures for the management of environmental protection issues relevant to the activities being performed.

The CEMP will be prepared in accord with relevant guidelines and legislation, along with the requirements as listed in the Project Scope and Technical Requirements (PS&TR), including

- Compliance with the approach to management of the Environmental Protection issues referred to within the documents listed in CH50.
- Compliance to issues identified in Part D20 "Design- Environmental".
- Comply with Environmental Protection Issues in the same order as they appear in Part CH50 "Environmental Management Systems" and Part G50 "Environmental Protection Issues" or the DPTI environmental Code of Practice for Construction.
- Demonstrate how the environmental and sustainability objectives will be incorporated into all aspects of the works.

The Paradise CEMP will include the following subplans:

- Construction, Noise and Vibration Management Plan
- Identification of the contractor activity zones
- Identification of Tree protection zones
- Soil Erosion and Drainage Management Plan
- Air quality (dust)

## 6.4. Project urban design principles

The PTP Alliance has engaged the professional services of COX Architecture and Aspect Studios to assist with architectural and landscape design for all the projects within the PTPA Alliance Program.

To guide the architectural and landscape design outcomes for the broader O-Bahn Park'n'Ride Program the following urban design principles were identified:

- Park'n'Ride capacity increase
- Enhance the O-Bahn network
- Transport connectivity
- User safety and amenity
- Direct and indirect property value uplift

For the Paradise Park'n'Ride project principles extended to include the following:

- Functional, durable and low-cost materials.
- Screening requirements.
- Scale and massing commensurate with adjacent two storey development.
- Permeable and open design where possible to maintain ease of access for pedestrians and cyclists.
- Shaded pathways and complementary landscaping creating a buffer to surrounding neighbourhood.
- Efficient geometry and layout of car parking spaces and columns.
- Signage and wayfinding to be consistent with O-Bahn branding.
- Retain the existing Interchange platform / canopy / passenger amenities infrastructure.

The design approach has been applied to the following elements:

- Upgrade of existing and new car parking facilities.
- Car parking architecture that is considerate of the surrounding residential area.
- High quality pedestrian and cyclist paths with clear and legible access to the Interchange.
- Provision for additional cycle storage facilities.
- Planting including extensive semi-advanced trees to provide shade and understory buffer planting.
- Furniture, including seating.
- Retaining walls, barriers & fencing.
- Contrasting pavement thresholds within the roadway at pedestrian crossovers.

With a focus on:

### ***Connected Communities***

The upgraded Paradise O-Bahn Interchange Park 'n' Ride shall improve passenger access to the north side of the O-Bahn Interchange, through upgraded car parking facilities and improvements to pedestrian and cyclist access to the Interchange. The design aims to provide a safe, accessible and comfortable public realm consisting of well-designed infrastructure that increases public transport patronage and supports connectivity within the interchange precinct and surrounding destinations.

### ***Pedestrian and Cyclist Movement***

The project encourages active healthy lifestyles by promoting sustainable forms of transport, including enhanced pedestrian access, cycle infrastructure and public transport. The urban design and landscape enhance and improve the connectivity and safety of pedestrian and cyclist routes within the project scope and broader strategic links. Pathways connect from the bus interchange to surrounding areas including from Gameau & Darley Roads, and are designed to be convenient and practical, providing direct connections from the broader precincts to and from the interchange.

Where there are potential conflicts between pedestrians and buses, landscape treatments have been proposed with the aim to increase the safety of the pedestrian. This includes:

- Alignment of paths and crossovers at bus exit and entry roads have been designed to provide the greatest visibility achievable to ensure clear sightlines are maintained.
- Distances between pram ramp crossovers have been minimized where possible.
- Contrasting paving thresholds have been proposed in the roadway to passively influence bus driver behaviour to take caution at pedestrian crossovers.

All paths consider best practice Crime Prevention Through Environmental Design (CPTED) principles and will have new lighting to enhance the public realm and improve public safety. Footpaths utilise quality surface materials and define clear and legible entries and exits to the bus interchange. Pedestrian movement through the carpark is also marked and legible, with people encouraged through open spaces near the stairwells and connecting conveniently to pram ramp crossovers at the interchange. Capacity to increase the existing cycle enclosure is proposed and will be centrally located for convenience and security, with a direct connection to the existing shared-use-path.

### ***Landscape Treatments***

Although trees are to be removed to make way for the new Park'n'Ride facility, 29 existing mature trees have been retained where possible. Trees that are required to be removed will be replaced with approximately 53 semi-advanced trees. Refer to Figure 6.10 below for the context landscape plan for the site. This includes new shade trees to open car parking, and amenity trees to landscaped areas. Many new trees will be native species and will provide habitat for native fauna. New trees will be clear-trunked and maintain clear sightlines across the site for pedestrian safety and site wayfinding. Understorey planting will be native low-growing species that are also low-maintenance.



**Figure 6.10: Context landscape plan for the proposed Paradise Park 'n' Ride.**

In the upgraded open carpark at the east of the site, Water Sensitive Urban Design (WSUD) infrastructure will be implemented. Rain gardens between rows of car parking will capture stormwater runoff, passively irrigating the vegetation and filtering car park run off prior to entering the detention tank and treatment system prior to entering the stormwater network.

The public realm infrastructure, including furniture, paths and lighting will be high quality and visually attractive, utilising robust and long-lasting materials that are fit for purpose.

### ***Sustainable Design***

Sustainable design principles have been incorporated such as improved stormwater management, energy efficiency LED lighting, and new tree and groundcover plantings for biodiversity. The urban and landscape design is coordinated and integrated with architecture and civil infrastructure and utility services so as to complement the structure integrity, functionality and accessibility.

## 6.5. Community and Stakeholder Engagement

In addition to the statutory consultation, Gould Thorpe Planning has been engaged by the PTP Alliance to undertake consultation with all identified key stakeholders in accordance with program wide PTPA Communications and Stakeholder Relations Management Plan. Planning the delivery of stakeholder and community engagement activities across the PTPA Program provides a consistent and efficient approach by ensuring the following are identified:

- Project-specific goals and messages.
- Project-specific stakeholder profile.
- Project-specific Issues Management Strategy.
- Targeted Action Plan.

The Paradise O-Bahn Park'n'Ride project has the following specific community and engagement goals:

- Understanding and respecting the history of the O-Bahn and the development of the Park'n'Ride facility.
- Consulting stakeholders and the community about the concept plans, respecting that there is some level of awareness about the project already and that stakeholders and the community would have an expectation of input into the outcome.
- Involving the City of Campbelltown in the project's development.

The Paradise Park'n'Ride stakeholder profile is summarised in Table 6.5 below.

Consultation with the City of Campbelltown to date includes briefing the Chief Executive Officer and General Manager Infrastructure Services and the PTP Alliance design team in October 2018, February 2019 and May 2019. In addition, the elected members received a full project briefing in June 2019. The briefings provided an overview of the Paradise Park'n'Ride project, updates on the design as it progressed and feedback from Council on design and sustainability considerations. Feedback on the design options from Council staff has been positive with recognition of the PTP Alliance team's efforts to increase total available parking while maintaining the amenity of the site and minimise visual impacts for adjacent residents.

**Table 6.5: Stakeholder profile – Paradise O-Bahn Park'n'Ride**

Stakeholder Group	Stakeholder Name	Interest	Main communication Method(s)
Local council	Campbelltown City Council	Planning and design review Community outcomes Local road network impacts	Briefings Letters Notifications
State Member of Parliament	SA Member for Hartley the Hon Vincent Tarzia MP	Community outcomes	Briefings Letters Notifications
Federal Member of Parliament	Federal Member for Sturt the Hon James Stevens MP	Community outcomes	Briefings Letters Notifications
Affected residents, and land owners	Multiple	General interest in project including milestones and tracking Environmental impacts (tree removals) Traffic and access changes Disruptions to O-Bahn services Construction impacts including noise, dust and vibration Pedestrian access	Notifications Website Email Door knocking
Pedestrians	O-Bahn users	Safety	Emails



	Shared Use Path users Residents crossing O-Bahn Busway	Disruptions to O-Bahn services	Notifications Signs Posters
Cyclists and cycling groups	Individual cyclists Local bicycle user groups	Safety Access changes and detours Traffic disruptions	Briefings Emails Notifications
O-Bahn public transport users	Local residents	Disruptions to services Safety Access to stops and stations	Signs Posters Emails Notifications

Council staff stated their preference for the site to be future-proofed to enable more car parking to be easily constructed in the future to further reduce the demand for on-street car parking.

Consultation with residents near the Park'n'Ride to date has included the distribution of notifications relating to early site investigations and door knocking of households immediately adjacent to the proposed site for the new car park. A wider consultation program commenced mid-May 2019 with distribution of a project newsletter (showing concept designs) and an extensive door knock of the surrounding areas. Initial informal feedback from residents on the possibility of increased car parking being constructed on the site was positive. Responses also included comments and concerns beyond the project site regarding existing traffic conditions and existing parking on Darley Road. The existing traffic volumes on Gameau Road, the use of the Kiss'n'Drop and traffic frequency of vehicles circling around Gameau Road/ Norman Road/ Woodmere Avenue and Inwood Avenue were identified by residents. Some residents expressed concern about the potential loss of trees from the Park 'n' Ride site resulting in a change to existing amenity, shading and screening.

Communication and engagement activities will continue as the project progresses.

## 7. IMPACT ASSESSMENT

### 7.1. Pedestrian and cycling movement

#### 7.1.1. Existing conditions

Existing pedestrian and cycling movements were identified whilst recording data during the traffic assessment, by undertaking observations during site visits (Refer to Figures 7.1 and 7.2) and reviewing the Strava Global Heatmap data for running and cycling as shown in Figure 7.3 (a) and (b).

Pedestrians and cyclists currently access the northern section of the Paradise O-Bahn Interchange from:

- The north / north west at the western end of the existing carpark (refer to Figure 7.5) from the residential dwellings in Paradise (between Gameau Road/Victor Road northwards to the Torrens River Linear Park corridor).
- The north east from the suburb of Windsor Gardens (likely from cars parked along Darley Road), through the area proposed for the new eastern carpark and the section between the bus in and out roads (refer to Figure 7.6).
- The east from the suburbs of Windsor Gardens and Dernancourt, via the shared use path immediately adjacent to the busway under Darley Road and over the Torrens River Linear Park corridor (refer to Figures 7.7 and 7.8).
- The southern side of the interchange (the southern carpark) to access the O-Bahn bus services to Tea Tree Plaza.
- Gameau Road, through the interchange to the Torrens Linear Park corridor. The Strava Global Heat Map data suggest cyclists regularly pass through the interchange and under the Darley Road bridge.

There is no evidence indicating pedestrians and cyclists use the eastern side of what will be the new at grade carpark between the Gameau Road signalised crossing and the Darley Road underpass, likely due to a more direct access to the Torrens Liner Trail across the signalised intersection/ Darley Road to the east.

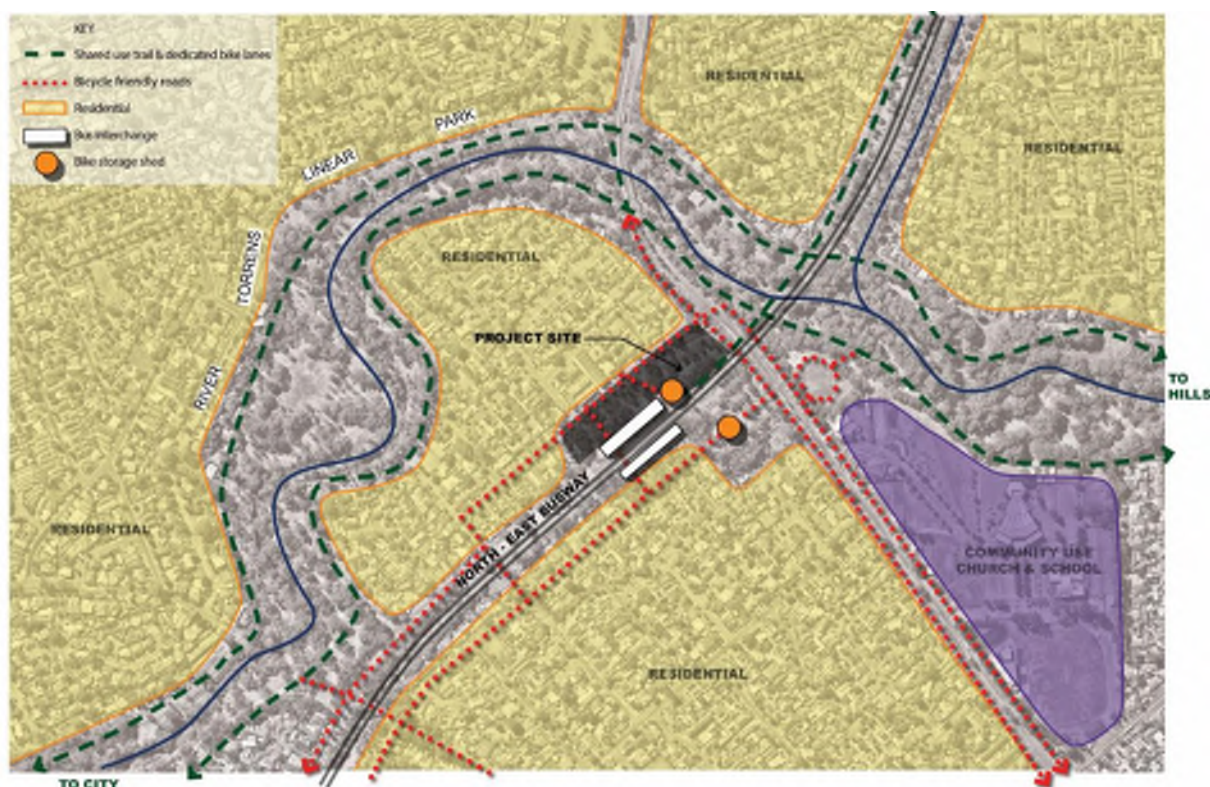


Figure 7.1: Existing pedestrian movements and pathways beyond the Paradise Park'n'Ride site.



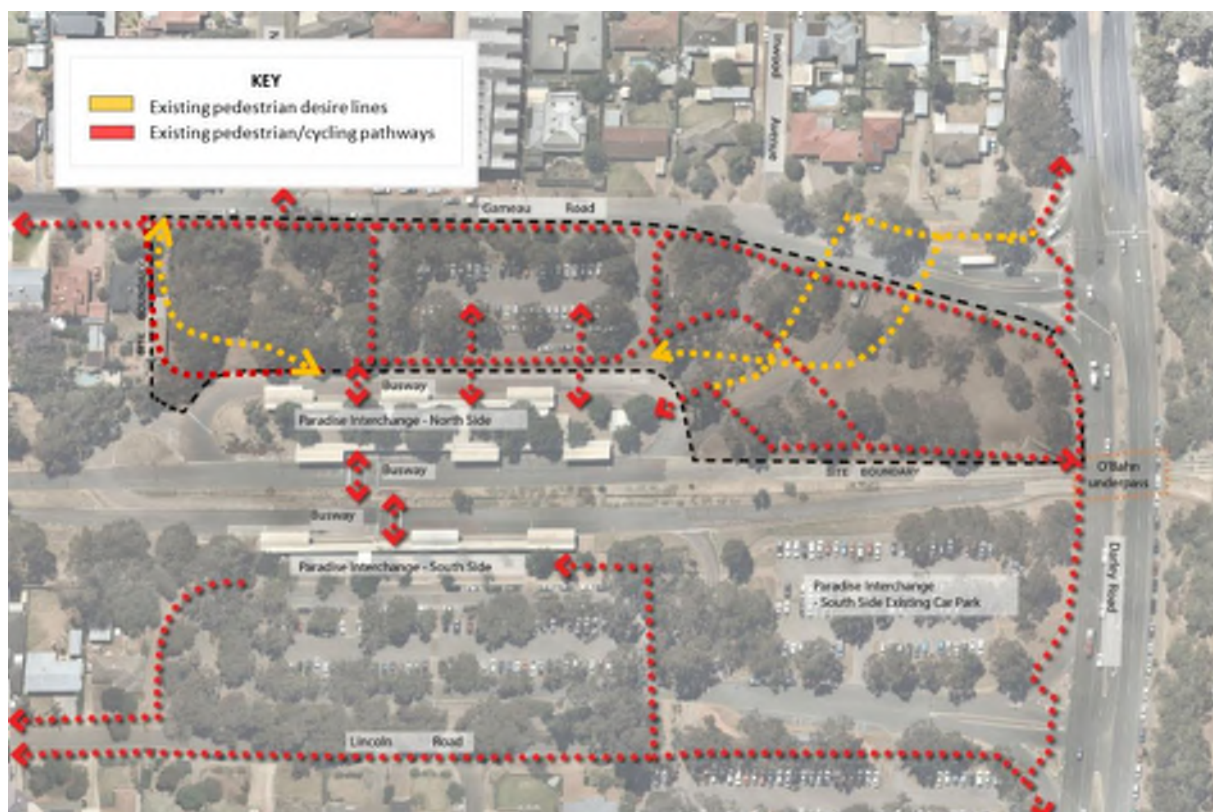


Figure 7.2: Existing pedestrian movements and pathways, with desire lines on the northern side of the interchange.



Figure 7.3(a): Strava Global Heatmap data for running in proximity to Paradise Interchange.





Figure 7.3(b): Strava Global Heatmap data for cycling in proximity to Paradise Interchange.

## Construction impacts and mitigation

Pedestrian and cycling access will be maintained during construction. This will be achieved through a staged construction schedule, currently planned in the following sequence:

- construction of the revised in and out bus roads (including pedestrian access) first, whilst access to the western carpark and eastern carpark site is maintained.
- upon completion of the revised bus in and out roads construction of the eastern at grade carpark will commence. Access to the centre island of the revised bus in and out road and the existing carpark at the western end will be maintained whilst construction occurs.
- upon completion of the eastern at grade carpark work will commence on the carpark site at the western end. At this time access to the centre island of the revised bus in and out road and to the pathways of the new carpark at the eastern end will be accessible to pedestrians and cyclists.
- access along the shared use path along the O-Bahn Busway will be maintained during construction.
- temporary diversions during construction will be required to enable the upgrade to deliver a safer point of access to the eastern end of the bus interchange, including cyclists accessing the existing cycle storage cage on the interchange platform (refer to Section 7.1 regarding location of cycle storage).

### 7.1.1. Operational Impacts and mitigation

To ensure access by pedestrians and cyclists is maintained and safety is enhanced the following works will be undertaken by the project:

- provision of a pathway at the western end of the western carpark to replace the existing path access from the junction of Norman Street/ Gameau Road to the northern side of the bus interchange.
- pedestrian connection linking the O-Bahn platforms to the car park structure past pedestrian stairs and a link Gameau Road to via a pedestrian zebra crossing at ground level. The pedestrian connections into the deck car park align with the existing pedestrian crossings locations to the centre platform of the bus interchange.

- to maximise safety, avoid path duplication and increase space for amenity planting no path will be provided alongside the eastern end of the single deck carpark adjacent to the bus entry road.
- a revised shared use path alignment through the centre of the bus in and out island (at a similar location to existing desire lines) for both pedestrians and cyclists with a revised, safer crossing location to access the eastern end of the bus interchange.
- an upgrade to the footpath along Gameau Road frontage of the site providing connection to Darley Road in the east and the residential catchment to the west.
- a path along the western side of the new eastern at grade carpark with pedestrian barrier along the eastern side of the relocated bus out road to direct car park patrons to a safer crossing location
- maintain the existing shared use path alignment along the northern edge of the O-Bahn corridor with an upgrade at the western end to a safer crossing location to access the eastern end of the bus interchange.

The revised pedestrian pathways to account for desire lines whilst improving safety are identified in Figure 7.4 below.

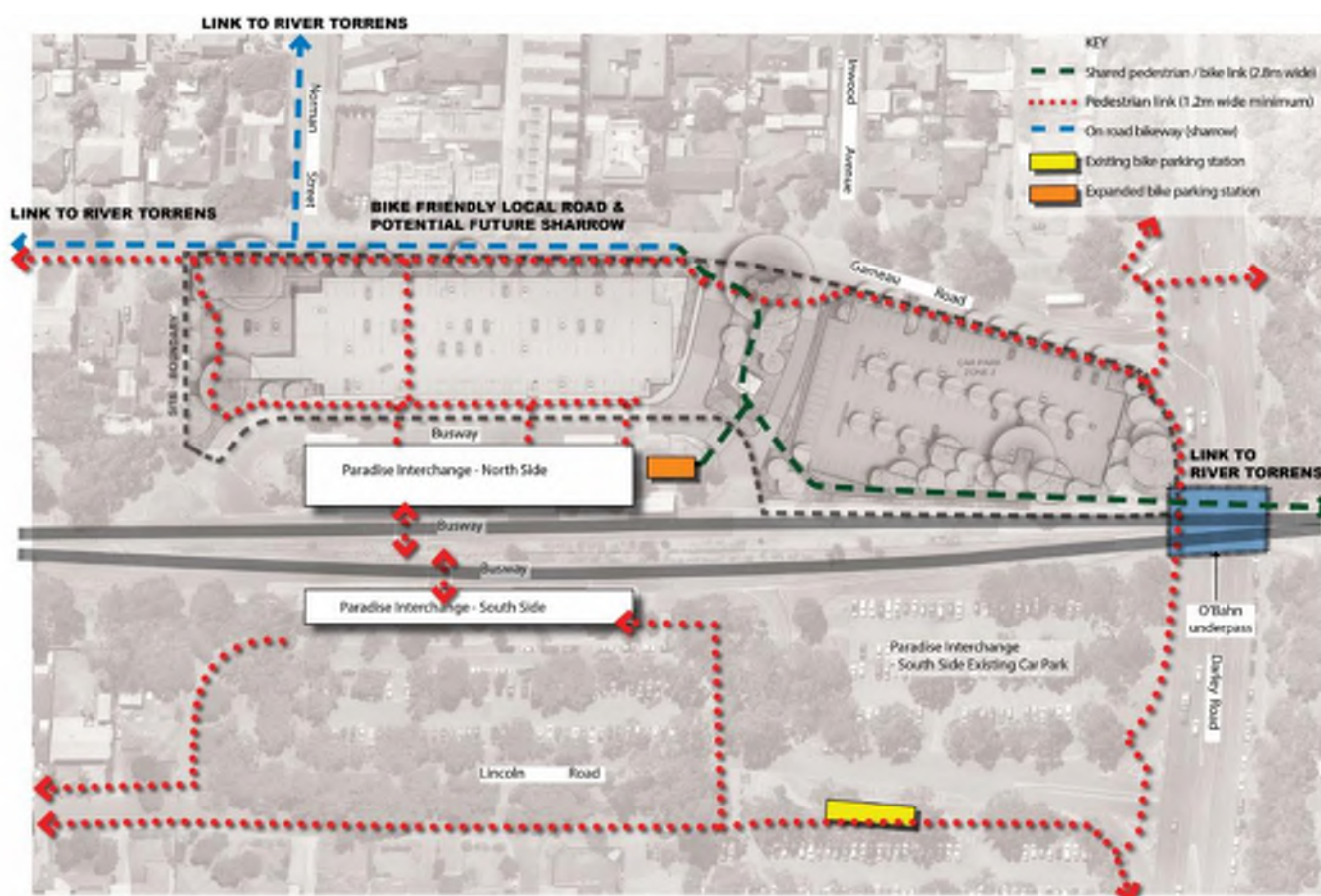


Figure 7.4: Revised pedestrian pathways accommodating previous movements safely on the northern side of the interchange.





Figure 7.5: Existing shared use path (and desire line) at the western end of the northern carpark



Figure 7.7: Existing shared use path(s) entering the end of the interchange from the Torrens River



Figure 7.6: Existing pedestrian desire line viewed from the bus in/out island to the northeast at Darley Road



Figure 7.8: Existing pedestrian access on the eastern end viewed from the bus interchange. Desire line through the bus in/out island to the left centre of image, shared use path to the Torrens Linear Park to the east near centre of image



## 7.2. Cycle storage

### 7.2.1. Existing conditions

During design the PTP Alliance undertook a site audit of existing cycle facilities. There is currently a total of 46 existing cycling facilities on the northern side of the interchange consists of:

- Five (5) cycle boxes providing 10 spaces (double sided) and five (5) cycle hoops in the south western corner of the existing carpark between the existing Kiss 'n' Drop and bus interchange (refer to Attachment 14).
- Five (5) cycle boxes providing 10 spaces (double sided) and five (5) cycle hoops on eastern end of the existing carpark adjacent to the carpark in access road (refer to Attachment 13).
- 16 cycle capacity storage cages at the eastern end of the interchange platform (refer to Attachment 14).

The extent and frequency of use of the 20 space cycling storage boxes has not been confirmed. During several site inspections limited use (1-2 bikes) were observed at the bike hoops, with the cycling storage cage routinely observed at approximately 50% capacity between the months of February to April 2019.

### 7.2.2. Construction impacts and mitigation

As with pedestrian and cycling access cycling storage will be maintained during construction. The construction staging schedule is currently in preparation, with the sequencing currently scheduled as follows:

- Prior to construction commencing confirm extent existing use of the blue cycling storage boxes, engage with existing users and implement a decommissioning strategy to ensure adequate storage and access to facilities is maintained during construction, and aligns with provision planned for operation.
- Plan to extend the existing cycle storage cage on the interchange to increase current capacity from 16 to a minimum of 32 cycles early in the construction program. Provide temporary storage facilities during construction which may include temporarily relocating the existing blue cycle storage boxes to the interchange platform until the extended cycling cage is completed.

### 7.2.3. Operational impact and mitigation

Prior to construction the combined formal cycle storage capacity of the three locations on the northern side of the interchange produced a total of 46 spaces. Upon completion of the project there will be cycling storage totaling a minimum of 36 spaces (minimum of 32 cycles in the cycles storage cage, cycle hoops for 4 cycles).

Upon completion cycle storage will be at two locations:

- The cycle capacity storage cage at the eastern end of the bus interchange (retained and extended).
- Cycle hoops at the south western corner of the western carpark.

A space provision for additional cycle cages on the western end of the western carpark adjacent to the deck carpark ramp will be available if demand exceeds capacity.

## 7.3. Traffic

### 7.3.1. Existing conditions

Darley Road is a DPTI owned urban sub-arterial road providing access to North East Road to the north and Lower North East Road to the south. Gameau Road is under the care and control of the Campbelltown City Council and is a minor local road which provides access to residential land uses.

### Passenger vehicles

There are currently 60 at grade parking spaces in the (P1) north of the existing bus interchange, accessed from Gameau Road. In addition, there are 10 Kiss 'N' Ride short term parking spaces provided between the northern carpark and the bus interchange.

Access to the existing carpark consists of separate access (entry) and egress (exit) roads located opposite residential property numbers 23 Gameau Road and 19C Gameau Road respectively.

## **Buses**

Access for public transport bus services between Darley Road and the O-Bahn interchange is provided via dedicated access roads connecting Gameau Road to the O-Bahn interchange platforms. The separate access and egress roads are located opposite Inwood Avenue and residential property number 27 Gameau Road respectively.

## **Traffic Impact Assessment**

As part of the Traffic Impact Assessment the PTP Alliance observed traffic movements in the AM (7:00AM – 9:00AM) and PM (4:00 – 6:00PM) peak periods on Thursday 14 March 2019 to understand the existing traffic conditions and pedestrian movements around the project area.

The following observations were made:

- On arrival at 7:00AM, a portion of car parks in the northern interchange car park were already occupied. The northern interchange car park was fully occupied by 8:00AM, however there was a continuous flow of vehicles accessing the interchange beyond 8:00AM, mainly for kiss and ride.
- Several vehicles were observed entering the car park looking for unavailable car parking
- A significant portion of parking across the precinct were unoccupied prior to the road network peak hour
- A significant volume of drivers currently use Gameau Road and Church Road as a “rat-run” in both the AM and PM peak periods to avoid queues and delays at the Lower North East Road / Darley Road signalised intersection, approx. 850m south of Gameau Road
- Darley Road is a six lane, two-way road, however during peak periods operates essentially as four lane, two-way road due to overflow parking from the Paradise Interchange. It was observed that the kerbside northbound lane is parked out before 8:00am. Existing parking restrictions are in place between 7:00am and 9:00am on the departure side of the southbound kerbside lane
- As a result of the on-street parking on Darley Road, a high number of pedestrian movements across Darley Road were observed, not being undertaken at the traffic signals
- Queues on Gameau Road extend back to the bus access roads and impact on the ability for buses to exit the interchange, resulting in queueing of buses along the bus access road
- As per the Road Safety Audit (RSA) undertaken at the Paradise Interchange as part of the NEPTS project, in peak periods there are significant delays (up to 180 seconds) associated with the right turn from the Interchange Road (approx. 200m south of Gameau Road).

### **7.3.2 Construction impacts and mitigation**

Traffic access to Darley and Gameau Roads will be maintained during construction in accordance with a construction traffic management plan. Access to carparking and access for bus services on the northern side of the interchange is able to be achieved through a staged construction, currently planned in the following sequence:

- Construction of the revised in and out bus roads whilst access to the western carpark and eastern carpark site is maintained.
- Upon completion of the revised bus in and out roads construction of the eastern carpark of the site will commence. Parking access to the existing carpark at the western end will be maintained.
- Upon completion and opening of the eastern at grade carpark work will commence on the existing carpark site at the western end.
- Parking on the southern side of the bus interchange and existing on-street car parking on Darley Road will not be affected.

## Operational impacts and mitigation

As this project will result in additional parking spaces in the northern carpark located off Gameau Road the PTPA undertook a traffic assessment for that area. The initial assessment was undertaken based on the 50% reference design as that was the design available at that time. The assessment is currently undergoing and review and update based on the 100% design.

The initial assessment undertook SIDRA intersection modelling for the Darley Road / Gameau Road signalised intersection for 2018 (existing), 2020 (day opening) and 2036 (future) scenarios. The modelling results indicate that the existing Darley Road / Gameau Road intersection configuration will not meet requirements in terms of degree of saturation (DOS) with the introduction additional car parking generated traffic in 2020, as per DPTI SIDRA modelling guidelines in it's current form. Additionally, the right turns from Darley Road and Gameau Road operate at Level of Service E with delay upwards of 60 seconds (*note: that the SIDRA model is considered to be a worst-case assessment and considered conservative*).

To enable the intersection to meet DOS requirements and to reduce predicted increases in delay to right turn movements, the preliminary assessment identified works in proximity to the Darley Road / Gameau Road signalised intersection that could be considered. These included:

- restricting on-street parking on Darley Road (at least for a short extent) to improve through movement capacity;
- extension of right turn pocket on Darley Road (into Gameau Road) from to limit the potential queue overspill into southbound through lanes resulting in reduced through movement capacity on Darley Road;
- conversion of the existing low-angle left turn treatment from Darley Road to Gameau Road to a high-angle left turn treatment once the at-grade car park is operational to enhance safety; and
- the provision of 'keep clear' line marking on Gameau Road directly fronting the bus egress road to minimise the risk of bus operations being impacted by queueing at peak times.

Once the initial assessment has been reviewed and updated for the 100% design the PTP Alliance will consult with DPTI and the Campbelltown City Council regarding need for potential mitigation works for the Darley Road / Gameau Road intersection.

Bus numbers are anticipated to remain the same. The realignment changes to the bus access and egress from Gameau Road have been made in consultation with DPTI bus operations and are expected to result in an improvement to operational efficiency at the Interchange. This includes capacity for bus layovers immediately adjacent to the new bus access road.

## 7.4. Flora and Fauna

### 7.4.1. Existing Conditions

#### Ecological assessment

A Fauna Assessment for the northern section for the Paradise Interchange was undertaken by EBS in February 2019. One Nationally threatened, one State threatened, and six Regionally threatened and near-threatened fauna species *may* use the scattered trees within the project area for nesting, foraging and/or perching (resting and surveillance of prey).

Native trees with a canopy spread >5 m and with good canopy structure may provide habitat for Common Brush-tailed Possums (*Trichosurus vulpecula*), Common Ringtail Possums (*Pseudocheirus peregrinus*), Grey-headed Flying Foxes (*Pteropus poliocephalus*), Southern Boobooks (*Ninox boobook*), Tawny Frogmouths (*Podargus strigoides*) and Tree Martins (*Petrochelidon nigricans*). While those with a canopy spread of <5 m but with low lateral branches may provide habitat for Willie Wagtails (*Rhipidura leucophrys*). Trees, native and exotic, with a canopy spread of <5m and an absence of low lateral branches were not considered to support threatened or uncommon fauna species.

A total of 94 of the 127 surveyed trees and weed groups scored a maximum threatened species score of 3, meaning that at least two uncommon/ near-threatened or one rare species (at regional, state or national level) could utilize these trees. As such, the Significant and Regulated trees (as assessed by an arborist under the current Development Regulations 2008) recorded within project area are the most valuable to fauna species and



should therefore be the focus for the retention of any trees within the project design. The most important tree species to threatened fauna within the project area were *Eucalyptus* and *Corymbia* species, as they provided resting and foraging stratus.

### Arboriculture assessment

Section 6.2.6 discusses the Significant and Regulated trees within the project area utilising an Arboriculture assessment of the site that was undertaken in February 2019 and reviewed again in April 2019.

This section of the report identifies the unregulated trees assessed by the arborist and the impacts from the project.

A total of 127 trees were assessed and three were identified as Significant Trees, nine as Regulated Trees, whilst the remaining 115 identified as unregulated trees under the *Development Act 1993*.

This assessment identified that of the 115 unregulated trees:

- There are 115 trees which are not subject to legislative control therefore tree damaging activity, including their removal if required, does not require consideration for a development application.
- Tree 108, whilst unregulated, is an asset of the City of Campbelltown Council and therefore its protection is required in accordance with AS4970-2009. Approval to remove the tree is required from Council.

The assessment identified that of the 115 unregulated trees, the tree population included a variety of exotic, indigenous and Australian native species. The dominant species on site is *Corymbia Maculata* (Spotted Gum) which accounts for almost 50% of the overall population. See Table 7.1 below for the types of unregulated trees found on the site.

**Table 7.1: Unregulated tree types identified and quantities**

Botanic Name	Common Name	Number of Trees	Origin
<i>Corymbia maculata</i>	Spotted Gum	61	Native
<i>Corymbia citriodora</i>	Lemon Scented Gum	19	Native
<i>Eucalyptus leucoxylon</i>	South Australian Blue Gum	18	Indigenous
<i>Eucalyptus camaldulensis</i>	River Red Gum	12	Indigenous
<i>Fraxinus angustifolia</i> ssp. <i>angustifolia</i>	Desert Ash	3	Exotic
Group - Weed	Various	3	Weed
<i>Eucalyptus campaspe</i>	Silver Gimlet	1	Native

A total of 86 trees were identified as suitable for retention as they achieved a Moderate Retention Rating (as per Table 7.2 below).

**Table 7.2: Tree retention ratings and quantities for unregulated trees**

Retention Rating	Number of Trees
High	NA
Moderate	86
Low	29

The remaining 29 trees achieved a Low Retention Rating indicating that design constraint, alternative designs or tree-friendly construction methodologies are not considered warranted by the arborist.

#### 7.4.2 Construction impacts and mitigation

##### **Regulated (R) and Regulated Significant (RS) tree impacts**

Regulated and Regulated Significant trees are subject to approval provisions documented in the *Development Act 1993*. Tree damaging activities for this project are identified in Section 6.2.6. For a plan of trees to be retained on site, refer to Attachment 4.

##### **Unregulated Amenity Planting tree impacts**

Unregulated trees are not subject to approval provisions documented in the *Development Act 1993*, rather subject to approval provisions documented in the DPTI Vegetation Removal Policy.

As part of this project, the following removals are required:

- **Removal of 16 unregulated trees**, due to the Arborist's recommendation for removal based on poor tree structure, low retention and potential safety hazards on site (including 7 trees on the western carpark side and 9 trees on the eastern carpark end and bus in/out zone).
- **Removal of 45 unregulated trees**, due to the location within the footprint of the single deck carpark (Western side).
- **Removal of 38 unregulated trees**, due to the alterations associated with the bus access to Gameau Road or the new at grade carpark near the corner of Gameau Road / Darley Road (Eastern Side).

As a result, 99 unregulated trees will require removal and 16 unregulated trees will be unaffected by the works.

##### **Tree removal offset requirements**

In accordance with the *Development Act 1993* a 2:1 offset applies to Regulated trees and a 3:1 offset applies to Regulated significant trees. If it is not feasible to provide replacement plantings on-ground, a payment in accordance with the gazetted Development Application Fees may be made into the Planning and Development Fund. From 1<sup>st</sup> of July 2016, the fee is set at \$89.50 (GST exempt) per tree (i.e. 2:1 or \$179 for removing a regulated tree; 3:1 or \$268.50 for removing a significant tree).

In accordance with DPTI's Vegetation Removal Policy all amenity vegetation removed requires approval by the DPTI Senior Environment Management Officer and an offset of 1:1 applies. If it is not feasible to provide replacement plantings on-ground, a payment into DPTI's Amenity Planting Fund of \$89.50 (GST exempt) per tree is required.

Whilst approval by the DPTI Senior Environment Management Officer has been identified in the *DPTI Vegetation Removal Policy*, Campbelltown City Council will also be advised.

The landscape plan is unable to account for all tree removal offset replacement plantings on-ground due to space constraints. The landscape plan currently identifies replacement of 53 semi advanced trees of the 113-tree offset required. Refer to Table 7.3 below for the number of removal offsets required for each of the tree legislation statuses.

To comply with the *Development Act 1993* and DPTI's Vegetation Removal Policy, the vegetation offset will comprise of the elements in Table 7.3.

**Table 7.3: Number of trees to be removed and offsets required.**

Tree number removed	Legislation Status	Offset Required	Offset/Fund Payment
7	Regulated	2:1, total of 14 trees	Offset by 14 trees in landscape plan
0	Significant	3:1, total of 0 trees	NA
52	Unregulated amenity planting (Western Carpark)	1:1, total of 52 trees	Offset by 39 trees planted in landscape plan. The remaining 13 trees require a payment of \$1,163.50 to DPTI Amenity Planting Fund
47	Unregulated amenity planting (Eastern Carpark)	1:1, total of 47 trees	Offset by \$4,206.00 payment to DPTI Amenity Planting Fund
		<b>Total = 113 trees</b>	<b>Total = \$5,370.00</b>

The landscape design will include green infrastructure and improve biodiversity to the project by careful selection of trees and shrubs that are self-sustaining to avoid ongoing irrigation or regular replanting.

The current landscape palette includes trees, shrubs, groundcovers and grasses which is included in Appendix A. Tree species contributing to 53 trees of the 113 tree-offset required are listed below in Table 7.4.

**Table 7.4: Tree planting design species list**

Species Name	Common Name	Quantity
<i>Corymbia citriodora</i> 'Scentuous'	Dwarf Lemon Scented Gum	24
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	7
<i>Corymbia maculata</i>	Spotted Gum	10
<i>Koelreuteria paniculata</i>	Golden Rain Tree	12
	<b>Total</b>	<b>53</b>

For the garden beds, the species will predominately comprise of vegetation as per Table 7.5 below.

**Table 7.5: Garden bed planting design species list**

Garden Bed Type	Species Name
Embankment Mix	<i>Kennedia glabrata</i> ; <i>Eremophila glabra</i> 'Kalbarri Carpet'; <i>Eutaxia microphylla</i>
Woodland Mix	<i>Chrysocephalum apiculatum</i> ; <i>Enchylaena tomentosa</i> ; <i>Myoporum parvifolium</i>
Shaded Area Mix	<i>Nephrolepis cordifolia</i> ; <i>Liriope muscari</i> ; <i>Dianella tasmanica</i>
Car Park Mix	<i>Bolboschoenus caldwellii</i> ; <i>Ficinia nodosa</i>
Retaining Wall	<i>Ficus pumila</i>

The garden bed landscape plan comprises of an approximate total of 8,123 plants and approximately 3,200 m<sup>2</sup> of garden bed.



All plant species selections will be undertaken in collaboration with the City of Campbelltown Council and DPTI and will comply with DPTI *Operation Instruction Trees in Median and Roadsides in the Urban Environment*.

To avoid a direct impact to flora and fauna during construction, the following mitigation strategies have been identified:

- within the Contractor's Environmental Management Plan (CEMP), identify Tree Protection Zones for trees at risk of damage (both canopy and root impacts) and protect by demarcating the area to minimise risk during construction activities;
- disturbance of areas with vegetation will be minimised as much as possible; and
- undertake an inspection of any tree to be pruned by a qualified arborist and any pruning undertaken by a qualified arborist in accordance with AS 4373 "*Pruning of Amenity Trees*" and the DPTI Master Specification.

#### 7.4.3. Operational impacts and mitigation

By planting the landscaped garden beds the project does not significantly change the existing operational impact of maintaining amenity vegetation for the Adelaide Metro public transport network of the O-Bahn busway alignment. Ensuring amenity generally will be maintained.

### 7.5. Noise and vibration

#### 7.5.1. Existing conditions

Currently at the Paradise Interchange there is 60 car park spaces on the northern side of the bus interchange. The existing acoustic ambience of the locality is dominated by noise from bus activity associated with the O-Bahn busway and interchange and the road traffic on Darley Road and Gameau Road.

The ambient noise levels vary throughout the day and at night, depending on the frequency of bus movements, activity at the interchange and the traffic volumes on the surrounding roads. Based on traffic data provided by DPTI, it was determined that the peak periods for traffic activity at the site occur between 7:45am – 8:45am and between 4:45pm – 5:45pm which is the expected arriving and departing times at the interchange.

The proposed development will include no change to the existing carpark located on the Southern side of the interchange, and to the existing bus service and arrangement. Commuters using the O-Bahn service currently park their cars along both sides of Darley Road, so it is anticipated that the additional parking spaces bays from the development will be utilised by these commuters still. The closest noise sensitive receivers have been identified to be the single and two-story dwellings fronting Gameau Road to the north of the development.

The main noise sources associated with the Paradise Park'n'Ride development are the following operational impacts following the upgrade are:

- additional carpark activity (door shutting) associated with additional car parks;
- additional number of cars traversing Gameau Road to access the carpark.

Environmental noise assessments have been conducted to address these sources of potential noise pollution to the closest dwellings and identified sensitive receivers. The assessment has predicted the noise levels at the closest dwellings by comparing the activity from an increase in parking spaces with the relevant requirements of the *Environment Protection (Noise) Policy 2007* and the Campbelltown Council Development Plan. Also, the addition of cars traversing Gameau Road generated by the upgrade has been compared to the *Road Traffic Noise Guidelines* recommended by DPTI.

Noise monitoring was conducted at 15 Gameau Road as shown in Figure 7.9 to determine existing noise impacts to the sensitive receivers.



**Figure 7.9: Baseline noise monitoring position.**

The results from the noise monitoring provided the following Table 7.6 which demonstrates measured peak traffic periods and Table 7.7 showing measured noise during daytime and night time periods.

**Table 7.6: Measured noise levels during peak traffic periods**

Noise Level	Measured Noise Level, dB(A)
Background, $L_{A90}$	43 – 54
Ambient, $L_{Aeq}$	54 – 62
Maximum, $L_{Amax}$	68 – 82

**Table 7.7: Measured daytime and night-time noise levels**

Noise Level	Measured Noise Level, dB(A)	
	Daytime (7am to 10pm)	Night-time (10pm to 7am)
Background, $L_{A90}$	38 – 54	31 – 49
Ambient, $L_{Aeq}$	48 – 63	33 – 59
Maximum, $L_{Amax}$	65 – 86	42 – 78

In terms of vibration, the development essentially does not change the nature or type of vibration sources at the site. Gameau Road is located between the site and the closest dwellings, and currently carry cars, busses and other vehicle types. It is understood that vibration is currently not perceived at these dwellings and therefore is not an existing issue.

### 7.5.2. Construction impact and mitigation

Whilst Section 22 of the *Environment Protection (Noise) Policy 2007* specifically excludes road, rail and public infrastructure construction work from Division 1 of the Policy (which deals with construction noise), DPTI and its contractors still have a responsibility under Section 25 of the *Environment Protection Act 1993* to have a *duty of care* to not pollute the environment through noisy activities. DPTI Construction and Maintenance Activities, Operational Instruction 21.7 (EI 21.7) provides a structure for compliance with this *duty of care*.

In accordance with the PS&TR for the PTPA, an investigation of existing and predicted noise levels and the impact of this project in accordance the EI 21.7 is required. EI 21.7 establishes the noise mitigation and consultation requirements for infrastructure works and maintenance to ensure the impact of work on adjacent receivers is minimised and a structure is provided for compliance with legislative requirements.

The impact on nearby sensitive receivers would be limited to those receptors adjacent to the construction activities (Gameau Road). These impacts will be short term and generally within normal working hours.

Some mitigation strategies that could be considered are:

- No unnecessary shouting or loud stereos on site.
- Material crushing, if required, will be carried out in a suitable location away from the sensitive receptors.
- High noise activities will be restricted to normal weekday working hours, unless prior approval, notification and preparation of a Night Works Management Plan is undertaken
- All equipment and vehicles will be maintained in good working order.
- Site induction for all staff expected to work within the prescribed working distances.

### 7.5.3. Operational impact and mitigation

To assess the effect the operation of the proposed upgrade will have in terms of noise from additional carpark activity, the highest predicted noise levels at any dwelling and a comparison with the noise criteria are provided in Table 7.8 below.

**Table 7.8: Predicted noise level and comparison with noise criteria for expected additional carpark activity.**

Noise Level	Day (7am to 10pm)	Night (10pm to 7am)
Criterion, dB(A):		
Average Noise Level, $L_{eq}$	50	43
Maximum Noise Level, $L_{max}$	-	78
Prediction, dB(A):		
Average Noise Level, $L_{eq}$	43	38
Maximum Noise Level, $L_{max}$	-	64
Compliance	<b>Yes</b>	<b>Yes</b>

Table 7.8 shows that the noise from additional carpark activity at the development will achieve the requirements of the *Environment Protection (Noise) Policy 2007* at all surrounding dwellings.

To assess the effect the operation of the proposed Park'n'Ride will have in terms of noise from an increase in cars upgrade traversing Gameau Road, the highest predicted noise levels at any dwelling and a comparison with the noise criteria are provided in Table 7.9 below.



**Table 7.9: Predicted noise level and comparison with noise criteria for expected additional cars traversing Gameau Road.**

Noise Level	Day (7am to 10pm)	Night (10pm to 7am)
Criterion, dB(A)	60	55
Prediction, dB(A)	52	50
Compliance	<b>Yes</b>	<b>Yes</b>

Table 7.9 shows that the noise from expected additional cars traversing Gameau Road will achieve the noise criteria from the *Road Traffic Noise Guidelines* recommended by DPTI at all surrounding dwellings.

Monitoring of internal noise levels of residences along Gameau Road and close consultation with receptors during the operation of the project will confirm the noise levels experiences and whether a significant impact is occurring. Mitigation strategies could then be implemented to ensure the receptors are not subject to a significant impact.

Given the interchange is located at least 25 metres from the closest dwellings as compared with Gameau Road that is 10 metres away, any potential vibration from the development will be no greater than the existing levels at the dwellings. As such, it is not expected that the development will result in a change in the existing vibration impact at the dwellings.

To summarise, the operational noise levels from the Paradise interchange at its maximum noise levels (and vibration) will be no greater than the existing levels at the site. Based on this assessment, it is considered that the proposal satisfies all the relevant environmental noise provisions of the Campbelltown Council Development Plan.

## 7.6. Lightspill

### 7.6.1.Existing conditions

#### Gameau Road

There are six (6) street lights on the northern side of Gameau Road between Darley Road and Norman Street: at the junction of Darley Road, at the local access road, at the western side of Inwood Avenue, at the eastern boundary of 23 Gameau Road, the western boundary of 25 Gameau Road and at the western side of Norman Street.

There are four (4) street lights on the southern side of Gameau Road: at the junction of Darley Road, at the existing bus interchange exit, at the existing bus interchange entry and at the western end of the existing carpark adjacent to the pedestrian access on Gameau Road. Refer to Attachment 5.

#### Existing western carpark

Within the existing at grade carpark (western side) there are:

- One single light at the foot of the vegetated embankment (in line with street light at property number 25)
- One single light each midway along the western and eastern ends of the carpark
- Two sets of double lights on the median and the Kiss 'N' Ride
- Three sets of double lights on the paved median between the Kiss 'N' Ride and the bus interchange.

Refer to figures in Attachment 5 for images.

## 7.6.2. Operational impacts and mitigation

New lighting and the upgrading of existing lighting for the carpark, the upper level of the single deck carpark, the pedestrian and cycling connections will be undertaken as part of the project.

As the lighting is to be operational during the night in an open space the light spill will be assessed to the curfew criteria of Australian Standard (AS) AS4282 – Control of the obtrusive effects of outdoor lighting.

The amount of light that reaches neighbouring residence (measured in lux) and the luminous intensity emitted from visible luminaires (measured in Candela) are assessed. These technical parameters are modelled and calculated through ElumTools.

Lighting units will not be installed with an upward tilt and have been selected to only have downward light distribution to minimise upward light ratio (direct spill light into the sky).

The control system considered will be capable of smart lighting controls to dim lights to a lower output level during times of inactivity and/or during the night to improve energy efficiency and reduce unnecessary light output. However, some level of artificial light will be required to improve the effectiveness of the CCTV cameras.

The street lighting on the southern side of Gameau Road will be adjusted to align with the new bus in and bus out roads. The street lighting on the northern side of Gameau Road will not change.

## 7.7. Headlight nuisance

### 7.7.1. Existing conditions

Passenger vehicles currently exit the existing western carpark access onto Gameau Road opposite 19C Gameau Road (refer to Figure 7.10), one of five (5) street fronting two story townhouses.

Buses exiting the Paradise Interchange currently exit opposite a single-story residence at 31 Gameau Road.

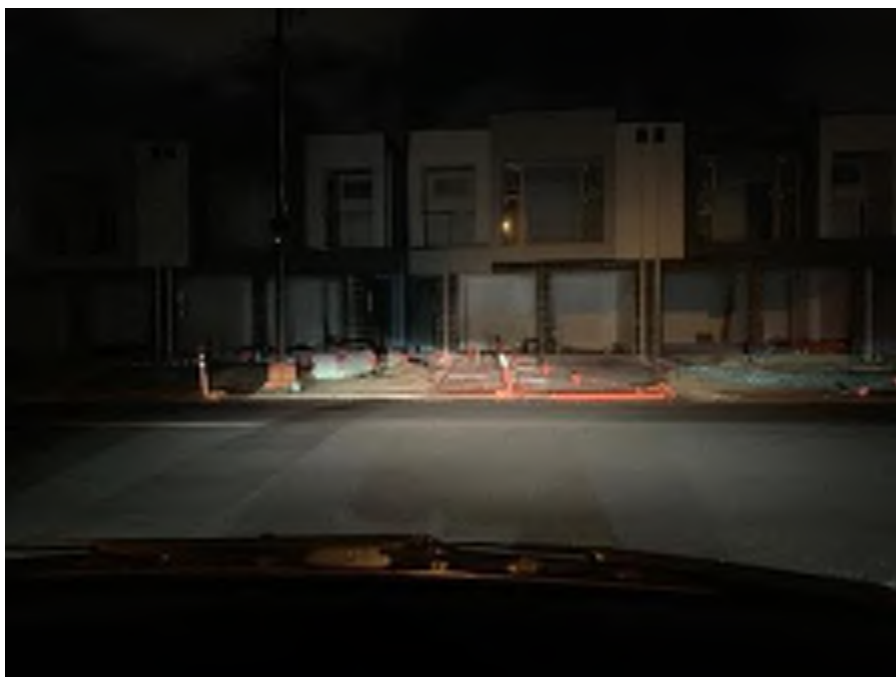


Figure 7.10: Existing Paradise Park 'N Ride vehicle carpark egress opposite 19C Gameau Road.

### 7.7.2. Operational impacts and mitigation

Upon completion all passenger vehicles departing the western carpark will do so from the same location as before the carpark upgrade, opposite 19C Gameau Road. As the property is now a two-story townhouse, headlights from exiting passenger vehicles will be directed at the ground level garages.

Passenger vehicle headlight nuisance within the western carpark at grade is not anticipated to change from existing conditions as the part of the vegetated embankment will be retained in addition to construction of a retaining wall under the deck carpark of approximately 120 m.

To address vehicle headlight nuisance on the single deck of the carpark a second layer of metal cladding (the same material as the exterior cladding) will be fixed to the internal structure, offset to the external cladding. This will be in addition to the w-beam vehicle stop barrier and installed to ensure impacts to multi story residences across Gameau Road are minimised. External to the structure the cladding and trees (both retained and planted) will also provide screening of vehicle headlights.

Any change to existing headlight nuisance to Gameau Road residents associated with the eastern carpark will be mitigated by using the existing bus egress opposite 31 Gameau Road for the new eastern carpark egress. The majority of the headlight nuisance from within the eastern carpark will be shielded by the new retaining wall and topography adjacent to the carpark location on Gameau Road.

To mitigate and minimise the headlight nuisance from the new bus egress the design has sought to have the access to Gameau Road align with Inwood Avenue rather than residential properties at 27 or 29 Gameau Road.

## 7.8. Air Quality

### 7.8.1. Existing conditions

Existing background air quality concentrations for each pollutant have been taken into account in the modelling based on a nearest EPA monitoring station (Elizabeth Downs) to assess cumulative air quality impact from the existing conditions together with the new bus interchange. Existing sensitive receivers were identified for the assessment, refer to Figure 7.11 below.

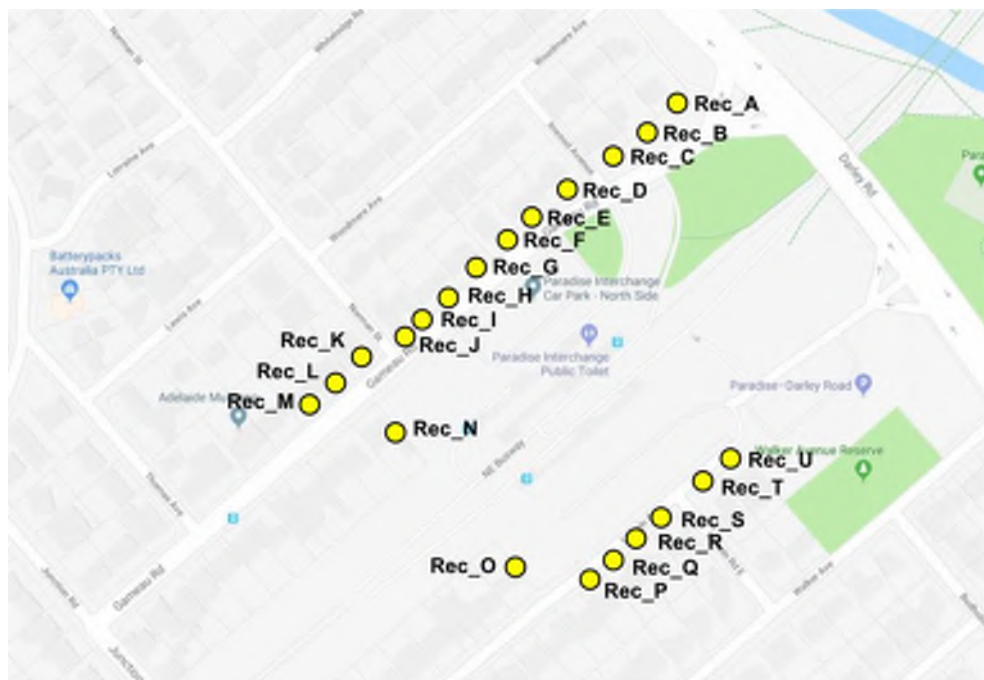


Figure 7.11: Sensitive receivers identified in the vicinity of the Paradise bus interchange.



### 7.8.2. Construction impacts and mitigation

The project will involve construction activities that could result in the emission of dust, particularly during windy conditions. The equipment and vehicles associated with the works could potentially cause temporary local degradation in air quality due to exhaust emissions particularly during still conditions.

The impact on nearby sensitive receptors, which would be limited to the air quality receptors adjacent to construction would not be significant if managed through the implementation of the following strategies:

- Cease any activity where that activity creates a dust hazard of nuisance to the public, personnel working on the site or properties in the vicinity of the works covering loads carried by trucks;
- Promptly removing any material that is spilt on to public roads or other sealed pavements;
- Schedule roads to be swept by street sweepers;
- Avoid or minimise dust-generating activities during dry and windy conditions;
- Minimise the extent of exposed, stripped surface until covered with appropriate fill material;
- Air quality monitoring (visual) will be used to monitor air quality impacts;
- Dust aerosolisation would be prevented through wetting of loose material prior to its disturbance;
- Material would not be stockpiled adjacent to sensitive receivers;
- All plant equipment and vehicles will not idle for extended periods of time; they will be switched off if not in operation. Mobile and static emission sources will be kept away from sensitive receivers, if possible. Exhaust emissions from construction vehicles would be minimised by having properly maintained vehicles in use;
- Vehicles and equipment will be maintained in accordance with manufacturers' specifications to ensure emissions comply with EPA emission limits.

### 7.8.3. Operational impacts and mitigation

An air quality assessment has been undertaken to compare the existing background concentrations at the Paradise interchange site against the expected operational air quality conditions in 2036. These impacts were modelled at the locations of the sensitive receivers (refer to Figure 7.11 above).

The AERMOD dispersion modelling of the future Paradise bus interchange shows that the NEPM and South Australia Environment Protection (Air Quality) Policy criteria are met for carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) pollutants for all averaging periods at the sensitive receivers.

## 7.9. Water

### 7.9.1. Existing Conditions

The closest receiving water environment is the Torrens River which is approximately 100m to the east, 300m to the west and 400m to the north of the site respectively.

The existing drainage system can be split into two catchments;

- The western catchment (the current western P1 carpark) comprises of 300 mm and 375 mm reinforced concrete pipes connected by pits and junction boxes to capture runoff and direct it to the stormwater via 600mm diameter pipe that heads east to the Torrens River along the O-Bahn alignment. The total surface area of non-permeable surface of the existing carpark is approximately 2,500 m<sup>2</sup>. As the carpark was originally constructed in 1985 no on-site pre-treatment detention or water sensitive urban design (WSUD) features were required, nor installed at the time.
- The eastern catchment (area of the eastern at grade carpark) consists of the existing vegetated area, shared use path and busway into the existing 600mm diameter drain that heads east towards the River Torrens. The new eastern carpark will notably increase the impervious area in this location.

The catchments and connections to this existing drain are separate from each other and as a result the areas being assessed individually, as summarised in Table 7.10 below.

**Table 7.10: Existing site stormwater conditions**

Design Parameters	Eastern Catchment	Western Catchment
Total Area (ha)	0.6137	0.6615
Impervious Area (ha)	0.061	0.5273
Pervious Area (ha)	0.5523	0.1342
Time of Concentration (min)	10	10
Weighted Mean C for 5 Year	0.49	0.22
5 Year Peak Flow, $Q_5$ (m <sup>3</sup> /s)	0.032	0.075
5 Year Peak Flow, $Q_5$ (L/s)	32	75

## Groundwater

Golder Associates Pty Ltd undertook a geotechnical and site contamination investigations in January 2019. As part of this work existing groundwater ground water conditions were investigated.

Based on the available ground water bore hole records and information available from the Department for Environment and Water (DEW) Water Connect website regional groundwater depths within 1km of the site generally range between 2.9 and 24 M below ground level.

During Golder Associates Pty Ltd geotechnical investigations groundwater was encountered at a depth of 7m below ground level, resulting in a low risk of groundwater being encountered above the level of the main excavation cut. Golder Associates Pty Ltd recommended the use of continuous flight auger (CFA) piles for any piles that may extend below into the groundwater table.

A subsequent specific assessment of groundwater quality has not been undertaken as part of the project because excavations to or below the depth of groundwater are not proposed.

### 7.9.2. Construction impacts and mitigation

During construction there is a requirement to ensure that any water entering the stormwater drainage system from areas disturbed by the during construction complies with the Environment Protection (Water Quality) Policy 2003.

To minimise the risk of pollution a Soil Erosion and Drainage Management Plan (SEDMP) as part of its Contractor's Environmental Management Plan is to be developed, implemented and maintained.

The SEDMP shall address the water quality risks of the site and the works to be undertaken. It is to be developed in accordance with SA EPA Stormwater Pollution Prevention Code of Practice for Local, State and Federal Government and the DPTI Protecting Waterways Manual.

The SEDMP is to include:

- identifying, assessing and developing effective control measures for the duration of works. Control measures shall be suitable for any rainfall event that may result in surface runoff and shall be fully operational prior to commencing work.
- a regime that ensures responsibility for the design, construction, operation and maintenance of drainage and temporary erosion control measures.
- avoid unnecessary ground disturbance and provide for the proper control of stormwater runoff
- ensure that all required runoff, erosion and sediment control measures are in place and comply with its SEDMP prior to the commencement of earthworks.

- locate any stockpiles away from gutters and side entry pits.

### 7.9.3. Operational impacts and mitigation

The current design results in a non-permeable paved surface area of approximately 7,700 m<sup>2</sup> (3,050 m<sup>2</sup> for the eastern carpark and 4,650 m<sup>2</sup> for the deck in the western area carpark). This is an increase of approximately three times the existing footprint of approximately 2,500 m<sup>2</sup>. Proposed site stormwater conditions are summarised in Table 7.11 below.

**Table 7.11: Proposed site stormwater conditions**

Design Parameters	Eastern Catchment	Western Catchment
Total Area (ha)	0.6137	0.6615
%Impervious Area	70	95
%Pervious Area	30	5
Minimum Underground Detention Volume (m <sup>3</sup> )	40	25
5 Year Peak Flow, Q <sub>5</sub> (m <sup>3</sup> /s)	0.032	0.070
5 Year Peak Flow, Q <sub>5</sub> (L/s)	32	70

The design proposes to mitigate the peak 5-year ARI flow increases caused by the additional impervious area by installation of underground detention tanks at each outlet (ie east catchment and the western catchment). These tanks are notionally sized to be 40m<sup>3</sup> for the new eastern catchment and 25m<sup>3</sup> for the existing western catchment.

Above ground detention swales or bioretention were initially considered but were subsequently deemed unfeasible due to space constraints and the need to preserve regulated and significant trees. Water Sensitive Urban Design (WSUD) proposed is in the eastern carpark where the median separator garden and landscape plantings will receive passive irrigation using kerb breaks.

In the absence of WSUD measures to assist managing water quality the stormwater infrastructure will include a proprietary treatment device (such a Gross Pollutant Trap (GPT) or oil / grit separator) installed prior to delivery to the 100m<sup>3</sup> detention tank that will receive run off from both the western and eastern carparks prior to release into the stormwater network.

## 7.10. Site contamination

### 7.10.1. Existing conditions

The site has been allocated to one Certificate of Title (CT 5065 / 83) since 1989, when smaller portions of land were purchased and consolidated by the State Transport Authority. The earliest available Certificates of Title were 1886, 1894, 1900, and 1911, when the site was comprised of multiple smaller parcels of land owned mainly by private owners. These private owners were predominately gardeners and horticulturalists.

The Aerial photography 1949 showed the site comprised of small-scale agricultural purposes.

In accordance with the PTPA PS&TR the project must provide to the Minister's Representative an Environment Site Assessment Report prepared by a site contamination consultant with reference to the 'National Environment Protection (Assessment of Site Contamination) Measure 2013' and the EPA Guideline 'Site Contamination:

Guidelines for the Assessment and Remediation of Groundwater Contamination updated February 2009'. In addition, objectives 8 and 9 and PDC 22 of the General Section Hazards and the Campbelltown City Development Plan, require in effect sites to be safe and appropriate to their intended use.

The Environment Site Assessment Report must provide definitive statements regarding site contamination the site does not pose unacceptable risk to human health and the environment taking into account the proposed use(s).



To meet this PS&TR requirement, the PTPA engaged Golder Associates Pty Ltd to undertake a review of analytical data from soil samples. A total of 23 soil bore locations (BH01-BH15 and HA01-HA08) which include 2 deep boreholes and 8 hand auger borehole locations, were utilised for this site contamination study and these can be viewed below in Figure 7.12.

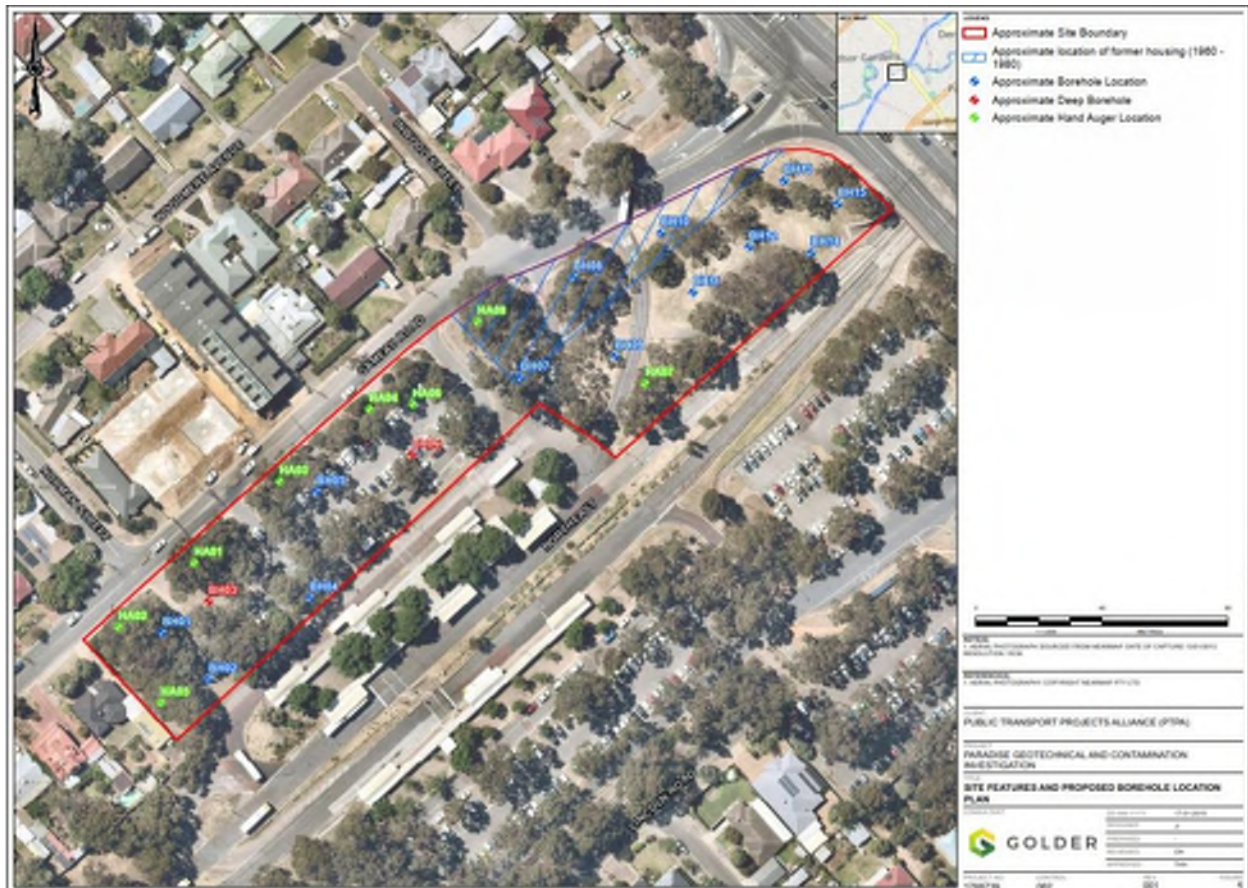


Figure 7.12: Location of boreholes within project area.

The site contamination investigations undertaken provide the following key findings:

- The samples tested containing soil concentrations with contaminants of interest were less than the adopted human health screening levels.
- Majority of soil concentrations of contaminants of interest in the samples tested were less than the adopted ecological health screening levels. With the exception of copper found in BH15 and TRH > C10-C16 in shallow fill at BH01 which exceeded the NEPM EIL guideline values.
- Boreholes BH01, BH03, BH04 show an exceedance of the waste fill limit with elevated concentrations of manganese and TRH in the south-western portion of the site. Also, in the eastern area of the site, in boreholes BH08 and BH15, there are elevated levels of copper, total PAH and chlordane. A statistical assessment across the entire set of testing results indicated the 95% upper confidence limit for manganese, TRH and total PAH would be compliant with the waste fill limit.

Should the subject soils require offsite disposal to an appropriately licensed waste facility;

- Fill materials in the vicinity of BH15 (extending to 1.0 m bgl) would be classified as Low-Level Contaminated Waste.
- Fill materials in the vicinity of BH08 (extending to 0.65 m bgl) would be classified as Low-Level Contaminated Waste.
- If fill materials in the vicinity of BH01, BH03 and BH04 are to be excavated from these portions of the site in isolation from the rest of the site, the waste classifications may be Intermediate Waste (BH03 and BH04) or Low-Level Contaminated Waste (BH01).

- Fill materials elsewhere across the site would be classified as Waste Fill.
- Natural soils across the entire site would be classified as Waste Fill.
- The materials may also be suitable for offsite reuse as Wasted Derived Fill (WDF). Waste Fill compliant soils can be reused as WDF at a non-sensitive land use site. Reuse of Intermediate Waste Soils as WDF will also require a further approval by an EPA accredited Site Contamination Auditor. For further details regarding reuse of materials as WDF can be found in the *Standard for the production and use of Waste Derived Fill* (EPA 2013).

#### 7.10.2 Construction impacts and mitigation

The project has been designed to reduce the amount of contaminated material requiring excavation. Materials to be excavated will consist of concrete, bitumen and fill; those materials up to 0.8 metres in depth.

Construction Activities have the potential to create additional contamination through escape of contaminants including fuel and oils from equipment involved in the construction. The importation of contaminated material could also occur. The following measures will be implemented to avoid additional contamination:

- Any spills of contaminants from machinery will be immediately cleaned up.
- Spill kits will be retained at all work areas in case of contaminant escape.
- All equipment and vehicles will be maintained in good working order. Daily inspections will be performed to identify leaks. Records of inspections will be maintained on site. Any identified leaks shall be repaired immediately.
- Fuel, oil, lubricants and other chemicals will be stored on site in accordance with AS 1940, within a bund with an impervious floor and not in an area which is subject to flooding or is within 20 metres of a built drainage line.
- Unless double lined or internally banded, all stationary or mobile pumps, generators, lighting towers, etc. will be located within a bund with an impervious floor in accordance with the requirements of AS 1940.
- An environmental incident and emergency response plan will be developed and incorporated into the CEMP. This plan will detail measures for the prevention, containment and clean-up of accidental spills of fuels and chemicals.
- Records of any spill or emergency incidents and the response and corrective action that were implemented will be kept. Where a pollution incident potentially in breach of the *Environment Protection Act 1993* occurs the works crew will notify relevant authorities, including the EPA and DPTI immediately, and will undertake appropriate clean up and remediation and provide a copy of the emergency response record.
- Equipment and vehicles will be placed on hard standing for all repair work and fuelling. If the equipment cannot be moved, appropriate measures will be put in place to avoid escape of contaminants.
- The site will be kept in a clean and tidy condition at all times.
- Waste will be kept separated and segregated on-site, stored in an appropriate manner to prevent escape.
- Asbestos may be encountered or excavated within the project site during construction. A procedure to manage asbestos, should it be found will be included in the CEMP. Should asbestos be encountered within the site, the Client will be notified. Should any excavated soil be found to contain asbestos material, following all reasonable and practicable efforts to remove the asbestos, the soil will be disposed of to an appropriately licensed EPA facility.
- Training of construction staff on the identification and management of potential contamination issues.

### 7.10.3. Operational impacts and mitigation

The project will not change the land use of the site, therefore the risks associated with contamination are not considered to be materially different from the existing land use.

The design of the project will prevent users from coming into contact with soil; no contaminated unsealed ground will be accessible; clean fill will be used for all landscape planting. The focus of any potential impact would be on maintenance activities that may require excavation of the ground.

## 7.11. Heritage

The following section outlines the heritage assessment for the project.

### 7.11.1. Aboriginal Heritage

Independent Heritage Consultants (IHC) undertook a Desktop Heritage Assessment for the site in March 2019. Based on a review of the current available information, IHC has assigned a 'low' heritage risk for development activities carried out in previously disturbed soils and a 'moderate' heritage risk for those conducted in natural soils.

IHC provided the following options for the PTP Alliance to manage their heritage requirements under the relevant South Australian heritage protection legislation:

- The Alliance may choose to mitigate project heritage risk by implementing a site discovery procedure for any unexpected finds
- The Alliance should ensure heritage is addressed in their construction management plan and all workers are aware of the heritage risks and how to manage them (site inductions).
- The Alliance may wish to engage an archaeologist on call to assist in identifying any unexpected heritage items found by site works.
- It is well established that waterways have a generalised cultural significance for Aboriginal people. However, the proposed works are contained within a previously developed area and are unlikely to further disturb the adjacent River Torrens and associated environs.

### 7.11.2. Native Title

The project site is contained entirely within the determination area Kaurna Peoples Native Title Claim Area (Determination Area). In March 2018, the Federal Court provided a ruling on the Kaurna Peoples Native Title Claim Area, which determined that native title exists (Native Title Land) at seventeen parcels of land within the Determination Area (<http://www.judgments.fedcourt.gov.au/judgments/Judgments/fca/single/2018/2018fca0358>). None of the sites are within the Campbelltown City Council Local Government Area and as a result the project area does not encroach on any of the designated Native Title Land that will be impacted/modified by this project.

### 7.11.3. Non Aboriginal Heritage

A search of National, State, Local and contributory heritage items has been undertaken for the site and area surrounding the site. Local Contributory item #7928 located at 1 Lorraine Avenue Paradise is several streets north of Gameau Road and is not in close proximity to the site or access to the site.

As a result, no construction nor operational impacts are anticipated, and no specific site mitigation measures have been identified as being required for the site, other than compliance with general provisions of the *Heritage Places Act 1993* in relation to Non-Aboriginal Heritage.



## 8. ASSESSMENT AGAINST PROVISION OF CAMPBELLTOWN COUNCIL DEVELOPMENT PLAN

### 8.1. Procedural Matters

#### 8.1.1. Requirement for an application for Development Approval

This application is a reconfiguration and expansion of the car park on the northern side of the Paradise O' Bahn interchange. This includes the construction of a deck over a reconfigured existing car park, and the construction of additional car parking to the east. This additional parking will be at grade and open and necessitates a retaining wall to the east. Tree damaging activities will affect Regulated/Regulated Significant trees. In addition to the reconfigured car parking, pedestrian and carpark access will be upgraded, cycle parking provided and the site landscaped.

The land is owned by the Commissioner of Highways. Section 20(5) of the *Highways Act 1926*, provides the *Development Act 1993* does not apply to land which has been acquired by the Commissioner of Highways pursuant to Section 20.

The proposed development would appear also to fit the definition of roadworks pursuant to the *Highways Act, 1926* which includes at Section 7 that roadworks include:

- (e) the installation of fences, railings, barriers or gates; and
- (ha) the construction of buildings of facilities relating to public transport or parking for users of public transport.

Beyond this the section includes a range of other improvements to a road, including the installation of amenities or equipment on or adjacent to a road for the use, enjoyment or protection of the public, landscaping, drainage and any other works in connection with a road.

Tree damaging activities are development pursuant to the *Development Act 1993*. Damage to a regulated tree on land on which a road is located or proposed to be built or widened and that is under the care and control of the Commissioner for Highways is exempt from Development Approval pursuant to Schedule 14, 1(1)(v)(ii) of the *Development Act 1993*. The intention of this clause seems to be to exempt tree damaging activities in relation to road projects on Commission controlled land.

There is some conjecture as to whether or not the O-Bahn itself is a road (refer definitions from the *Highways Act 1926* in Attachment 6) and the juxtaposition of the site abutting Darley Road is an additional complexion. It could be considered there is an argument to suggest that approval pursuant to the *Development Act 1993* is not required.

Given this conjecture, and for reasons of transparency a decision has been made to seek approval pursuant to Section 49 of the *Development Act 1993* for the project as alterations and additions to the northern car park resulting in provision of 447 parking spaces comprising of:

- A single-deck parking structure over the existing Gameau Road at-grade car park site comprising a total of 306 parking spaces (151 spaces on ground level and 155 spaces on the deck level), and
- An additional at-grade car park on the vacant land on the corner of Gameau Road and Darley Road, comprising 141 parking spaces.

In addition, the project will reconfigure access and egress, pedestrian and cycling access paths, cycle facilities, landscaping and undertake tree damaging activities.

#### 8.1.2. Authority

The Minister is the Planning Authority pursuant to Section 49. The State Commission Assessment Panel is required to provide advice to the Minister.

#### 8.1.3. Nature of Development

Upgrading existing parking capacity, reconfigured access and egress, pedestrian and cycling access paths, cycle facilities, landscaping and tree damaging activities.

#### 8.1.4. Public Notification

Pursuant to Section 49(7d) of the *Development Act 1993*, development which will cost in excess of \$4 million to undertake, warrants public notification.

#### 8.2. Provisions

Pursuant to the current Development Plan the subject land falls within:

- Suburban Activity Node Zone

Moreover, the site is subject to Overlay Maps:

- Affordable Housing Designated Area
- Noise and Air Emissions

The subject site is wholly within the Suburban Activity Node zone and is covered by the Affordable Housing Overlay and Noise and Air Emissions, pursuant to overlay maps Cam/2 (Attachment 7). The site interfaces with the Residential Zone, the site is not covered by a Policy Area.

For referencing, the relevant development plan provisions have been attached to this report, forming Attachment 7.

##### **Suburban Activity Node Zone**

Pursuant to the Campbelltown City Council Development Plan (16 January 2018 consolidation), the subject site is wholly contained within the Suburban Activity Node Zone. In addition to the general provisions, the proposal is also subject to assessment against those provisions contained specifically within the Zone. Typically, these provisions are more specific.

The Suburban Activity Zone is a versatile zone which encourages the integration of mixed uses, including commercial and medium density residential development, within a central location. The zone typically contains a 'core area' accommodating more intense development and the 'transition area' which staggers development intensity to avoid interface impacts with other zones. The 'Core Area' as designated on Cam/3 – Suburban Activity Node Zone includes the subject site and allotments to the East, towards Darley Road.

The desired character envisages intensification of development on land located within the Core Area suggesting this will primarily be for the purposes of mixed use and will operate in conjunction with the Paradise interchange. It is anticipated that uses in the core area will vary and will be extended beyond normal working hours to enhance its vibrancy and safety by increasing the numbers of people and hours of occupation. Whilst there is a focus on pedestrian and cyclist connectivity in the desired character statement, the statement foreshadows development of multi-level parking to service the O-Bahn and surrounding area.

Across the zone it is anticipated that high amenity public realm and pedestrian environment will be achieved via landscaping, surface treatments, street furniture and building design. Footpaths will be wide and street trees will shade the footpath and soften the built form. Colonnades, courtyards, awnings and street furniture will create a pedestrian friendly environment. In alignment with the statement, a detailed landscape design has been prepared, which focuses on legibility and amenity of the site and surrounding pedestrian linkages.

The development is deemed to satisfy PDC 7 as the proposal is considered to be consistent with the overall intent of the desired character statement.

PDCs 4 and 5 call for development that is for non - residential purposes and promotes the use of public transport nodes. The intent of the project is to encourage the use of bus services as a viable means of commute.

Furthermore, the design of the carpark structure aligns with the zone policies, by not exceeding 3 stories in height, in accord with PDC 10, by being visually permeable and in accord with PDC12 by being consistent with the setback parameters detailed in PDCs 13,14 and 15.

PDCs 16, 17, 18, 19 and 20 deal with buildings exceeding 3 storeys, development adjacent linear park, masonry fencing, and land division therefore are not deemed applicable to the assessment of this development.

The development is considered to satisfy the zone provisions.

#### 8.2.1.1. Overlay - Affordable Housing Designated Area

Whilst the subject site is affected by the Affordable Housing overlay the nature of the proposal is not for the purposes of housing development. Therefore, an assessment of the overlay policies was not considered necessary for the purposes of this report.

#### 8.2.1.2. Overlay - Noise and Air Emissions

The subject land has been identified as a 'designated area' on the Noise and Air Emissions overlay and is therefore subject to the specific provisions.

Whilst the overall land use is not to change, it is acknowledged that the development will increase the use of the site. A noise impact assessment has been undertaken as part of the project.

The Environmental Protection (Noise) Policy 2007 outlines goal noise levels based on land use, for the Suburban Neighbourhood Zone and dwellings within a Residential Zone average noise levels between 7am and 10pm should be in the order of 50 dB(A); noise levels between 10pm and 7am should average at 43 dB(A).

The Environmental Protection (Noise) Policy 2007 also designates, that where existing noise levels within the environment intermittently exceeds 60 dB(A), the maximum noise level from development should not exceed this level. The baseline noise monitoring found that night time noise levels at the site intermittently reached 78dB(A), this level was therefore considered an appropriate maximum to inform an assessment of the development.

An assessment of the development was undertaken, factoring in potential variables. The assessment found that projected noise levels between 7am and 10 pm would approximate at 43 dB(A), while noise levels between 10pm and 7pm would be in the order of 38 dB(A) and reaching a maximum of 64 dB(A).

In summary, the development is anticipated to project less than maximum decibel levels outlined within the Environmental Protection (Noise) Policy 2007 therefore attenuation measures will not be warranted.

### 8.3. General Section

The proposed development has been reviewed against the General Section chapters of the Development Plan, in addition to the relevant zone policies. The relevant General Section chapters are considered as follows:

- Crime Prevention;
- Design and Appearance;
- Energy Efficiency;
- Hazards;
- Infrastructure;
- Interface between Land Uses;
- Landscaping Fences and Walls;
- Natural Resources
- Orderly and Sustainable Development;
- Siting and Visibility; and
- Transportation and Access

#### 8.3.1. Crime Prevention

In accordance with Objective 1, the development is anticipated to improve the safety of the area by increasing the number of people who use the space. The provision of additional car parks aims to encourage the use of public transport by offering parking. In activating the space, the development will assist in discouraging criminal behaviour.

The car park structure will be one deck above ground (approximately 3.5 m) and has been designed to be semi-open in nature, assisting in passive surveillance. However, the retention of some existing vegetation, new plantings as part of the landscape plan and road separation will minimise intrusion on privacy. The carparking deck will be constructed using robust materials (concrete and metal) that are difficult to damage and can be easily replaced. The proposed new lighting will allow for improved visibility both into the site and externally (PDC1, PDC2, PDC4, PDC5).

In accordance with PDC 6 a detailed landscaping plan has been submitted as part of this application and forms Appendix 8. The plan shows the proposed planting schedule for trees, shrubbery and groundcovers. Shrub



planting will be limited to avoid concealment locations and positioned away from footpaths/ cycle paths. Groundcovers are to be positioned along footpaths to improve legibility and sight lines whilst canopy trees will be adequately spaced, limiting concealment locations.

The development is deemed to have sufficiently addressed crime prevention policies by virtue of delivering a visibly permeable structure and landscape planning.

### 8.3.2 Design and Appearance

The proposed development is comprised of two core components: the construction of additional new at grade carparking and a single-story deck car park. In the early design phases of the development the Government Architect's office (ODASA) was engaged to provide comment on the proposal. Refinements have since been made in accordance with Design and Appearance Objective 2 and feedback received from ODASA. The location of the structure will be positioned on the footprint of the existing at grade car park, utilizing existing pathways and entry/exit points so the space can be still understood and easily navigated.

The deck is a single deck above the existing carpark and thus forms a double storey semi open structure. Steel mesh cladding will wrap around the northern and western facades of the structure, creating a physical barrier for safety purposes and as an articulation mechanism, breaking up the lineal form of the structure (PDC 14). Furthermore, the mesh cladding will assist in screening / buffering from the residences adjacent the site but will be permeable enough so as not undermine casual surveillance. The mesh cladding will be non-reflective in accordance with PDC 3. The proposed landscaping is anticipated to assist in softening the built form, as the landscape plan depicts, 7 trees are proposed to be planted along the Gameau frontage in front of the new single level deck. At maturity these *Corymbia maculate* are anticipated to measure in the order of 15-20m. This height can be compared to the deck structure which will be a maximum of approximately 6m from natural ground level (this includes the 3.5m deck height and a maximum height of the outside façade treatment of approximately 4m of the total 6m structure height).

Due to the orientation of the site, vegetation (existing and proposed) and the separation created by Gameau Road, the development will not intrude upon the privacy of neighbouring residences (PDC10, PDC 11). An effort has been made to limit the visual bulk of the structure by incorporating both horizontal and vertical elements, and thus breaking up the lineal basis of the deck (PDC1). PDC 12 envisages that development will primarily address Gameau. Whilst this PDC is considered to be more applicable to a building rather than a car park structure, which is more open in nature, the proposal is nonetheless consistent with this provision in that the main entry and exit locations are from Gameau Road.

PDC 5 provides development should incorporate balconies integrated with the overall design of the building, including balustrades and adequate drainage. Although the development does not incorporate balcony components, it is considered to address PDC 5 as the deck will provide an inclusion of impervious outer cladding that enables line of sight to the street; improving casual surveillance. It will be self-draining and plumbed to manage runoff appropriately and will not offend any principles dealing with runoff or drainage in this respect.

Appendix 8 contains the proposed landscaping plan for the overall site. It is anticipated that the additional plantings will offset some of the necessary tree removals required to undertake the project. Furthermore, landscaping is intended to emphasize pedestrian and cyclist links whilst improving the overall amenity of the site (PDC 13, PDC 15). The new at grade carpark component will be appropriately landscaped to ensure a high quality of visual amenity and to assist with legibility of the new space. Landscaping will be undertaken having regard for the need to provide for good sight lines and safety in accord with the principles of Crime Prevention through Environmental Design.

The development is considered to adequately address the Design and Appearance policies by incorporating various materials and vertical and horizontal elements in the design of the built form. Provision of landscaping will improve the overall amenity of the site and contribute to local biodiversity without compromising safety.

### 8.3.3. Hazards

The subject site is not within a designated flood zone or bushfire area under the current Development Plan (consolidated 16 January 2018) therefore policies concerned with these hazards are not deemed relevant in respect of this assessment.

Site testing undertaken by Golder has identified contaminants on some portions of the site, attributable to previous uses of the site and the introduction of fill at various times in the site's history. The detailed contamination assessment has been appended to this document and forms Attachment 10. As the report discusses, the primary contaminants identified were manganese and copper. However, the investigations find that neither exceed leachability criterion. No asbestos containing materials were detected. As the development will not of itself change the nature of the use, rather being for the purpose of alterations and additions, and the use is one of a transient nature, in that people park cars on the site and then leave the site (ie people use the site for a specific purpose and are not on the site for extended periods), the identified contaminants are not likely to pose a risk to public health and safety.

In cases where site contamination has been identified or is suspected to have occurred, based on an appropriate assessment, Objectives 8, 9 and 10 envisage the resultant development will protect human health and the environment. Furthermore, these provisions anticipate that where necessary, remediation of site contamination should be undertaken to ensure land is suitable for the proposed use and provides a safe and healthy, living and working environment.

The findings of the environmental analysis report indicate the land is suitable for expansion of the existing use (PDC22).

The Development Plan further envisages that development should minimise harm to life, property and the environment through appropriate location and the appropriate storage, containment and handling of hazardous materials. The proposed development does not include storage of materials and is considered to be consistent with Development Plan policy Objective 10, and PDCs 23 and 24.

Overall, the proposed upgrade to the existing carpark are considered to satisfy the Hazard policies outlined in the Development Plan in that an appropriate assessment of the site conditions has been undertaken and this has revealed that the nature and extent of identified contaminants are not likely to pose risk to human health and safety due to the nature of the proposed land use which is not considered to be a sensitive land use.

### 8.3.4. Infrastructure

In accordance with the general infrastructure Objectives 1,2 and 3, the Paradise Park 'n' Ride upgrade will provide additional infrastructure to the locality, using land already used for such that is owned by the Commissioner of Highways. The majority of the development will be undertaken within the footprint of the existing at grade car park facility in order to optimize the use of the existing car park site and thereby minimise the need for additional land dedicated to infrastructure provision. Furthermore, as the land has been used for the purposes of carparking for an extended period of time, the development is not considered to be inappropriate or likely to be detrimental to the amenity of the locality. With this in mind, the upgrade of the site provides an opportunity to improve upon the existing amenity through provision of new landscaping. New landscaping will incorporate a mixture of native groundcovers, shrubs and canopy trees in conjunction with the retention of existing vegetation to improve the site's amenity and preserve local ecology in accord with PDC10.

Pursuant to PDCs 1,3,5 and 8 the site is adequately serviced by water, sewer, stormwater and electrical services. The development will warrant an upgrade of the drainage system on the site which at present is comprised of two catchments to the East and West of the site. Both catchments drain into a 600mm drain via reinforced concrete pipes (RCPs) connected by pits and junctions which subsequently discharge into the River Torrens. Due to the increase in impervious space an amended stormwater management scheme has been designed to manage the increased flow rates. In summary, the proposal for stormwater management is as follows: continue to capture stormwater from the existing outlets, store and treat in two detention tanks notionally measuring at 40m<sup>3</sup> in the eastern catchment and 25m<sup>3</sup> in the western catchment and discharge treated water at a controlled rate to the River Torrens.

Full details of the design are included as Attachment 11 of this document.

Pursuant to PDCs 11 and 12, the development is proposed on appropriately zoned land and has been designed with the intent to limit disturbance to neighbouring uses.

PDC's 6,7,9,13,14,15 and 16 deal with development on sites which are not adequately serviced by water and electricity infrastructure. As the site is serviced, the provisions are not considered to be applicable in relation to this development proposal.

### 8.3.5. Interface Between Land Uses

In accordance with Objectives 1 and 3 the development is proposed on land which has been historically used as a carpark and bus interchange. The intent of the proposal is to improve the operation of the facility and in particular reduce car parking on surrounding roads. Efforts have been made through the design phase to further incorporate measures to minimise potential offsite, including landscaping to soften the appearance of the site and improve microclimatic conditions and structure design to provide interest, allow passive surveillance over public spaces but prevent overlooking (PDCs 2,3,4,5, and 6).

Pursuant to PDC1, noise and air assessments, light spill assessments and traffic assessments have been undertaken to identify potential offsite impacts which could potentially result from the development and includes reasonable and practicable recommendations for mitigation where it should be considered required.

In alignment with PDCs 7 and 8 a noise assessment undertaken indicates that the projected noise levels post development will not exceed the acceptable Environmental Protection (Noise) Policy 2007 standards, therefore no noise mitigation will be necessary.

PDCs 9, 10, 11 and 12 address issues pertaining to entertainment venues and restaurants. As the proposal does not incorporate development of this form these provisions are not considered to be relevant to an assessment of the proposed development.

On the basis of the zoning, ongoing use of the land and findings of the attached specialist reports, the proposed carpark upgrade is not anticipated to conflict with adjoining residential uses. It is anticipated that the upgrade of this facility should contribute to improving the carparking concerns by providing additional off-street car parking.

### 8.3.6. Landscaping Fences and Walls

Aspect (a landscape architecture consultancy) form part of the project team and have been responsible for delivering a quality landscape design, which has been fundamentally integrated into the development proposal. This design seeks to improve the existing amenity of the site whilst protecting the local ecology (Objective 1) by incorporating native tree and shrub species such as *Eucalyptus leucoxylon*, *Corymbia maculata* *Koelreuteria paniculata* and *Corymbia citriodora* which will accommodate perching and nesting for local fauna and will not introduce pest or weed species to the site. The landscape plan (refer to site context landscape plan in Figure 6.10) illustrates the landscaping solution and plant species to deliver an attractive space when viewed both internally and externally. It is intended that the investment in new plantings, paired with retention of existing vegetation will provide an attractive space which will soften/ screen the built form and new open car parking areas. Plantings will also act to provide shade for new pedestrian links and improve the buffer between the interfacing residential sites (PDC 1 and 2).

PDC3 seeks for landscaping to not unduly shade neighbouring properties. The closest neighbouring properties are located in the order of 20m from the site. Residences to the west are separated from the subject land by Gameau Road and are buffered by the existing planted mound. Given the distance and orientation to neighbouring properties and the spatial location, solar access is not considered to be impacted by the development. The proposed landscaping is not likely to restrict solar access to neighbouring properties due to the separation distance between sites and extent of tree canopies. The species selected do not have invasive root systems and therefore are considered to be unlikely to cause damage to structures or footpaths. The site is not located in a bushfire protection area and thus will not offend policy in this respect. The site is not directly adjacent a waterway and therefore is unlikely to increase leaf fall into a waterway.



The design has specifically been selected to allow for safe combined pedestrian, cyclist and vehicular movement through the space that will not limit sight lines or passive surveillance. The proposal therefore meets PDCs in relation to crime prevention through environmental design (CPTED).

Cox Architects have been responsible for the design of the carpark deck structure as depicted in Attachment 11. In order to limit the visual bulk of the structure, an open design has been selected, incorporating steel mesh screening for, privacy and visual interest via articulation (PDC 4). Retaining walls of up to 2m on the western carpark to retain the back of the existing vegetated mound and 3 meters on the eastern carpark to enable a minimum grade carpark in that location.

A number of design reviews have occurred to ensure that tree removal is minimised to optimise the aesthetics and visual amenity provided by the existing vegetation on site. No trees on neighbouring properties will be impacted as a result of the development.

The deck structure has a primary address to Gameau Road and a singular access and egress point for legibility. The open nature and additional level will assist in casual surveillance but will not impinge upon privacy of neighbouring sites.

PDC5 relates to front fencing and is not considered to be relevant to an assessment of this proposal, given that front fencing is not proposed as part of the development. Galvanised mesh fencing, approximately 1.2m high in the current style constructed at the interchange is included in the design along the shared use pathways adjacent to the bus in and out roads to direct pedestrians and cyclists to safe crossing points at that location of the site.

The engagement of Aspect and Cox is ongoing and ensures the upgrade works will be of a high design standard that does not compromise the amenity of the site and locality.

#### **8.3.7. Natural Resources**

EBS was engaged to undertake a fauna assessment as part of the project. The report describing the findings of this assessment is appended to this document Attachment 12. The assessment identified the possibility for one nationally threatened, one State threatened, and six regionally threatened species to be potentially inhabiting trees on the site. The most important tree species to threatened fauna within the project area were identified as *Euclayptus* and *Corymbia* species, as they provided resting and foraging stratum. Whilst trees of these species require removal to accommodate the carpark the landscaping proposal for the development will include the planting of a mixture of canopy trees that include these species and will provide a suitable habitat for the species identified. This assessment concludes the development aims to limit impact on local fauna species and this accords appropriately with Objective 8, and PDCs 26, 27, 28, 29, 30, 31, and 32.

WSUD has been considered. Consultation with Council is scheduled (Objective 4, 5, 6 PDC's 5-16). Due to limited space WSUD features will be primarily through kerb breaks in the eastern carpark to enable pre-treatment and watering of amenity planted trees

Cut/ Fill balances have not been finalised for the project (Objective 10, 11 PDCS 36-39)

PDCs 23, 24, 25, 34 and 35 relate to dams and horticulture development and are not considered to be applicable to and assessment of this project.

#### **8.3.8. Orderly and Sustainable Development**

In alignment with Objectives 1 and 2 which seek development to create pleasant environments and the economic provision of infrastructure. The development aims to encourage the use of the public transport by improving and adding to the existing at grade park 'n' ride facility, also aligning with PDC 3.

Objectives 3, 4 and 6 contemplate development to be undertaken on appropriately zoned land and located so as to not encroach upon existing uses; the development is proposed to be wholly undertaken on land which has been used as a carparking facility for a considerable period of time and has historically interfaced with the adjacent residences. The development upholds the intent of the desired character statement for the Suburban Activity Node Zone and is considered to be consistent with Concept Plan Map Cam/3 and PDC's 5, 7 and 8.

In accordance with PDC 7 the development aims to optimise the use of the current land and to support the projected development of other site's located within the Suburban Activity Node 'Core Area' depicted on the Concept Plan, Concept Plan Map - Cam/3.

Objective 5 and PDCs 2 and 4 are not considered to be applicable to the development given that the subject land does not directly abut a different local government area and is wholly within the metropolitan area.

The development satisfies the majority of sustainable development policies and objectives included in the Development Plan.

### 8.3.9. Regulated Trees

Notwithstanding Schedule 14(4)(b)(vii)(B) of the *Development Regulations 2008*, the development has made a reasonable and practicable attempt to retain existing regulated trees (and minimise construction and operational impacts) during the design process as summarised in the Section 6.2.6 of this document.

To summarise, the project seeks approval to:

- Remove 6 Regulated trees (tree numbers R7, R17, R33, R44, R101, R122) due to an Arborist recommendation to mitigate safety hazards or being located either immediately adjacent the single deck carpark structure or directly beneath the footprint where there is a significant impact to the tree protection zone (for more detail refer to Table 6.3 below).
- Remove an additional Regulated tree (tree number R11) due to the full extent of the cumulative impact of root damage and surface elevation differences will not be known until construction commences. The species has a low tolerance to disturbance. The project seeks approval to remove this tree but will continue to pursue retention of the tree into construction and to operation (refer to Table 6.4)
- Tree damaging activities in the form of minor canopy and root impacts to 1 Regulated (R58) and 1 Regulated Significant (S28). Tree R58 may require removal of one lower branch for vehicle clearance under the new single deck ramp and potentially minor root impacts at a portion of the outer extent of the tree protection zone. Tree S28 may also require removal of one lower branch for heavy vehicle clearance on Gameau Road and potentially minor root impacts at a portion of the outer extent of the tree protection zone to enable construction of the bus in road. (Refer to Table 6.4).
- Tree damaging activities in the form of minor root impacts to the southern outer extent of the tree protection zone of 1 Regulated Significant tree (S127) to enable construction of the western carpark.

### Offset requirement for Regulated tree removal

In accordance with the *Development Act 1993* a 2:1 offset applies to Regulated trees and a 3:1 offset applies to Regulated significant trees. If it is not feasible to provide replacement plantings on-ground, a payment in accordance with the gazetted Development Application Fees may be made into the Planning and Development Fund. From 1<sup>st</sup> of July 2016, the fee is set at \$89.50 (GST exempt) per tree (i.e. 2:1 or \$179 for removing a regulated tree; 3:1 or \$268.50 for removing a significant tree).

The offset for removal of *up to* seven (7) Regulated trees is fourteen (14) trees. Refer to Table 8.1 below.

**Table 8.1: Regulated and Regulated Significant tree offsets**

Tree number removed	Legislation Status	Offset Required	Offset/Fund Payment
7	Regulated	2:1, total of 14 trees	Offset by 14 trees in the projects landscape plan
0	Significant	3:1, total of 0 trees	NA

### 8.3.10 Siting and Visibility

The proposed car park building is to be constructed on the same site as the bus interchange, which is a relatively flat portion of land. Its siting will not be prominent in the landscape nor will it undermine the aesthetics of the locality. The deck structure has been specially designed to adopt open components, incorporate varying vertical and horizontal elements to provide articulation and interest, and has been limited to a single deck structure to avoid causing streetscape amenity impacts and will be complimented with landscaping, thus the proposal is considered to accord with PDCs 2 and 4 which seek development that will not be detrimental to streetscape amenity and provision of vegetative screening.

PDCs 2 and 8 call for development which will be adequately screened and positioned when viewed from public roads. The proposal will be setback from approximately 7m of the site frontage (Gameau Road), will have permeable cladding on the single deck, retention of some existing vegetation which, in conjunction with new landscaping will assist in screening the structure from both Darley Road and Gameau Road. The proposal is therefore considered to accord with these policies. New plantings have also been spatially positioned and the species specifically selected to assist with wayfinding, and to improve the amenity of the new and existing pedestrian links by offering shade, improving the microclimate of the site and adding a softening to the environment generally.

Objective 1 and PDCs 1, 3, and 6 discourage development which is likely to impinge upon scenic routes and areas in attractive landscapes – due to the location of the subject site and association with the O-Bahn the provisions are not considered relevant to an assessment of this proposal.

### 8.3.11 Transportation and Access

Objectives 1 and 2 speak to development which will uphold and assist existing and new transport connections by sympathetically integrating between nodes. Development for the purposes of transport is envisaged to play an essential role in the efficiency of the State's economy and attract and provide for of further development and employment. The proposed upgrade aims to facilitate and encourage the use of the bus interchange by providing parking for commuters. The upgrades will include pedestrian link upgrades and surface treatments as well as cyclist link upgrades and additions to bike storage facilities to cater for commuters using active transport modes which is considered to accord with Objective 4, and PDCs 8, and 10 that speak to pedestrian movement and permeability.

The subject site is currently being used as a transport interchange. By upgrading this existing facility and using a small portion of the balance of the land adjacent the O'Bahn that in effect already forms part of this infrastructure facility, the development will not require acquisition of further land and does not impact any land that could serve a better community purpose as per Objective 2. The zoning and use of existing land will avoid encroachment to the ongoing and future uses of adjoining land and suitably connects the site to Darley Road, which is identified as a Strategic Transport Route on Cam/2 (PDC1, 2). An existing sealed path connects cyclists and pedestrians with the River Torrens Linear Park which incorporates both cycle and walking paths to external locations, the interchange and Darley Road. The upgrades to the interchange will ensure the space is permeable for both cyclists and pedestrians and will incorporate new bike storage facilities within the interchange to facilitate a multi-modal commute. The proposal is considered to accord with the provisions of PDCs 15, 16, 17, 18, 19, 20, 21 and, 29 that talk to pedestrian and cyclist movement.

Both Gameau and Darley roads are sealed roads with direct access into the site being from Gameau Road via multiple established access points. Access points are clearly marked to differentiate between bus and car access points. Access and egress into the carparks will be maintained from Gameau road and vehicle manoeuvring allowed for on- site to ensure vehicles enter and exit in a forward motion. A new access point will be required in order to facilitate movement to eastern at grade carpark at the northern end of the site.

In accord with PDCs 22, 23, 24, 25, 26, and 28 an initial traffic assessment was undertaken on the 50% design, with a review and update currently underway for the 100% design. The initial assessment assessed traffic movements associated with the operation of the site taking into account current traffic levels and the projected increase and changes to traffic movements. The analysis has identified some current (pre project) trends that pose potential issues to commuters inside and outside of the interchange which offer the opportunity to be remedied, some of which appear to be beyond the scope of the project at this time. The assessment suggested measures could be undertaken to improve vehicular movement in, out and around the site including parking



restrictions on Darley Road, extension of the right-hand turn lane alteration to the existing left-hand turn space from Darley Road onto Gameau road and provision of ‘keep clear’ line marking on Gameau road to avoid queuing.

PDCs 30, 31, 32, 33, 34, 35, 36, 37 and 44 talk to development including car parking facilities. The development is for the purposes of improved parking provision and site amenity upgrades. The proposed improvements include an upgrade to the existing pedestrian and cyclist connections via new landscaping and surface treatments. Public realm rejuvenation and lighting will assist in wayfinding and safety for pedestrians and cyclists alike, making the space viable for use outside of daylight hours. Additional plantings will assist in screening and softening hardstand areas without compromising vehicle, pedestrian or cyclists sight lines. The development will implement a new stormwater management strategy to ensure the site is sufficiently drained, accounting for the overall increase in impervious surface area. Furthermore, carparks have been designed in accordance with the more recent Australian Standards to ensure the functionality and safety of the facility as well as the convenient connection to the bus interchange and other local transport routes. To this end, the proposal is considered to accord with the provisions of the Transportation and Access chapter.

PDCs 27, 38, 39, 40, 41, 42, 43, 45, 46, and 47 relate to residential, commercial and undercroft development and are not deemed applicable to the assessment of the proposed development.

On balance the development is considered to be consistent with policies concerned with transport and access – supported by the traffic impact assessment report and detailed site context landscape plan.

## 9. CONCLUSION

In conclusion, this application for the Paradise Park'n'Ride project is made pursuant to Section 49 of *the Development Act 1993*.

The project is seeking approval to:

- undertake works to construct additional carparking;
- remove up to seven (7) Regulated trees; and
- tree damaging activities in the form of minor canopy and potential root pruning to a portion of the outer extent of the tree protection zone to two (2) Regulated and one (1) Regulated Significant trees.

The project aims to increase the total parking space capacity at the Paradise O-Bahn interchange Park'n'Ride and is part of the O-Bahn Park'n'Ride Initiatives Project. Its design has been undertaken in as part of the North East Public Transport Study (NEPTS), part of the South Australian Government's commitment to invest significantly in a stronger public transport network by delivering increased connectivity, faster and more reliable travel and increased public transport use.

In addition to construction of additional carparking, the project will reconfigure access and egress, update existing pedestrian and cycle access paths, update cycle facilities and landscape ensuring it is sustainable and in keeping with the character of the area. To assist with connectivity and wayfinding there will be new lighting, pathway surfaces and fencing to increase safety and visibility ensuring a safe route to and from the Paradise O-Bahn bus interchange.

The development has been reviewed in relation to the following strategic documents; the 30-Year Plan for Greater Adelaide, the Integrated Transport and Land Use Plan, and the Campbelltown City Council – Towards 2020. The development has also undergone a design review by ODASA in relation to ODASA's Principles of Good Design. Furthermore, an assessment has been undertaken of the Campbelltown City Council Development Plan (consolidated 16th of January 2018), including a review against zone, policy area, overlay and general section chapters.

For the reasons outlined in this Planning Report, the proposed Paradise Park 'n' Ride project meets the intent of the Development Plan.

## 10. APPENDIX A

### Attachment 1: Certificate of Title





## Certificate of Title - Volume 5065 Folio 83

Parent Title(s) CT 4334/145

Creating Dealing(s) VM 7240401

Title Issued 09/03/1992

Edition 2

Edition Issued

24/11/1995

### Estate Type

FEE SIMPLE

### Registered Proprietor

COMMISSIONER OF HIGHWAYS  
OF ADELAIDE SA 5000

### Description of Land

ALLOTMENT 100 DEPOSITED PLAN 32043  
IN THE AREA NAMED PARADISE  
HUNDRED OF ADELAIDE

### Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B TO THE COUNCIL FOR THE AREA (T 2877969)

TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED D APPURTENANT ONLY TO THE LAND MARKED C

### Schedule of Dealings

NIL

### Notations

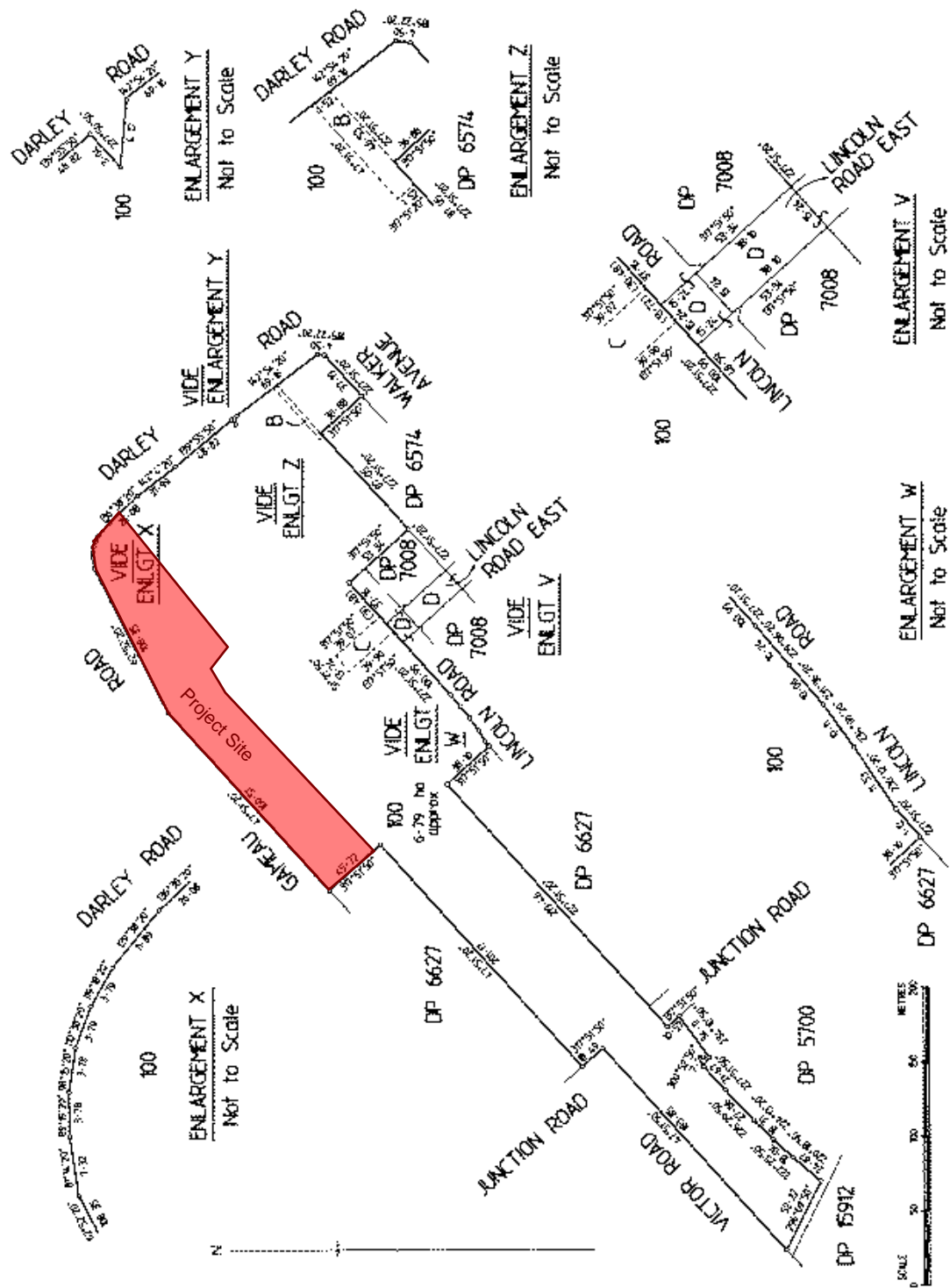
Dealings Affecting Title NIL

Priority Notices NIL

Notations on Plan NIL

Registrar-General's Notes NIL

Administrative Interests NIL



**Attachment 2: Arborman Tree Assessment Report (08/05/2019)**





# Preliminary Tree Assessment

Site: Paradise Park N Ride

Date: Monday, 17 June 2019  
ATS5360-ParadisePTA V3

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Report Reference Number: ATS5360-ParadisePTA V3

Report prepared for

Stephanie Matthews, Environment Approvals, PTPA

Author

Jason Williams, Consulting Arborist, Arborman Tree Solutions Pty Ltd

## Brief

Arborman Tree Solutions was engaged to undertake a Preliminary Tree Assessment at within the identified area of Paradise Park N Ride. The purpose of a Preliminary Tree Assessment is to evaluate tree retention suitability in a future development through the use of a Tree Retention Rating system.

In accordance with section 2.2 of the Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-2009) the following information is provided:

- Identification of the species of each tree and assessment of their health and structure.
- Identification of the Legislative Status of trees as defined within the *Development Act 1993* and the local development plan.
- Tree Retention Rating for each tree. The Tree Retention Rating has been applied to all trees regardless of legislative status.
- The identification of the Tree Protection Zone (TPZ) for each tree.

## Documents and Information Provided

The following information was provided for the preparation of this assessment

- Site Plan

## Executive Summary

Arborman Tree Solutions undertook a Preliminary Tree Assessment of all trees on the site with a height greater than five metres. The purpose of this assessment is to identify trees suitable for retention within a future development through the use of a Tree Retention Rating system.

A total of 131 trees were assessed and three were identified as Significant Trees, nine as Regulated Trees whilst the remaining 119 identified as unregulated trees under the *Development Act 1993*. There were also three vegetation groups (Trees 123-126) collected which consisted of *Myoporum parvifolium* and *Grevillea* species primarily.

A total of 100 trees have been identified as suitable for retention and 31 trees which do not warrant development constraint, alternative designs, or tree-friendly construction methodologies.

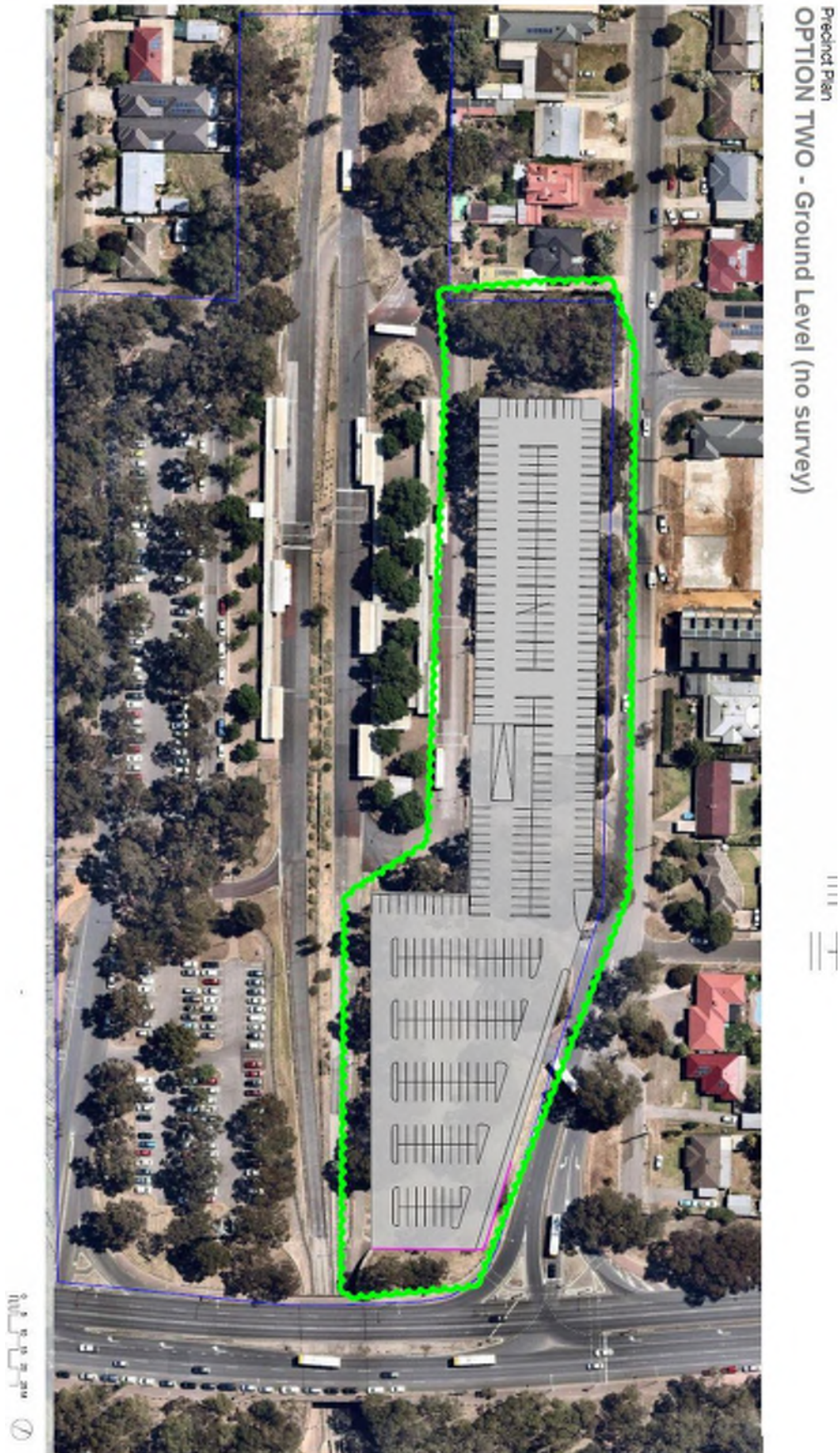
This assessment identifies:

1. There are 118 trees which are not subject to legislative control therefore tree damaging activity, including their removal if required, does not require a development application.
2. Tree 108, whilst unregulated, is an asset of the City of Campbelltown and therefore its protection is required in accordance with AS4970-2009.
3. Trees 7 and 17 Regulated Trees with a Low Retention Rating indicating that development constraint, alternative designs or tree friendly construction methodologies are not warranted. Removal of these trees as part of an otherwise reasonable and expected development should achieve approval from the local planning authority.
4. There are nine trees which are Regulated and/or Significant Trees with a Moderate Retention Rating indicating they should be considered for retention in a future development. Their removal may be approved if it can be demonstrated that they are restricting an otherwise reasonable and expected development and alternative design solutions are not available.
5. Tree 50 is a Regulated Tree with a High Retention Rating indicating it should be considered for retention in a future development. A High Retention Rated tree will in almost all cases achieve one of more the Principles of Development Control in the *Development Act 1993* that indicates its protection is required. Its removal is unlikely to be approved unless it can be strongly demonstrated that it is restricting an otherwise reasonable and expected development and alternative design solutions are not available.
6. Any Regulated or Significant Trees require written Development Approval prior to any tree damaging activity occurring. This includes activities within the TPZ, tree removal and may include pruning.
7. A Project Arborist should be appointed to assist in the design around trees to be retained; development impacts and tree protection requirements are to be included in a Development Impact Report and a Tree Protection Plan as identified in Australian Standard AS 4970 2009 *Protection of trees on development sites* (AS4970-2009).



## Site Location

Figure 1: Survey site location - Paradise Park N Ride



## Methodology

A site inspection was undertaken on Tuesday, 5 February 2019 and the 14<sup>th</sup> of June 2019. Trees were mapped using a Trimble Geo7X handheld and assigned a unique tree number. Individual tree findings were recorded using the Tree Assessment Form (TAF©). Tree Health Indicator (THI©), Tree Structure Assessment (TSA©) and Useful Life Expectancy (ULE), were assessed using the methodology described within Appendix A. Legislative Status was identified for all trees under the *Development Act 1993*.

Each tree's suitability for retention was determined by reviewing principles under the local development plan or relevant authority and applying these findings in the Tree Retention Rating (TRR©) method, as described within Appendix A. Tree Protection Zones were calculated using the Australian Standard AS4970-2009 (Section 3.2). Mapping was performed using GIS, CAD, and Civil 3D software.

*Limitations: Tree management options such as pruning, soil amelioration, pathogen treatment are not part of this report and should be considered in relation to any proposed development.*

*Note: This report is intended to provide preliminary advice to assist with determining scope for development. The City of Campbelltown may require further information to approve the removal of Significant or Regulated Trees.*

## Findings

### 1. Tree Population

The assessment identified 131 trees and the tree population included a variety of exotic, indigenous and Australian native species. The dominant species on site is *Corymbia maculata* (Spotted Gum) which accounts for almost 50% of the overall population.

Table 1 Tree Population

Botanic Name	Common Name	Number of Trees	Origin
<i>Corymbia maculata</i>	Spotted Gum	61	Native
<i>Corymbia citriodora</i>	Lemon Scented Gum	22	Native
<i>Eucalyptus leucoxylon</i>	South Australian Blue Gum	22	Indigenous
<i>Eucalyptus camaldulensis</i>	River Red Gum	14	Indigenous
<i>Fraxinus angustifolia</i> ssp. <i>angustifolia</i>	Desert Ash	7	Exotic
Group - Weed	Various	3	Weed
<i>Eucalyptus campaspe</i>	Silver Gimlet	1	Native
<i>Eucalyptus cladocalyx</i>	Sugar Gum	1	Native

Findings on individual tree health and structure are presented within Appendix B, Tree Assessment Findings.

### 2. Legislation

Of the trees assessed, three are Significant Trees and nine are Regulated Trees as defined under the *Development Act 1993*. The remaining 115 trees are unregulated. Tree 108 is an asset of the City of Campbelltown and therefore its protection is required in accordance with AS4970-2009 regardless of its legislative status. Significant and Regulated Trees should be protected if they meet the criteria under the local development plan.

Table 2 Legislative Tree Status

Legislative Status	Number of Trees
Unregulated	119
Significant	3
Regulated	9

**Regulated Tree:** a Regulated Tree is one which has a trunk circumference greater than two metres at one metre above ground level and is therefore subject to regulation under the *Development Act 1993* and therefore needs to be assessed against the relevant amenity and environmental criteria to determine its suitability for protection.

**Significant Tree:** a Significant Tree is one which has a trunk circumference greater than three metres at one metre above ground level and is therefore subject to regulation under the *Development Act 1993* as a Significant Tree and therefore needs to be assessed against the relevant amenity and environmental criteria to determine its suitability for protection. The protection of Significant Trees is generally considered to be of higher importance than Regulated Trees however this is not always the case.

Both Regulated and Significant Trees require a Development Application to be submitted to the local council for the approval of any tree damaging activity such as excavation in the root zone, tree removal and some forms of pruning.

**Unregulated Tree:** trees identified as unregulated are not subject to control under the *Development Act 1993*. Unregulated Trees may be pruned or removed without the need for a Development Application.

**Exempt Trees:** there are a number of potential reasons for a tree being exempt from control under the *Development Act 1993* including species, dead trees, proximity to a dwelling or swimming pool and/or in a bushfire prone area. Where trees have been identified as Exempt a note as to the reason has been recorded in the Table Assessment Summary (Appendix D).

### 3. Retention Rating

Trees that provide important environmental and/or aesthetic contribution to the area and are in good overall condition achieved an Important or High Retention Rating and their protection is encouraged. Trees that achieved a Moderate Retention Rating could be retained in a future development. Trees which achieved a Low Retention Rating indicate that development constraint, alternative designs or tree friendly construction methodologies are not warranted. Trees with a Low Retention Rating achieve one or more of the following attributes:-

- a) provide limited environmental/aesthetic benefits to the area,
- b) are a short-lived species,
- c) represent a material risk to people or property,
- d) identified as causing or threatening to cause substantial damage to a structure of value,
- e) have a short Useful Life Expectancy.
- f) are young and easily replaced (less than five metres tall).

A total of 100 trees are suitable for retention as they achieved a High (1) or Moderate (99) Retention Rating. The Regulated and Significant Trees that scored such a rating meet the criteria defined within the *Development Act 1993* that warrant retention.

Table 3 Retention Rating

Retention Rating	Number of Trees
High	1
Moderate	99
Low	31

The remaining 31 trees achieved a Low Retention Rating indicating that development constraint, alternative designs or tree-friendly construction methodologies are not warranted. As such, tree removal could be considered to achieve a future development (this includes Regulated/Significant Trees).

### 4. Tree Protection

Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-2009) prescribes the use of a Tree Protection Zone (TPZ) as the principle means of protecting trees throughout the development process. If encroachment is required within any TPZ, the Project Arborist should identify impacts and recommend mitigation measures. The Tree Protection Zones should be used to determine scope for development of the site by maintaining these areas as open space. The Tree Protection Zone radii are included within Appendix D Tree Assessment Summary.



## Recommendation

The following recommendations are presented based on the Preliminary Tree Assessment:

1. Trees that achieved a High Retention Rating should be retained.
2. Trees that achieved a Moderate Retention Rating could be considered for retention within a future development. The removal of Regulated or Significant trees may be approved if it can be demonstrated that they are restricting a reasonable and expected development and alternative design solutions are not available to retain them.
3. Trees that achieved a Low Retention Rating do not warrant development constraint, alternative designs, or tree friendly construction methodologies. As such, tree removal could be considered to achieve the development (this includes Regulated and Significant Trees).
4. Regulated and Significant Trees require Development Approval prior to any tree damaging activity occurring. This includes development activities within the TPZ, tree removal and potentially pruning.
5. A Project Arborist should be appointed to assist in the design around trees to be retained; the development impacts and tree protection requirements are to be included in a Development Impact Report and a Tree Protection Plan as identified in Australian Standard AS4970-2009 *Protection of trees on development sites*.

Thank you for the opportunity to provide this report. Should you require further information, please contact me and I will be happy to be of assistance.

Yours sincerely



**JASON WILLIAMS**

**Consulting Arboriculturist**

**Graduate Certificate in Arboriculture**

**Diploma of Arboriculture**

**International Society of Arboriculture – Tree Risk Assessment (TRAQ)**

**Quantified Tree Risk Assessment (QTRA) Licensee – 5775**

**Australian Arborist Tier 1 License AL-2703**

**Arbiculture Australia - Registered Consulting Arborist**

**VALID Tree Risk Assessment (VALID) – 2018**



## Glossary

<b>Size:</b>	approximate height and width of tree in metres.
<b>Age:</b>	identification of the maturity of the tree.
<b>Useful Life Expectancy:</b>	expected number of the years that the tree will remain alive and sound in its current location and/or continues to achieve the relevant Principles of Development Control.
<b>Health:</b>	visual assessment of tree health.
<b>Structure:</b>	visual assessment of tree structure.
<b>Circumference:</b>	trunk circumference measured at one metre above ground level. This measurement is used to determine the status of the tree in relation to the <i>Development Act 1993</i> .
<b>Diameter at Breast Height (DBH):</b>	trunk diameter measured at 1.4 metres above ground level used to determine the Tree Protection Zone as described in Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> .
<b>Diameter at Root Buttress (DRB):</b>	trunk diameter measured immediately above the root buttress as described in Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> and is used to determine the Structural Root Zone.
<b>Tree Damaging Activity</b>	Tree damaging activity includes those activities described within the <i>Development Act 1993</i> such as removal, killing, lopping, ringbarking, or topping or any other substantial damage such as mechanical or chemical damage, filling or cutting of soil within the TPZ. Can also include forms of pruning above and below the ground.
<b>Tree Protection Zone:</b>	area of root zone that should be protected to prevent substantial damage to the root system.
<b>Structural Root Zone:</b>	calculated area within the tree's root zone that is considered essential to maintain tree stability.
<b>Project Arborist</b>	A person with the responsibility for carrying out a tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The Project Arborist must be competent in arboriculture, having acquired through training, minimum Australian Qualification Framework (AQTF) Level 5, Diploma of Horticulture (Arboriculture) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this standard.

## References

Australian Standard AS4970–2009 ***Protection of trees on development sites***: Standards Australia.

Matheny N. Clark J. 1998: ***Trees and Development a Technical Guide to Preservation of Trees During Land Development***. International Society of Arboriculture, Champaign, Illinois, USA.

Dunster J.A., Smiley E.T., Metheny N. and Lilly S. 2013. ***Tree Risk Assessment Manual***. International Society of Arboriculture, Champaign, Illinois USA.

## Appendix A - Tree Assessment Methodology

## Tree Assessment Form (TAF©)

Record	Description
<b>Tree</b>	A perennial woody plant with a mature height of greater than 5 metres and life expectancy of more than 10 years.
<b>Genus and Species</b>	Trees are identified using normal field plant taxonomy techniques. Due to hybridisation and plant conditions available on the day of observation it may not always be possible to identify the tree to species level; where species cannot be ascertained <i>sp.</i> is used.
<b>Height</b>	Tree height is observed and recorded in the following ranges; <5m, 5-10m, 10-15m and >20m.
<b>Spread</b>	Crown width (projection) diameter is recorded by the following fields <5m, 5-10m, 10-15m, 15-20m, >20m.
<b>Tree Health</b>	Tree health was assessed using the Arborman Tree Solutions - Tree Health Assessment Method that is based on international best practice.
<b>Tree Structure</b>	Tree structure was assessed using Arborman Tree Solutions - Tree Structure Assessment Method that is based on international best practice.
<b>Tree Risk Assessment</b>	Trees were assessed using the International Society of Arboriculture Level 1 Tree Assessment method. The person conducting the assessment has acquired the International Society of Arboriculture Tree Risk Assessment Qualification (TRAQ).
<b>Legislative Status</b>	Legislation status was identified through the interpretation of the <i>Development Act 1993</i> , and the <i>Natural Resource Management Act 2004</i> as well as other relevant legislation, therefore determining regulatory status of the subject tree.
<b>Mitigation</b>	Measures to reduce tree risk may be recommended in the form of pruning and this listed in the Tree Assessment Findings (Appendix C). Tree pruning is recommended in accordance with AS4373-2007 <i>Pruning amenity trees</i> where practicable. Where measures to mitigate risk is not possible and the risk is unacceptable, then tree removal or further investigation is recommended.

## Useful Life Expectancy (ULE)

ULE Rating	Definition
Surpassed	The tree has surpassed its Useful Life Expectancy.
<10 years	The tree displays either or both Poor Health and/or Structure and is considered to have a short Useful Life Expectancy of less than ten years.
>10 years	The tree displays Fair Health or Structure and Good Health and Structure and is considered to have a Useful Life Expectancy of more than ten years.
>20 years	The tree displays Good Health and Structure and is considered to have an extended Useful Life Expectancy of more than twenty years.

## Maturity (Age)

Age Class	Definition
Senescent	The tree has surpassed its optimum growing period and is declining and/or reducing in size. May be considered as a veteran in relation to its ongoing management. Tree will have generally reached greater than 80% of its expected life expectancy.
Mature	A tree which has reached full maturity in terms of its predicted life expectancy and size, the tree is still active and experiencing cell division. Tree will have generally reached 20-80% of its expected life expectancy.
Semi Mature	A tree which has established, but has not yet reached maturity. Normally tree establishment practices such as watering will have ceased. Tree will generally not have reached 20% of its expected life expectancy.
Juvenile	A newly planted tree or one which is not yet established in the landscape. Tree establishment practices such as regular watering will still be in place. Tree will generally be a newly planted specimen up to five years old; this may be species dependant.



## Tree Health Indication (THI©)

Category	Description
Good	Tree displays high vigour, uniform leaf colour, no or little dieback (<5%), crown density (>85%) and or healthy axillary buds and typical internode length. The tree has little to no pest and/or disease infestation.
Fair	Tree displays low vigour, dull leaf colour, little dieback (<15%), crown density (>70%) and/or reduced axillary buds and internode length. Minor pest and/or disease infestation potentially impacting on tree health.
Poor	Tree displays no vigour, chlorotic or dull leaf colour, moderate to high crown dieback (>15%), low crown density (<70%) and/or few or small axillary buds and shortened internode length. Pest and or disease infestation is evident and/or widespread.
Dead	The tree has died and has no opportunity for recovery.

## Tree Structural Assessment (TSA©)

Category	Description
Good	Little to no branch failure observed within the crown, well-formed unions, no included bark, good branch and trunk taper present, root buttressing and root plate are typical.
Fair	History of minor branch failure observed in crown, well-formed unions, no included bark, acceptable branch and trunk taper present, root buttressing and root plate are typical.
Poor	History of significant branch failure observed in crown, poorly formed unions, included bark present, branch and trunk taper absent, root buttressing and root plate are atypical.
Failed	The structure of the tree has or is in the process of collapsing.

## Tree Retention Rating (TRR)

The Tree Retention Rating is based on a number of factors that are identified as part of the standard tree assessment criteria including Condition, Size, Environmental, Amenity and Special Values. These factors are combined in a number of matrices to provide a Preliminary Tree Retention Rating and a Tree Retention Rating Modifier which combine to provide a Tree Retention Rating that is measurable, consistent and repeatable

### Preliminary Tree Retention Rating

The Preliminary Tree Retention Rating is conducted assessing Tree Health and Structure to give an overall Condition Rating and Height and Spread to give an overall Size Rating. The following matrices identify how these are derived.

Condition Matrix				
Structure	Health			
	Good	Fair	Poor	Dead
Good	C1	C1	C3	C4
Fair	C1	C2	C3	C4
Poor	C3	C3	C4	C4
Failed	C4	C4	C4	C4

Size Matrix					
Spread	Height				
	>20	15-20	10-15	5-10	<5
>20	S1	S1	S1	S2	S3
15-20	S1	S1	S2	S3	S3
10-15	S1	S2	S2	S3	S4
5-10	S2	S3	S3	S4	S5
<5	S3	S3	S4	S5	S5

The results from the Condition and Size Matrices are then placed in the Preliminary Tree Retention Rating Matrix.

Preliminary Tree Retention Rating				
Size	Condition			
	C1	C2	C3	C4
S1	High	High	Low	Low
S2	High	Moderate	Low	Low
S3	Moderate	Moderate	Low	Low
S4	Moderate	Moderate	Low	Low
S5	Low	Low	Low	Low

The Preliminary Tree Retention Rating gives a base rating for all trees regardless of other environmental and/or amenity factors and any Special Value considerations. The Preliminary Tree Retention Rating can only be modified if these factors are considered to be of high or low enough importance to warrant increasing or, in a few cases, lowering the original rating.

### Tree Retention Rating Modifier

The Preliminary Tree Retention Rating is then qualified against the recognised Environmental and Amenity benefits that trees present to the community thereby providing a quantitative measure to determine the overall Tree Retention Rating. Data is collected in relation to Environmental and Amenity attributes which are compared through a set of matrices to produce a Tree Retention Rating Modifier.

Environmental Matrix				
Origin	Habitat			
	Active	Inactive	Potential	No Habitat
Indigenous	E1	E1	E2	E3
Native	E1	E2	E3	E3
Exotic	E2	E3	E3	E4
Weed	E3	E3	E4	E4

Amenity Matrix				
Character	Aesthetics			
	High	Moderate	Low	None
Important	P1	P1	P2	P3
Moderate	P1	P2	P3	P3
Low	P2	P3	P3	P4
None	P3	P3	P4	P4

Tree Retention Rating Modifier				
Amenity	Environment			
	E1	E2	E3	E4
P1	High	High	Moderate	Moderate
P2	High	Moderate	Moderate	Moderate
P3	Moderate	Moderate	Moderate	Moderate
P4	Moderate	Moderate	Moderate	Low

### Tree Retention Rating

The results of the Preliminary Tree Retention Rating and the Tree Retention Rating Modifier matrices are combined in a final matrix to give the actual Tree Retention Rating.

Tree Retention Rating Matrix			
Tree Retention Rating Modifier	Preliminary Tree Retention Rating		
	High	Moderate	Low
High	Important	High	Moderate
Moderate	High	Moderate	Low
Low	Moderate	Low	Low

## **Special Value Trees**

There are potentially trees that have Special Value for reasons outside of normal Arboricultural assessment protocols and therefore would not have been considered in the assessment to this point; to allow for this a Special Value characteristic that can override the Tree Retention Rating can be selected. Special Value characteristics that could override the Tree Retention Rating would include factors such as the following:

### *Cultural Values*

Memorial Trees, Avenue of Honour Trees, Aboriginal Heritage Trees, Trees planted by Dignitaries and various other potential categories.

### *Environmental Values*

Rare or Endangered species, Remnant Vegetation, Important Habitat for rare or endangered wildlife, substantial habitat value in an important biodiversity area and various other potential categories.

Where a tree achieves one or more Special Value characteristics the Tree Retention Rating will automatically be overridden and assigned the value of Important.

## **Tree Retention Rating Definitions**

- |                  |  |
|------------------|--|
| <b>Important</b> | These trees are considered to be important and will in almost all instances be required to be retained within any future development/redevelopment. It is highly unlikely that trees that achieve this rating would be approved for removal or any other tree damaging activity. Protection of these trees should as a minimum be consistent with Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> however given the level of importance additional considerations may be required.   |
| <b>High</b>      | These trees are considered to be important and will in most instances be required to be retained within any future development/redevelopment. It is unlikely that trees that achieve this rating would be approved for removal or any other tree damaging activity. Protection of these trees should be consistent with Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> .  |
| <b>Moderate</b>  | These trees are considered to be suitable for retention however they achieve less positive attributes than the trees rated as Important or High and as such their removal or other tree damaging activity is more likely to be considered to be acceptable in an otherwise reasonable and expected development. The design process should where possible look to retain trees with a Moderate Retention Rating. Protection of these trees, where they are identified to be retained, should be consistent with Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> . |
| <b>Low</b>       | These trees are not considered to be suitable for retention in any future development/redevelopment; trees in this category do not warrant special works or design modifications to allow for their retention. Trees in this category are likely to be approved for removal and/or other tree damaging activity in an otherwise reasonable and expected development. Protection of these trees, where they are identified to be retained, should be consistent with Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> .  |



## Appendix B - Tree Assessment Findings

# *Eucalyptus leucoxylon*

Tree No: 1

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** <5 metres  
**Health:** Poor  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 2.16 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is dieback of branch ends throughout the crown.

### Recommendation

Remove

Tree removal is recommended.

# *Eucalyptus leucoxylon*

Tree No: 2

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** >3 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 5.48 metres



### Legislative Status

Significant

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 7.20 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.20 metres



<b>Legislative Status</b>	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
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This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
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<b>Recommendation</b>	No Action
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No remedial action is currently recommended.

# *Eucalyptus leucoxylon*

Tree No: 5

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 5.40 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** <5 metres  
**Health:** Poor  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 2.89 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is dieback of branch ends throughout the crown.

### Recommendation

Remove

Tree removal is recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Poor  
**Form:** Fair

**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 5.94 metres



### Legislative Status

Regulated

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is extensive decay within the primary structure.

### Recommendation

Remove

Tree removal is recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.96 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Dead  
**Structure:** Poor  
**Form:** Atypical  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** Surpassed  
**Tree Protection Zone:** 5.40 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

This tree is dead as indicated by an absence of live foliage.

### Recommendation

Remove

Tree removal is recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 6.36 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >20 metres  
**Spread:** >15 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 8.76 metres



### Legislative Status

Regulated

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 6.24 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 2.04 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Dead  
**Structure:** Poor  
**Form:** Atypical

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** Surpassed  
**Tree Protection Zone:** 2.04 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

This tree is dead as indicated by an absence of live foliage.

### Recommendation

Remove

Tree removal is recommended.

## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Poor  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 5.40 metres



<b>Legislative Status</b>	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
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This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
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There is dieback of branch ends throughout the crown.

<b>Recommendation</b>	Remove
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Tree removal is recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** <5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 2.00 metres



<b>Legislative Status</b>	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
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This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
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<b>Recommendation</b>	No Action
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No remedial action is currently recommended.

## Sugar Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Poor  
**Form:** Poor  
  
**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 7.68 metres



### Legislative Status

Regulated

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is extensive decay within the primary structure.

### Recommendation

Remove

Tree removal is recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 7.08 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** <5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.48 metres



<b>Legislative Status</b>	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
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This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
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<b>Recommendation</b>	No Action
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No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** <5 metres  
**Health:** Fair  
**Structure:** Poor  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 3.60 metres



<b>Legislative Status</b>	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
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This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
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There is extensive decay within the primary structure.

<b>Recommendation</b>	Remove
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Tree removal is recommended.

## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	3.36 metres



Legislative Status	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
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This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
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Recommendation	No Action
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No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.84 metres



<b>Legislative Status</b>	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
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This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
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<b>Recommendation</b>	No Action
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No remedial action is currently recommended.

## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	2.88 metres



Legislative Status	Unregulated
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This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	3.60 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>5 metres
Health:	Good
Structure:	Fair
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	3.36 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.80 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Silver Gimlet

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Poor  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 2.88 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is dieback of branch ends throughout the crown.

### Recommendation

Remove

Tree removal is recommended.

## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >20 metres  
**Spread:** >20 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** >3 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 13.80 metres



<b>Legislative Status</b>	<b>Significant</b>
This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Observations</b>	
<b>Recommendation</b>	<b>No Action</b>
No remedial action is currently recommended.	



## River Red Gum

Inspected:	5 February 2019
Height:	<5 metres
Spread:	<5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	2.00 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.28 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.04 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 6.24 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Poor

**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 5.44 metres



<b>Legislative Status</b>	<b>Regulated</b>
---------------------------	------------------

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

<b>Retention Rating</b>	<b>Moderate</b>
-------------------------	-----------------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	<b>No Action</b>
-----------------------	------------------

No remedial action is currently recommended.

## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 7.44 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	2.76 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Poor
Form:	Poor
Trunk Circumference:	<2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	3.49 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.08 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Desert Ash

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.00 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Poor  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 4.20 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
-------------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
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There is an unstable union in the primary structure.

<b>Recommendation</b>	Remove
-----------------------	--------

Tree removal is recommended.

## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.04 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	6.24 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Poor
Form:	Poor
Trunk Circumference:	<2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	5.28 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
--------------

There is an unstable union in the primary structure.

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Lemon Scented Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	4.68 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 5.58 metres



<b>Legislative Status</b>	<b>Regulated</b>
This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Observations</b>	
<b>Recommendation</b>	<b>No Action</b>
No remedial action is currently recommended.	



## Desert Ash

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.00 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.28 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.04 metres



<b>Legislative Status</b>	<b>Unregulated</b>
---------------------------	--------------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	<b>Moderate</b>
-------------------------	-----------------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	<b>No Action</b>
-----------------------	------------------

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.24 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 2.64 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
-------------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >20 metres  
**Spread:** >15 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 10.80 metres



### Legislative Status

Regulated

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

### Retention Rating

High

This tree has a High Retention Rating and should be protected in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## River Red Gum

Inspected:	5 February 2019
Height:	>5 metres
Spread:	<5 metres
Health:	Fair
Structure:	Poor
Form:	Poor
Trunk Circumference:	<2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	3.36 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
--------------

There is an unstable union in the primary structure.

Recommendation	Remove
----------------	--------

Tree removal is recommended.

## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Poor  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 6.96 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
-------------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
---------------------

There is extensive decay within the primary structure.

<b>Recommendation</b>	Remove
-----------------------	--------

Tree removal is recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.04 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.24 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 4.56 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Good  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.12 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 7.56 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 8.64 metres



### Legislative Status

Regulated

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.13 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Desert Ash

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** <5 metres  
**Health:** Poor  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 2.00 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is dieback of branch ends throughout the crown.

### Recommendation

Remove

Tree removal is recommended.

# Corymbia maculata

Tree No: 61

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.48 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.76 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 4.32 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.15 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.76 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 4.08 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

Inspected:	5 February 2019
Height:	>5 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	2.28 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	3.24 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.08 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.28 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	3.60 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.92 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.60 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.48 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	<5 metres
Spread:	<5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	2.00 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
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Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.16 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>5 metres
Spread:	<5 metres
Health:	Good
Structure:	Fair
Form:	Poor
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	2.00 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.96 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	4.08 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.16 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Lemon Scented Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 4.44 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.16 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	4.68 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Poor  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 6.00 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
-------------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
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There is an unstable union in the primary structure.

<b>Recommendation</b>	Remove
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Tree removal is recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.36 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	5.40 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	5.16 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	4.56 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.56 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	3.12 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 2.52 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.28 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** <5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 2.88 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.36 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.84 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>5 metres
Health:	Good
Structure:	Fair
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	3.96 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.80 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 6.60 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



# Corymbia maculata

Tree No: 99

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.96 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

# Corymbia maculata

Tree No: 100

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 5.76 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 7.92 metres

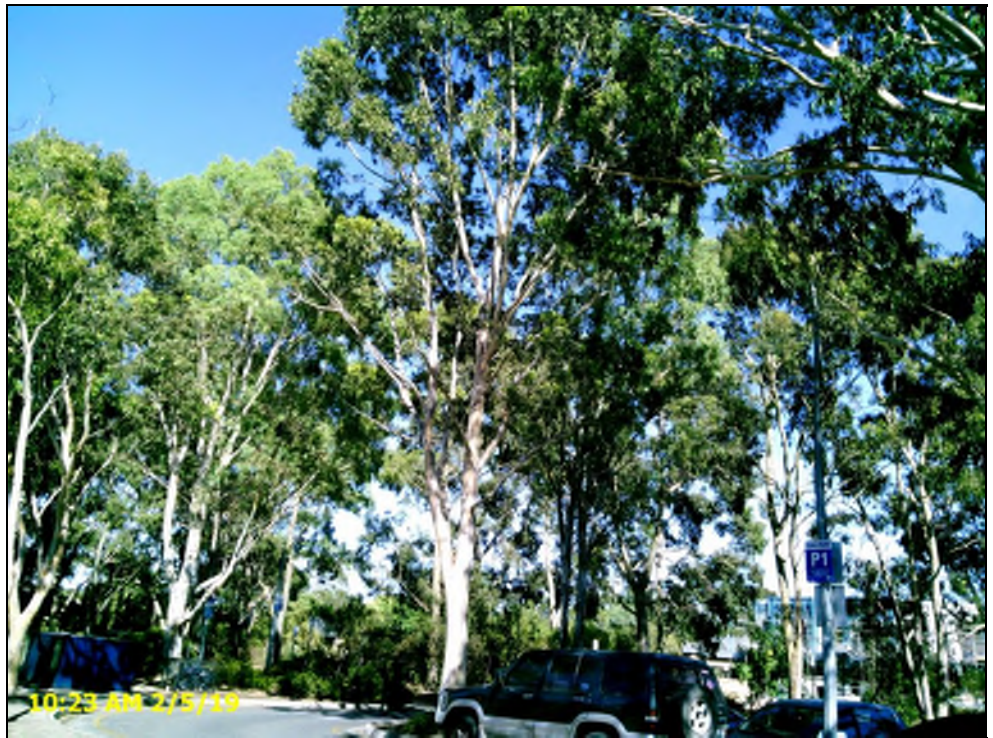


<b>Legislative Status</b>	<b>Regulated</b>
This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.	
<b>Retention Rating</b>	<b>Moderate</b>
This tree has a Moderate Retention Rating and could be considered for retention in any future development.	
<b>Observations</b>	
<b>Recommendation</b>	<b>No Action</b>
No remedial action is currently recommended.	



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.00 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Poor  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 5.92 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Low

This tree has a Low Retention Rating and should not form a material constraint to any future development.

### Observations

There is an unstable union in the primary structure.

### Recommendation

Remove

Tree removal is recommended.



## River Red Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Fair

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 6.48 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** <5 metres  
**Health:** Poor  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** <10 years  
**Tree Protection Zone:** 2.00 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Low
-------------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

<b>Observations</b>
---------------------

There is dieback of branch ends throughout the crown.

<b>Recommendation</b>	Remove
-----------------------	--------

Tree removal is recommended.

## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>5 metres
Health:	Good
Structure:	Fair
Form:	Fair
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	4.08 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.72 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Fair  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 5.04 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

Maintain TPZ

Tree is owned by local government therefore apply AS4970-2009 Protection of Trees on Development Sites.

## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	4.56 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >10 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.60 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.64 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 6.96 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 5.40 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>10 metres
Spread:	>10 metres
Health:	Good
Structure:	Fair
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	3.60 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.

## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	5.16 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.20 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.20 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.92 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Poor
Form:	Poor
Trunk Circumference:	<2 metres
Useful Life Expectancy:	<10 years
Tree Protection Zone:	6.60 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Low
------------------	-----

This tree has a Low Retention Rating and should not form a material constraint to any future development.

Observations
--------------

The tree has a history of branch failure.

Recommendation	Remove
----------------	--------

Tree removal is recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >10 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Fair  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 4.68 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

## Spotted Gum

Inspected:	5 February 2019
Height:	>15 metres
Spread:	>10 metres
Health:	Good
Structure:	Fair
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>10 years
Tree Protection Zone:	4.44 metres



Legislative Status	Unregulated
--------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

Retention Rating	Moderate
------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

Observations
--------------

Recommendation	No Action
----------------	-----------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >15 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Good  
  
**Trunk Circumference:** >2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 8.64 metres



<b>Legislative Status</b>	<b>Regulated</b>
---------------------------	------------------

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

<b>Retention Rating</b>	<b>Moderate</b>
-------------------------	-----------------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	<b>No Action</b>
-----------------------	------------------

No remedial action is currently recommended.



## Spotted Gum

**Inspected:** 5 February 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 3.00 metres



<b>Legislative Status</b>	Unregulated
---------------------------	-------------

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

<b>Retention Rating</b>	Moderate
-------------------------	----------

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

<b>Observations</b>
---------------------

<b>Recommendation</b>	No Action
-----------------------	-----------

No remedial action is currently recommended.

**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** >15 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.40 metres



## Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

## Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

## Observations

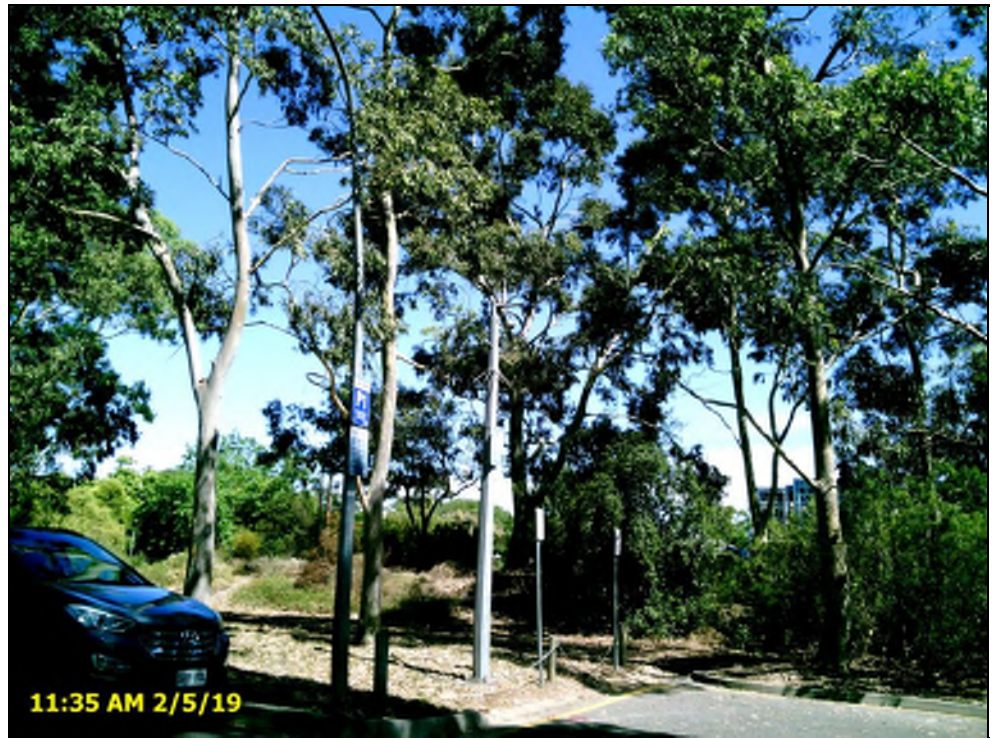
## Recommendation

No Action

No remedial action is currently recommended.



**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** >15 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.40 metres



## Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

## Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

## Observations

## Recommendation

No Action

No remedial action is currently recommended.



**Inspected:** 5 February 2019  
**Height:** <5 metres  
**Spread:** >15 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 2.40 metres



## Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

## Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

## Observations

## Recommendation

No Action

No remedial action is currently recommended.

## South Australian Blue Gum

**Inspected:** 5 February 2019  
**Height:** >15 metres  
**Spread:** >15 metres  
**Health:** Fair  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** >3 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 15.00 metres



### Legislative Status

Significant

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Claret Ash

Inspected:	14 June 2019
Height:	>5 metres
Spread:	>5 metres
Health:	Good
Structure:	Good
Form:	Good
Trunk Circumference:	<2 metres
Useful Life Expectancy:	>20 years
Tree Protection Zone:	3.24 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.



## Claret Ash

**Inspected:** 14 June 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.84 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## Claret Ash

**Inspected:** 14 June 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Good  
**Form:** Good

**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >20 years  
**Tree Protection Zone:** 3.12 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

### Recommendation

No Action

No remedial action is currently recommended.

## Claret Ash

**Inspected:** 14 June 2019  
**Height:** >5 metres  
**Spread:** >5 metres  
**Health:** Good  
**Structure:** Fair  
**Form:** Poor  
  
**Trunk Circumference:** <2 metres  
**Useful Life Expectancy:** >10 years  
**Tree Protection Zone:** 4.08 metres



### Legislative Status

Unregulated

This tree is not regulated by the Development Act 1993. This tree does not achieve a regulated trunk circumference.

### Retention Rating

Moderate

This tree has a Moderate Retention Rating and could be considered for retention in any future development.

### Observations

Signs of root plate instability due to poor planting.

### Recommendation

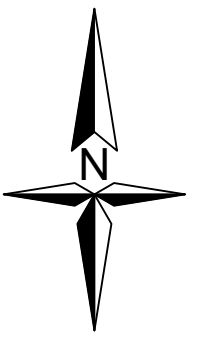
No Action

No remedial action is currently recommended.



## Appendix C - Mapping



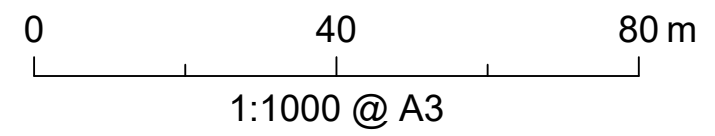


### Retention Rating

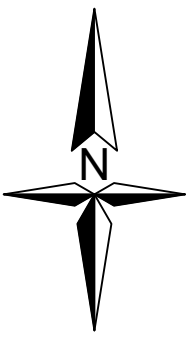
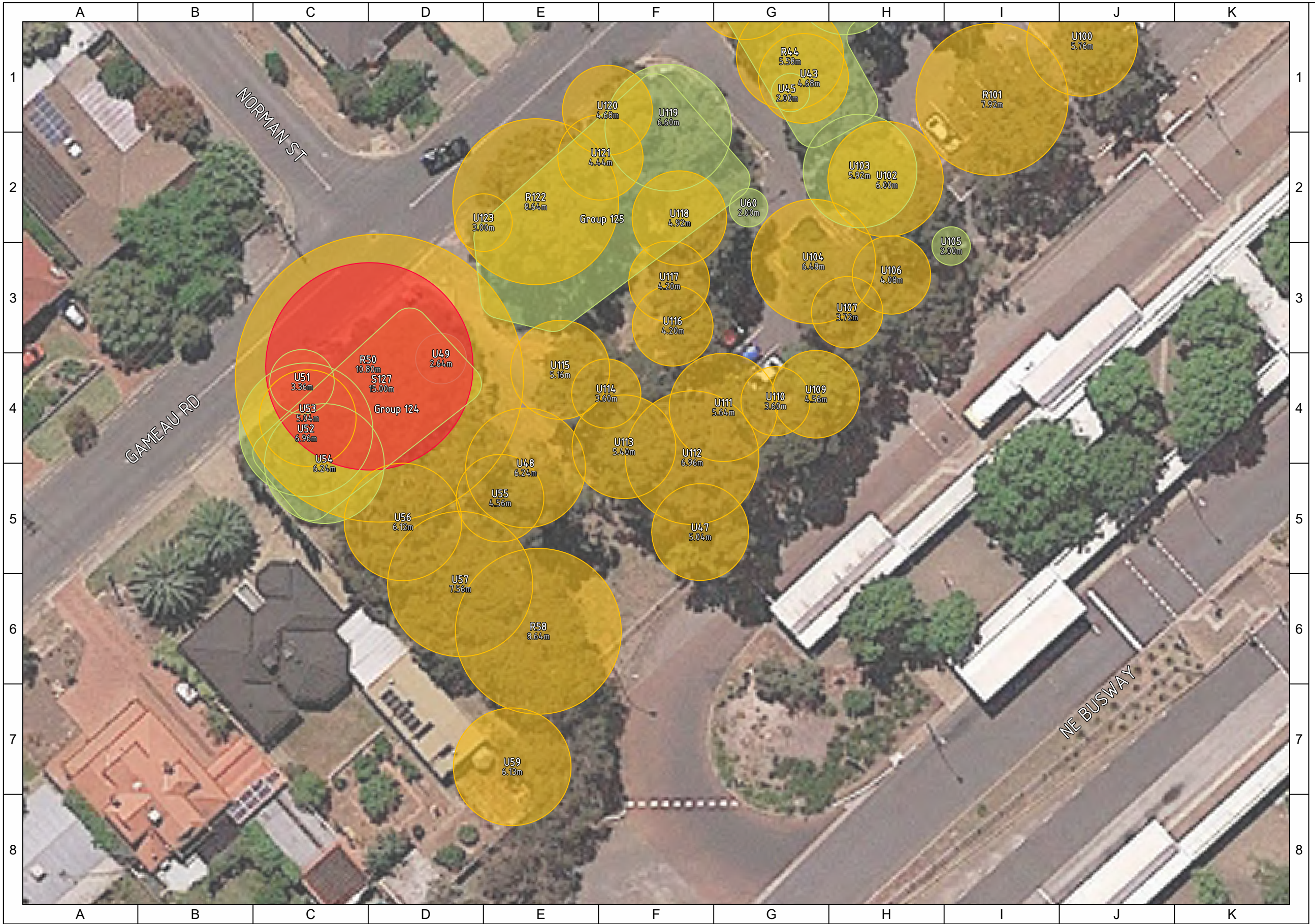
- 0  Important
- 1  High
- 97  Moderate
- 33  Low

Date: 14/06/2019 Rev: 1  
 Ref: ATS5360-ParadisePTA V3  
 Arborman Tree Solutions  
 23 Aberdeen Street  
 Port Adelaide SA 5015  
 (08) 8240 5555  
[www.arborman.com.au](http://www.arborman.com.au)

## Locality Sheet and Summary







### Legislative Status

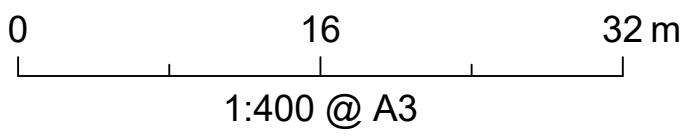
- S Significant
- R Regulated
- U Unregulated
- E Exempt
- NV Nat Veg Act

### Retention Rating

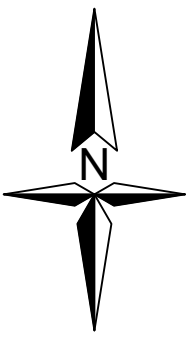
-  Important
-  High
-  Moderate
-  Low

Date: 14/06/2019 Rev: 1  
 Ref: ATS5360-ParadisePTA V3  
 Arborman Tree Solutions  
 23 Aberdeen Street  
 Port Adelaide SA 5015  
 (08) 8240 5555  
[www.arborman.com.au](http://www.arborman.com.au)

## Preliminary Tree Assessment - Sheet 1







### Legislative Status

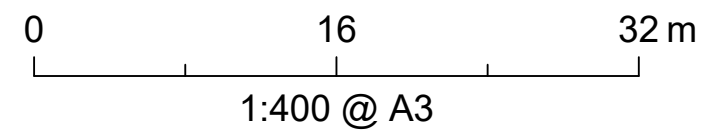
- S Significant
- R Regulated
- U Unregulated
- E Exempt
- NV Nat Veg Act

### Retention Rating

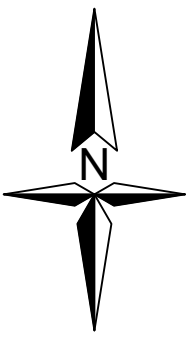
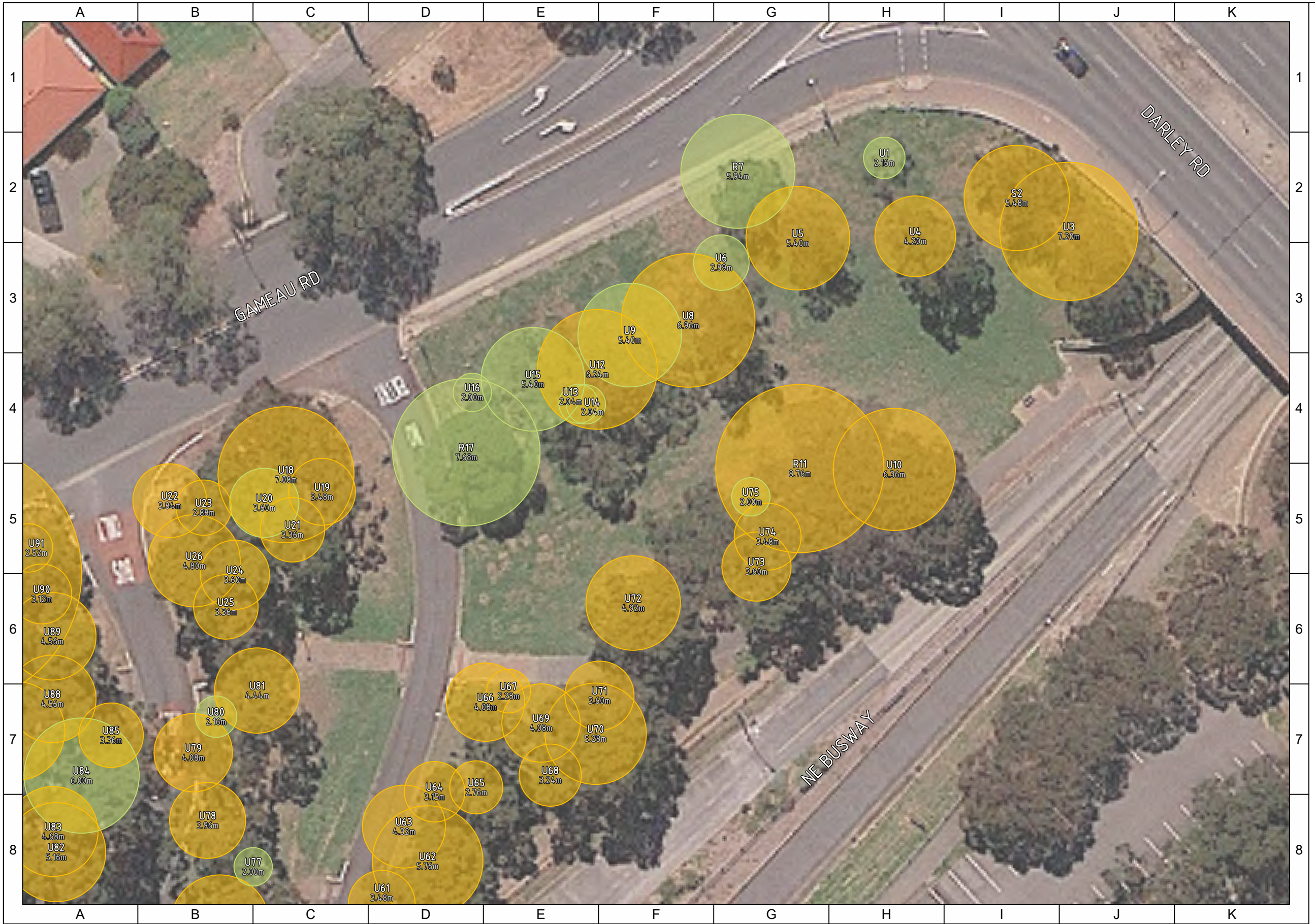
- Important
- High
- Moderate
- Low

Date: 14/06/2019 Rev: 1  
 Ref: ATS5360-ParadisePTA V3  
 Arborman Tree Solutions  
 23 Aberdeen Street  
 Port Adelaide SA 5015  
 (08) 8240 5555  
[www.arborman.com.au](http://www.arborman.com.au)

## Preliminary Tree Assessment - Sheet 2











### Legislative Status

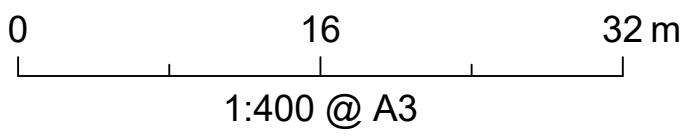
- S Significant
- R Regulated
- U Unregulated
- E Exempt
- NV Nat Veg Act

### Retention Rating

-  Important
-  High
-  Moderate
-  Low

Date: 14/06/2019 Rev: 1  
 Ref: ATS5360-ParadisePTA V3  
 Arborman Tree Solutions  
 23 Aberdeen Street  
 Port Adelaide SA 5015  
 (08) 8240 5555  
[www.arborman.com.au](http://www.arborman.com.au)

## Preliminary Tree Assessment - Sheet 3



## Appendix D - Tree Assessment Summary



# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
1	<i>Eucalyptus leucoxylon</i>	Unregulated	Low	2.16 metres	There is dieback of branch ends throughout the crown.	Tree removal is recommended.
2	<i>Eucalyptus leucoxylon</i>	Significant	Moderate	5.48 metres		No remedial action is currently recommended.
3	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	7.20 metres		No remedial action is currently recommended.
4	<i>Corymbia citriodora</i>	Unregulated	Moderate	4.20 metres		No remedial action is currently recommended.
5	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	5.40 metres		No remedial action is currently recommended.
6	<i>Eucalyptus leucoxylon</i>	Unregulated	Low	2.89 metres	There is dieback of branch ends throughout the crown.	Tree removal is recommended.
7	<i>Eucalyptus leucoxylon</i>	Regulated	Low	5.94 metres	There is extensive decay within the primary structure.	Tree removal is recommended.
8	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	6.96 metres		No remedial action is currently recommended.
9	<i>Eucalyptus leucoxylon</i>	Unregulated	Low	5.40 metres	This tree is dead as indicated by an absense of live foliage.	Tree removal is recommended.
10	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	6.36 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
11	<i>Eucalyptus leucoxylon</i>	Regulated	Moderate	8.76 metres		No remedial action is currently recommended.
12	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	6.24 metres		No remedial action is currently recommended.
13	<i>Eucalyptus leucoxylon</i>	Unregulated	Low	2.04 metres		No remedial action is currently recommended.
14	<i>Eucalyptus leucoxylon</i>	Unregulated	Low	2.04 metres	This tree is dead as indicated by an absense of live foliage.	Tree removal is recommended.
15	<i>Corymbia citriodora</i>	Unregulated	Low	5.40 metres	There is dieback of branch ends throughout the crown.	Tree removal is recommended.
16	<i>Corymbia citriodora</i>	Unregulated	Low	2.00 metres		No remedial action is currently recommended.
17	<i>Eucalyptus cladocalyx</i>	Regulated	Low	7.68 metres	There is extensive decay within the primary structure.	Tree removal is recommended.
18	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	7.08 metres		No remedial action is currently recommended.
19	<i>Corymbia citriodora</i>	Unregulated	Moderate	3.48 metres		No remedial action is currently recommended.
20	<i>Corymbia citriodora</i>	Unregulated	Low	3.60 metres	There is extensive decay within the primary structure.	Tree removal is recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
21	<i>Corymbia citriodora</i>	Unregulated	Moderate	3.36 metres		No remedial action is currently recommended.
22	<i>Corymbia citriodora</i>	Unregulated	Moderate	3.84 metres		No remedial action is currently recommended.
23	<i>Corymbia citriodora</i>	Unregulated	Moderate	2.88 metres		No remedial action is currently recommended.
24	<i>Corymbia citriodora</i>	Unregulated	Moderate	3.60 metres		No remedial action is currently recommended.
25	<i>Corymbia citriodora</i>	Unregulated	Moderate	3.36 metres		No remedial action is currently recommended.
26	<i>Corymbia citriodora</i>	Unregulated	Moderate	4.80 metres		No remedial action is currently recommended.
27	<i>Eucalyptus campaspe</i>	Unregulated	Low	2.88 metres	There is dieback of branch ends throughout the crown.	Tree removal is recommended.
28	<i>Eucalyptus camaldulensis</i>	Significant	Moderate	13.80 metres		No remedial action is currently recommended.
29	<i>Eucalyptus camaldulensis</i>	Unregulated	Low	2.00 metres		No remedial action is currently recommended.
30	<i>Eucalyptus camaldulensis</i>	Unregulated	Low	2.28 metres		No remedial action is currently recommended.



# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
31	<i>Eucalyptus camaldulensis</i>	Unregulated	Moderate	5.04 metres		No remedial action is currently recommended.
32	<i>Eucalyptus camaldulensis</i>	Unregulated	Moderate	6.24 metres		No remedial action is currently recommended.
33	<i>Eucalyptus camaldulensis</i>	Regulated	Moderate	5.44 metres		No remedial action is currently recommended.
34	<i>Eucalyptus camaldulensis</i>	Unregulated	Moderate	7.44 metres		No remedial action is currently recommended.
35	<i>Corymbia maculata</i>	Unregulated	Moderate	2.76 metres		No remedial action is currently recommended.
36	<i>Corymbia maculata</i>	Unregulated	Low	3.49 metres		No remedial action is currently recommended.
37	<i>Corymbia maculata</i>	Unregulated	Moderate	4.08 metres		No remedial action is currently recommended.
38	<i>Fraxinus angustifolia ssp. angustifolia</i>	Unregulated	Low	2.00 metres		No remedial action is currently recommended.
39	<i>Corymbia citriodora</i>	Unregulated	Low	4.20 metres	There is an unstable union in the primary structure.	Tree removal is recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
40	<i>Corymbia citriodora</i>	Unregulated	Moderate	5.04 metres		No remedial action is currently recommended.
41	<i>Corymbia citriodora</i>	Unregulated	Moderate	6.24 metres		No remedial action is currently recommended.
42	<i>Corymbia citriodora</i>	Unregulated	Low	5.28 metres	There is an unstable union in the primary structure.	No remedial action is currently recommended.
43	<i>Corymbia citriodora</i>	Unregulated	Moderate	4.68 metres		No remedial action is currently recommended.
44	<i>Corymbia citriodora</i>	Regulated	Moderate	5.58 metres		No remedial action is currently recommended.
45	<i>Fraxinus angustifolia</i> ssp. <i>angustifolia</i>	Unregulated	Low	2.00 metres		No remedial action is currently recommended.
46	<i>Corymbia citriodora</i>	Unregulated	Moderate	5.28 metres		No remedial action is currently recommended.
47	<i>Corymbia citriodora</i>	Unregulated	Moderate	5.04 metres		No remedial action is currently recommended.
48	<i>Corymbia citriodora</i>	Unregulated	Moderate	6.24 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
49	<i>Corymbia citriodora</i>	Unregulated	Low	2.64 metres		No remedial action is currently recommended.
50	<i>Eucalyptus camaldulensis</i>	Regulated	High	10.80 metres		No remedial action is currently recommended.
51	<i>Eucalyptus camaldulensis</i>	Unregulated	Low	3.36 metres	There is an unstable union in the primary structure.	Tree removal is recommended.
52	<i>Eucalyptus camaldulensis</i>	Unregulated	Low	6.96 metres	There is extensive decay within the primary structure.	Tree removal is recommended.
53	<i>Eucalyptus camaldulensis</i>	Unregulated	Moderate	5.04 metres		No remedial action is currently recommended.
54	<i>Eucalyptus camaldulensis</i>	Unregulated	Moderate	6.24 metres		No remedial action is currently recommended.
55	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	4.56 metres		No remedial action is currently recommended.
56	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	6.12 metres		No remedial action is currently recommended.
57	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	7.56 metres		No remedial action is currently recommended.
58	<i>Eucalyptus leucoxylon</i>	Regulated	Moderate	8.64 metres		No remedial action is currently recommended.



# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
59	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	6.13 metres		No remedial action is currently recommended.
60	<i>Fraxinus angustifolia</i> ssp. <i>angustifolia</i>	Unregulated	Low	2.00 metres	There is dieback of branch ends throughout the crown.	Tree removal is recommended.
61	<i>Corymbia maculata</i>	Unregulated	Moderate	3.48 metres		No remedial action is currently recommended.
62	<i>Corymbia maculata</i>	Unregulated	Moderate	5.76 metres		No remedial action is currently recommended.
63	<i>Corymbia maculata</i>	Unregulated	Moderate	4.32 metres		No remedial action is currently recommended.
64	<i>Corymbia maculata</i>	Unregulated	Moderate	3.15 metres		No remedial action is currently recommended.
65	<i>Corymbia maculata</i>	Unregulated	Moderate	2.76 metres		No remedial action is currently recommended.
66	<i>Corymbia maculata</i>	Unregulated	Moderate	4.08 metres		No remedial action is currently recommended.
67	<i>Corymbia maculata</i>	Unregulated	Moderate	2.28 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
68	<i>Corymbia maculata</i>	Unregulated	Moderate	3.24 metres		No remedial action is currently recommended.
69	<i>Corymbia maculata</i>	Unregulated	Moderate	4.08 metres		No remedial action is currently recommended.
70	<i>Corymbia maculata</i>	Unregulated	Moderate	5.28 metres		No remedial action is currently recommended.
71	<i>Corymbia maculata</i>	Unregulated	Moderate	3.60 metres		No remedial action is currently recommended.
72	<i>Corymbia maculata</i>	Unregulated	Moderate	4.92 metres		No remedial action is currently recommended.
73	<i>Corymbia maculata</i>	Unregulated	Moderate	3.60 metres		No remedial action is currently recommended.
74	<i>Corymbia maculata</i>	Unregulated	Moderate	3.48 metres		No remedial action is currently recommended.
75	<i>Corymbia maculata</i>	Unregulated	Low	2.00 metres		No remedial action is currently recommended.
76	<i>Corymbia maculata</i>	Unregulated	Moderate	5.16 metres		No remedial action is currently recommended.
77	<i>Corymbia maculata</i>	Unregulated	Low	2.00 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
78	<i>Corymbia maculata</i>	Unregulated	Moderate	3.96 metres		No remedial action is currently recommended.
79	<i>Corymbia maculata</i>	Unregulated	Moderate	4.08 metres		No remedial action is currently recommended.
80	<i>Eucalyptus leucoxylon</i>	Unregulated	Low	2.16 metres		No remedial action is currently recommended.
81	<i>Corymbia citriodora</i>	Unregulated	Moderate	4.44 metres		No remedial action is currently recommended.
82	<i>Corymbia maculata</i>	Unregulated	Moderate	5.16 metres		No remedial action is currently recommended.
83	<i>Corymbia maculata</i>	Unregulated	Moderate	4.68 metres		No remedial action is currently recommended.
84	<i>Corymbia maculata</i>	Unregulated	Low	6.00 metres	There is an unstable union in the primary structure.	Tree removal is recommended.
85	<i>Corymbia maculata</i>	Unregulated	Moderate	3.36 metres		No remedial action is currently recommended.
86	<i>Corymbia maculata</i>	Unregulated	Moderate	5.40 metres		No remedial action is currently recommended.
87	<i>Corymbia maculata</i>	Unregulated	Moderate	5.16 metres		No remedial action is currently recommended.



# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
88	<i>Corymbia maculata</i>	Unregulated	Moderate	4.56 metres		No remedial action is currently recommended.
89	<i>Corymbia maculata</i>	Unregulated	Moderate	4.56 metres		No remedial action is currently recommended.
90	<i>Corymbia maculata</i>	Unregulated	Moderate	3.12 metres		No remedial action is currently recommended.
91	<i>Corymbia maculata</i>	Unregulated	Moderate	2.52 metres		No remedial action is currently recommended.
92	<i>Corymbia maculata</i>	Unregulated	Moderate	2.28 metres		No remedial action is currently recommended.
93	<i>Corymbia maculata</i>	Unregulated	Moderate	2.88 metres		No remedial action is currently recommended.
94	<i>Corymbia maculata</i>	Unregulated	Moderate	3.36 metres		No remedial action is currently recommended.
95	<i>Corymbia maculata</i>	Unregulated	Moderate	3.84 metres		No remedial action is currently recommended.
96	<i>Corymbia maculata</i>	Unregulated	Moderate	3.96 metres		No remedial action is currently recommended.
97	<i>Corymbia maculata</i>	Unregulated	Moderate	4.80 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
98	<i>Corymbia maculata</i>	Unregulated	Moderate	6.60 metres		No remedial action is currently recommended.
99	<i>Corymbia maculata</i>	Unregulated	Moderate	3.96 metres		No remedial action is currently recommended.
100	<i>Corymbia maculata</i>	Unregulated	Moderate	5.76 metres		No remedial action is currently recommended.
101	<i>Corymbia maculata</i>	Regulated	Moderate	7.92 metres		No remedial action is currently recommended.
102	<i>Corymbia maculata</i>	Unregulated	Moderate	6.00 metres		No remedial action is currently recommended.
103	<i>Eucalyptus camaldulensis</i>	Unregulated	Low	5.92 metres	There is an unstable union in the primary structure.	Tree removal is recommended.
104	<i>Eucalyptus camaldulensis</i>	Unregulated	Moderate	6.48 metres		No remedial action is currently recommended.
105	<i>Corymbia maculata</i>	Unregulated	Low	2.00 metres	There is dieback of branch ends throughout the crown.	Tree removal is recommended.
106	<i>Corymbia maculata</i>	Unregulated	Moderate	4.08 metres		No remedial action is currently recommended.
107	<i>Corymbia maculata</i>	Unregulated	Moderate	3.72 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
108	<i>Eucalyptus leucoxylon</i>	Unregulated	Moderate	5.04 metres		Tree is owned by local government therefore apply AS4970-2009 Protection of Trees on Development Sites.
109	<i>Corymbia maculata</i>	Unregulated	Moderate	4.56 metres		No remedial action is currently recommended.
110	<i>Corymbia maculata</i>	Unregulated	Moderate	3.60 metres		No remedial action is currently recommended.
111	<i>Corymbia maculata</i>	Unregulated	Moderate	5.64 metres		No remedial action is currently recommended.
112	<i>Corymbia maculata</i>	Unregulated	Moderate	6.96 metres		No remedial action is currently recommended.
113	<i>Corymbia maculata</i>	Unregulated	Moderate	5.40 metres		No remedial action is currently recommended.
114	<i>Corymbia maculata</i>	Unregulated	Moderate	3.60 metres		No remedial action is currently recommended.
115	<i>Corymbia maculata</i>	Unregulated	Moderate	5.16 metres		No remedial action is currently recommended.
116	<i>Corymbia maculata</i>	Unregulated	Moderate	4.20 metres		No remedial action is currently recommended.



# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
117	<i>Corymbia maculata</i>	Unregulated	Moderate	4.20 metres		No remedial action is currently recommended.
118	<i>Corymbia maculata</i>	Unregulated	Moderate	4.92 metres		No remedial action is currently recommended.
119	<i>Corymbia maculata</i>	Unregulated	Low	6.60 metres	The tree has a history of branch failure.	Tree removal is recommended.
120	<i>Corymbia maculata</i>	Unregulated	Moderate	4.68 metres		No remedial action is currently recommended.
121	<i>Corymbia maculata</i>	Unregulated	Moderate	4.44 metres		No remedial action is currently recommended.
122	<i>Corymbia maculata</i>	Regulated	Moderate	8.64 metres		No remedial action is currently recommended.
123	<i>Corymbia maculata</i>	Unregulated	Moderate	3.00 metres		No remedial action is currently recommended.
124	Group - Weed	Unregulated	Moderate	2.40 metres		No remedial action is currently recommended.
125	Group - Weed	Unregulated	Moderate	2.40 metres		No remedial action is currently recommended.
126	Group - Weed	Unregulated	Moderate	2.40 metres		No remedial action is currently recommended.

# Tree Assessment Summary

Tree Number	Botanic Name	Legislative Status	Retention Rating	TPZ Radius	Observations	Recommendations
127	<i>Eucalyptus leucoxylon</i>	Significant	Moderate	15.00 metres		No remedial action is currently recommended.
128	<i>Fraxinus angustifolia</i> ssp. <i>oxycarpa</i> 'Raywood'	Unregulated	Moderate	3.24 metres		No remedial action is currently recommended.
129	<i>Fraxinus angustifolia</i> ssp. <i>oxycarpa</i> 'Raywood'	Unregulated	Moderate	3.84 metres		No remedial action is currently recommended.
130	<i>Fraxinus angustifolia</i> ssp. <i>oxycarpa</i> 'Raywood'	Unregulated	Moderate	3.12 metres		No remedial action is currently recommended.
131	<i>Fraxinus angustifolia</i> ssp. <i>oxycarpa</i> 'Raywood'	Unregulated	Moderate	4.08 metres	Signs of root plate instability due to poor planting.	No remedial action is currently recommended.

### **Attachment 3: Project Outcomes, Principles and Construction Management Outcomes**



## Project Outcomes

Transport elements	Project Specific Outcome
Passenger access & accessibility	Improve passenger access from the surrounding neighbourhoods to utilise the Paradise Interchange;
	Improve the pedestrian access from the existing carpark to the interchange;
Integrated Transport	Increase the number of Park'n'Ride spaces available to public transport passengers at the Paradise Interchange Precinct
Passenger information, safety & conveniences	Retain existing interchange infrastructure;
Bus Operations	Existing bus operations are retained without modification;
Traffic Operations	Minimise and mitigate the impacts to traffic operations from additional traffic associated with the Park'n'Ride facilities;
Public Transport Corridors	Encourage inter-modal connections for all commuters to public transport including pedestrians, cyclists and cars;
Interchange	An integrated transition from the bus stop interchange platform to the surrounding destinations and transfer locations;
Character Context	New infrastructure maintains and enriches the identity and character of the Paradise Interchange;
Safety	The delivery of the Project must at all times protect the safety of the public and the project personnel;
Traffic Operations	The construction of the Project minimises disruptions to the traffic network and bus operations;

*\*not all of these principles are being directly addressed by the Paradise Park 'n' Ride project. Refer to body of report that discuss what outcomes are addressed by this project.*

## Project Principles

Element	Principle
Passenger access & accessibility	Accessible (DDA) access with unassisted boarding at bus stops and accessible access for passenger transfer to bus services and vehicles;
	The access pathways to the bus stops are to maximise passenger access to the public transport network;
Connectivity and wayfinding	Passenger routes (all modes) are legible and clearly defined through intuitive wayfinding & directional signage;
	Attractive connectivity pathways which maximise opportunity for amenity, shade and weather protection;
Barriers	Severance is minimised and connectivity improved within and across the precinct;

	Integrated accessible infrastructure without a perceived or physical barriers or differentiation;
Welcoming	A public realm that is welcoming to all, inviting and safe, both day and night;
Equitable	Equitable and accessible access for all, following principles of universal design;

*\*not all of these principles are being directly addressed by the Paradise Park 'n' Ride project. Refer to body of report that discuss what outcomes are addressed by this project.*

## Construction Management Outcomes

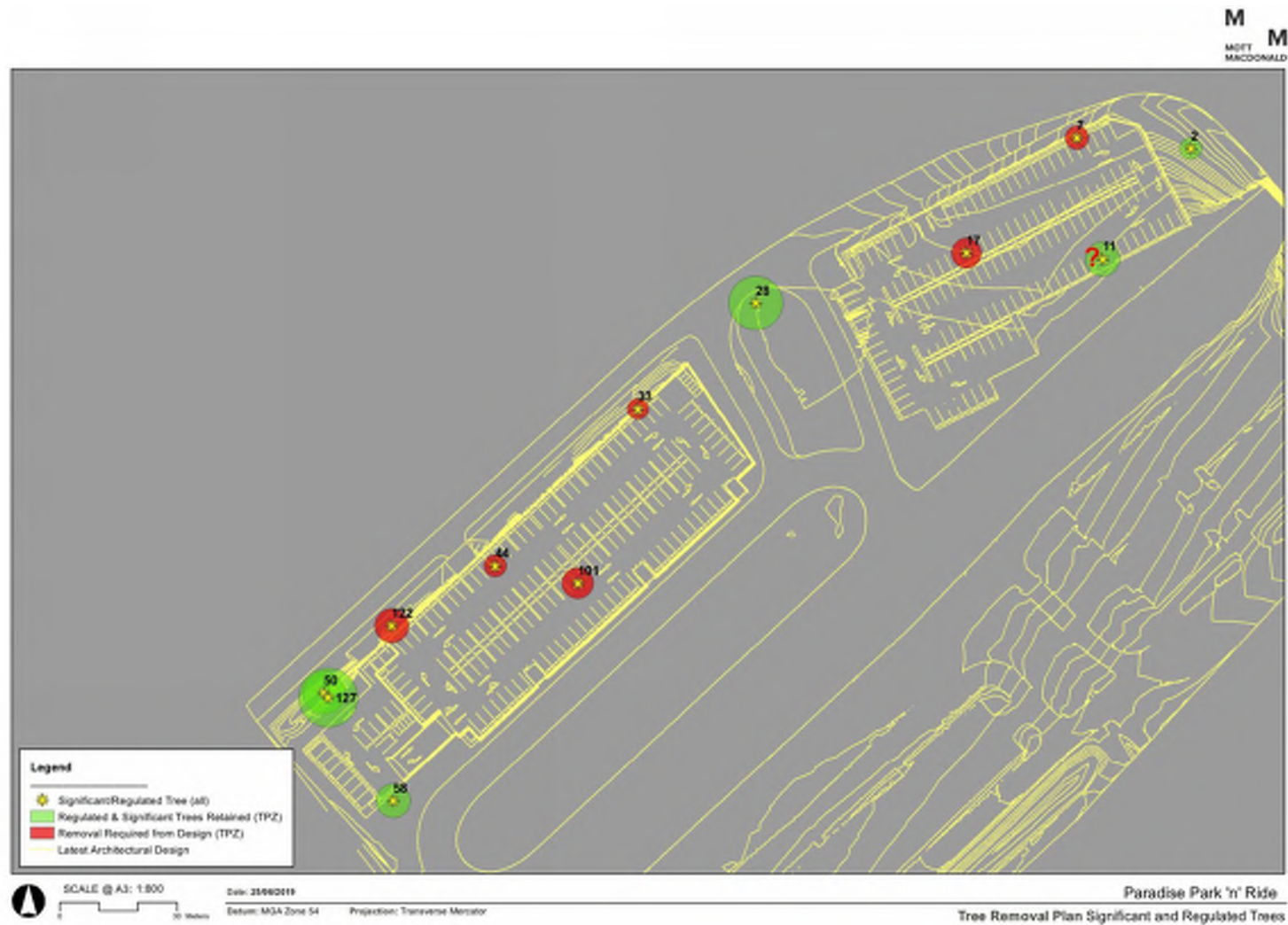
Element	Principle
Resilience	Infrastructure that is robust, easily maintained and resistant to damage by vandals;
	Equipment that is robust and appropriate for the operational environment;
	An enduring and readily maintainable facility that will age gracefully;
Operational Life	The operational life (design) of the infrastructure, equipment and materials are to be maximised;
Materials	Equipment and materials that can be easily replaced (in the event of damage);
	Materials and surfaces with an integrated, enduring finish are prioritised;
	Materials and detailing are not conducive to vandalism or graffiti;
	Standardised road furniture types consistent with the existing road network;
Element	Principle
Sustaining the asset	Existing and new assets are rationalised and reduced to minimise maintenance intervention;
	Rail and road infrastructure utilise equipment consistent with existing DPTI infrastructure (unless a value for money benefit can be demonstrated);
	Infrastructure that can be sustained within the existing (or lower) operational budget and requires minimal ongoing maintenance;
	Infrastructure that avoids litter traps, staining and the requirement for regular cleaning;
Environmental	Integration of environmentally sustainable principles to minimise short and long-term environmental impacts;
	Inclusion of green infrastructure and improved biodiversity;
	Utilise water sensitive urban design (WSUD) techniques (where practical);
	Align and implement DPTI's sustainability & environmental obligations;

	Landscaping that is self-sustaining avoiding ongoing irrigation or regular replanting;
Local Economy	Locally sourced or fabricated materials to support the local economy and minimise transport (where practical);
Quality	<p>Deliver quality and durable infrastructure within the project objectives, constraints and requirements;</p> <p>Quality infrastructure that makes a positive contribution to the local built and landscaping context through infrastructure that improves the social, functional and physical aspects of the precinct;</p>
Benefit	<p>Maximise the project benefits and benefit to cost ratio (BCR);</p> <p>The benefit to the South Australian economy and businesses is maximised;</p>
Whole of Life	<p>Reduce ongoing operational expenditure;</p> <p>Infrastructure that can be sustained within the existing (or lower) operational budget and requires minimal ongoing maintenance;</p> <p>Consideration of new or disruptive technologies that will assist in asset management and reduce whole-of-life costs</p> <p>Reduce initial capital expenditure within the project constraint</p>
Integrated transport and land use	<p>Integrated transport infrastructure and land-use solution that aligns with the 30-year plan for greater Adelaide;</p> <p>Support and enable future development and anticipated transport change in affected and surrounding areas;</p> <p>Enhanced and effective inter-modal connections for all commuters to public transport including pedestrians, cyclists and cars;</p> <p>Pedestrian and cycling networks are connected with functional pathways to public spaces, community attractions and the local street network (to improve the permeability);</p>
Amenity	<p>Enhanced amenity through infrastructure that improves the social, functional and physical aspects of the precinct;</p> <p>Impacts to the surrounding precinct from noise, spilled light, air and visual pollution are mitigated;</p> <p>Landscape is resilient and appropriate for the road and busway environments</p>
Passenger comfort & conveniences	<p>Furniture and passenger infrastructure for the physical comfort and accessible access for all passengers;</p> <p>Weather protection for passengers utilising the station and transfer between transport modes;</p>
Efficient and Reliable Road Travel	<p>Signalised intersections to operate efficiently in peak periods with future modelled traffic volumes (DOS of 0.9)</p> <p>Enable traffic growth on the road network(to 2036 modelled volumes);</p> <p>Impacts to local street access are minimised. Where access is impacted viable alternatives are provided;</p>
Efficient and Reliable Public Travel	<p>The signalling design and system shall maximise operational outcomes and flexibility, including travel time</p> <p>Vegetation that has the potential to impact bus operations) must be managed or removed</p>

*\* not all of these construction management outcomes are being directly addressed by the Paradise Park 'n' Ride project. Refer to body of report that discuss what outcomes are addressed by this project.*



## **Attachment 4: Tree Removal Plan**



## **Attachment 5: Light Spill Site Imagery**





Gameau Road, view west adjacent bus out road.



Gameau Road, view east adjacent Norman Road



Existing Paradise Park 'N Ride / Bus interchange view west adjacent existing bus out road



Existing Paradise Park 'N Ride view east adjacent Bus interchange

**Attachment 6: Definitions from the *Highways Act 1926***



Excerpts of relevant definitions from the *Highways Act 1926*:

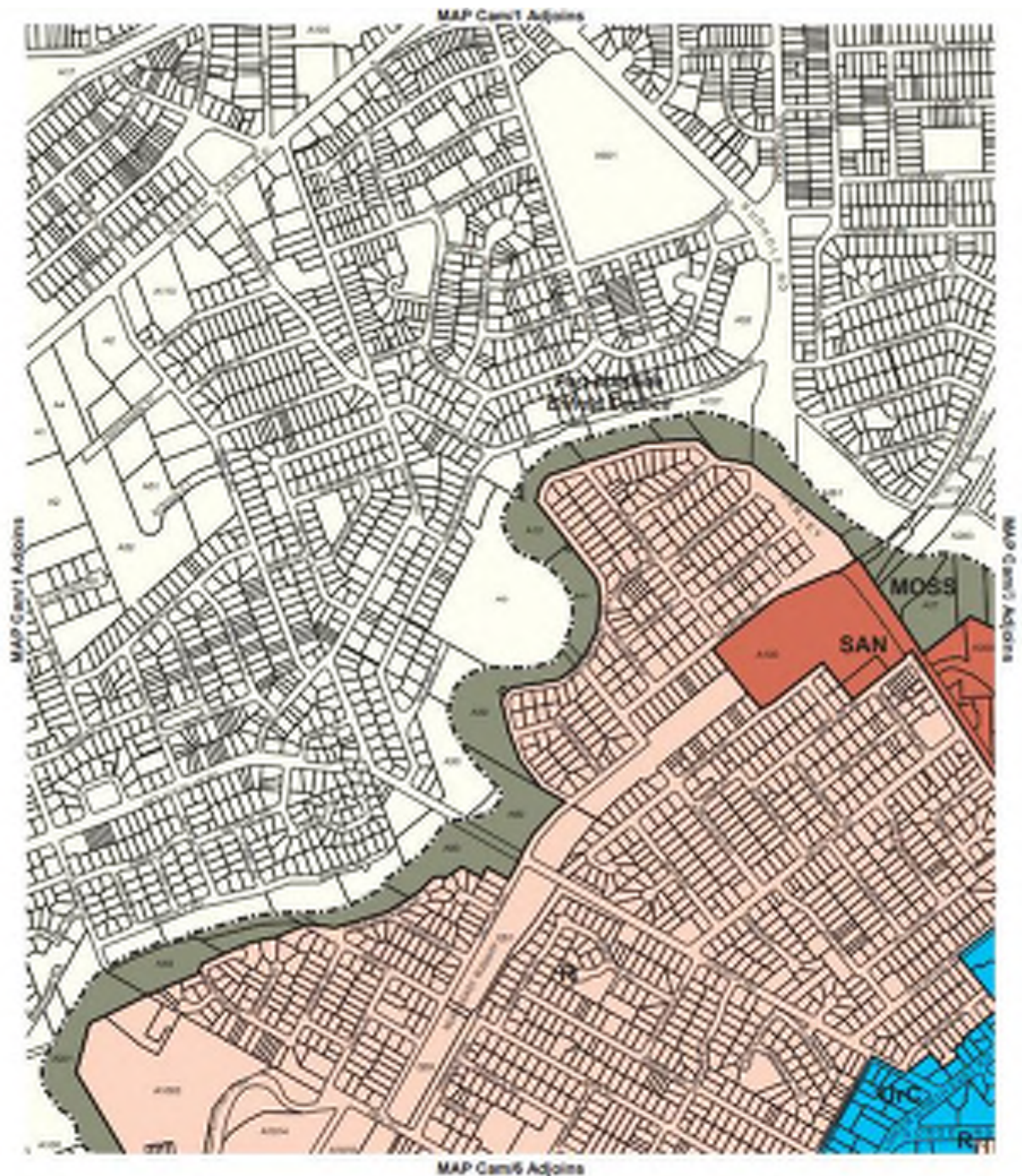
**road** means any street, road, thoroughfare, terrace, court, lane, alley, cul-de-sac, or place commonly used by the public, or to which the public are permitted to have access, and includes a part of a road;

**roadwork** means—

- (a) the construction of a road; or
- (b) the maintenance or repair of a road; or
- (c) the alteration of a road; or
- (d) the construction of drains and other structures for the drainage of water from a road; or
- (e) the installation of fences, railings, barriers or gates; or
- (f) the installation of traffic control devices, traffic islands or parking bays; or
- (g) the improvement of a road including (for example)—
  - (i) landscaping and beautification; or
  - (ii) installation of road lighting; or
- (h) the installation of amenities or equipment on or adjacent to a road for the use, enjoyment or protection of the public; or
- (ha) the construction of buildings or facilities relating to public transport or parking for users of public transport; or
- (i) the installation of signs on or adjacent to a road for the use or benefit of the public; or
- (j) any work in connection with a road.

**controlled-access road** means any road or part of any road or any land acquired by the Commissioner which is declared or otherwise taken to be a controlled-access road under this Act;

## **Attachment 7: Relevant Deveopment Provisions**



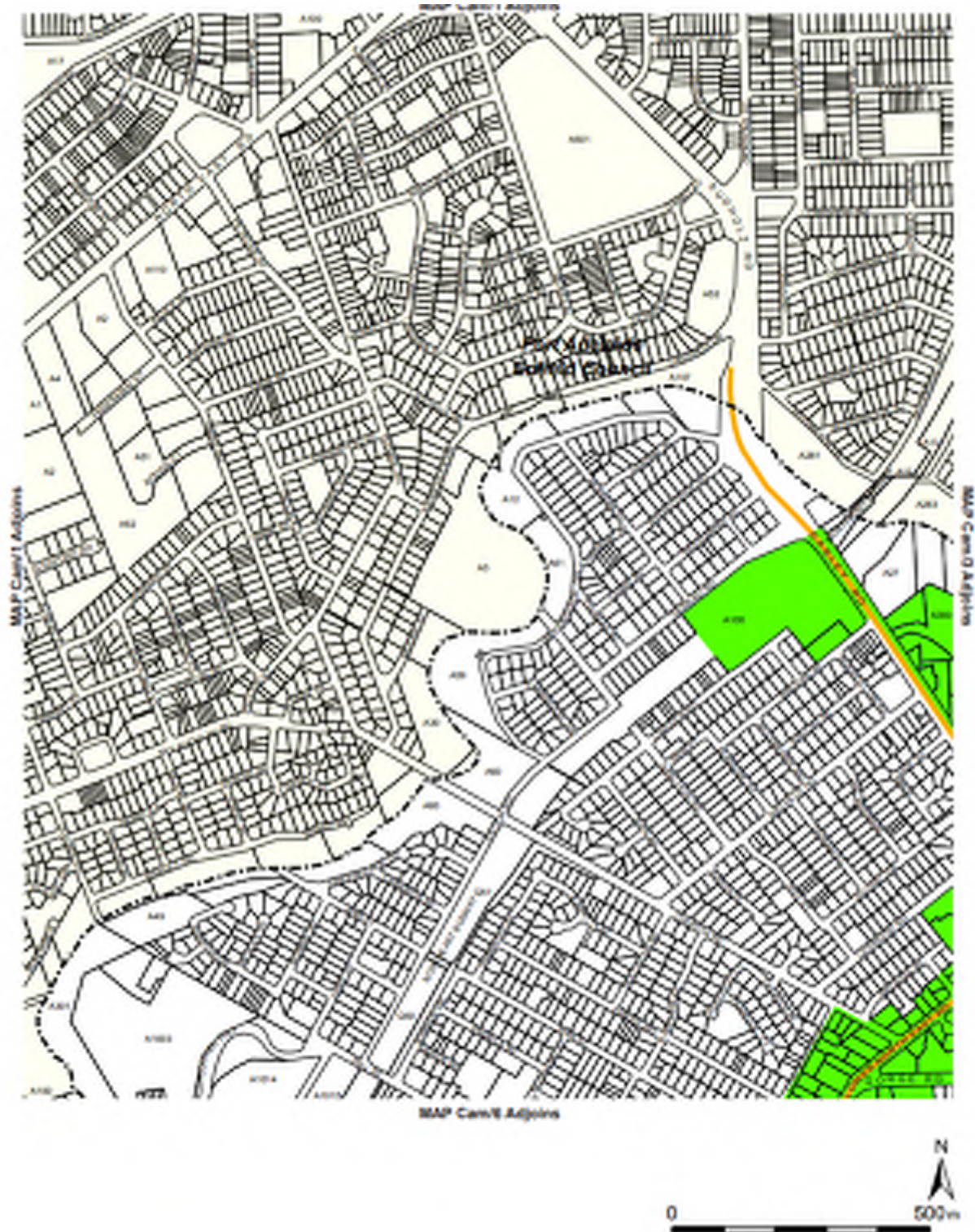
Landscape Conformal Colour Proposition, QGIS



## Zone Map Cam/2

CAMPBELLTOWN COUNCIL  
Consolidated - 16 January 2018



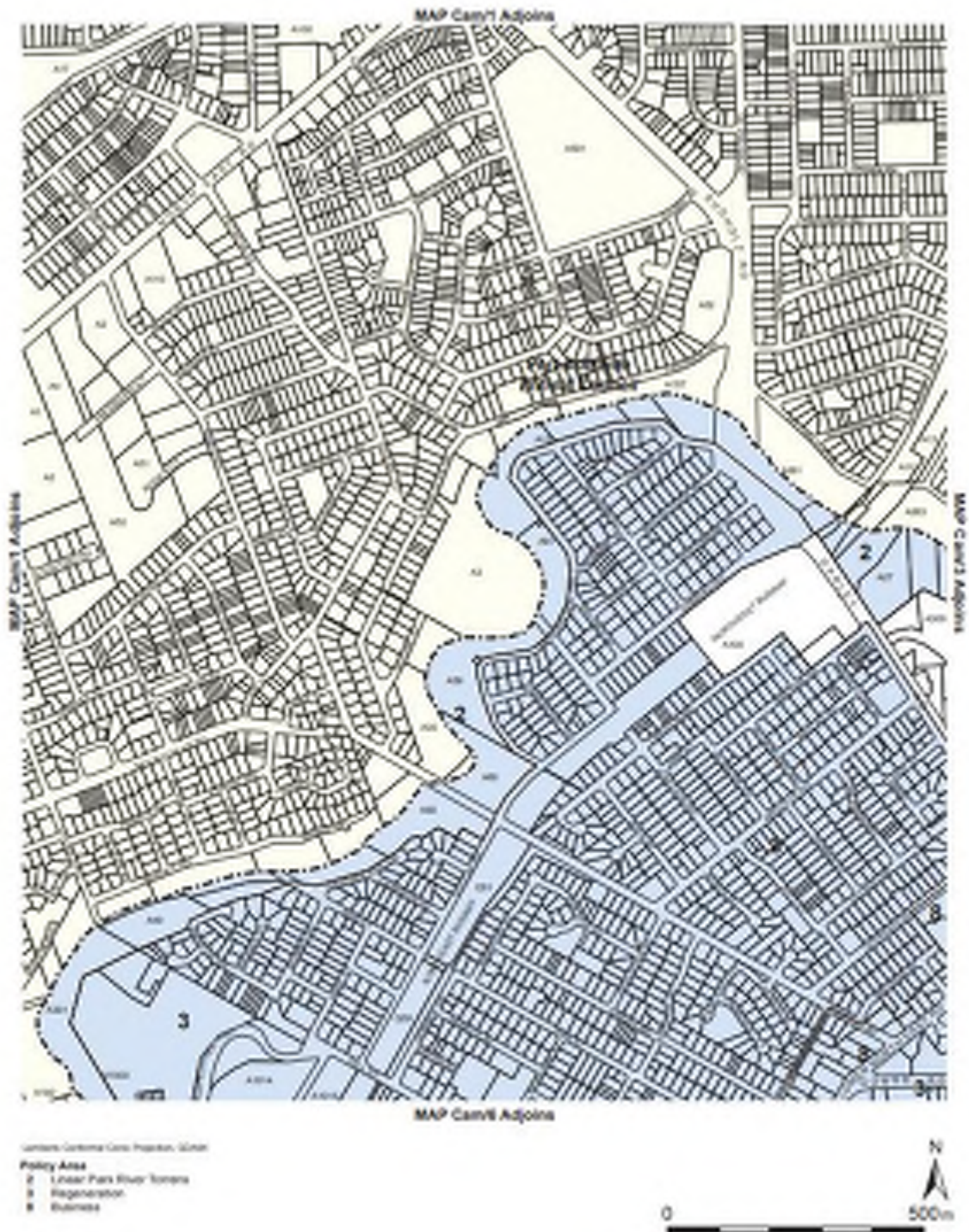


- Designated Road: type B road
- Noise and Air Emissions Designated Area
- Development Plan Boundary

## Overlay Map Cam/2 NOISE AND AIR EMISSIONS

CAMPBELLTOWN COUNCIL  
Consolidated - 16 January 2018



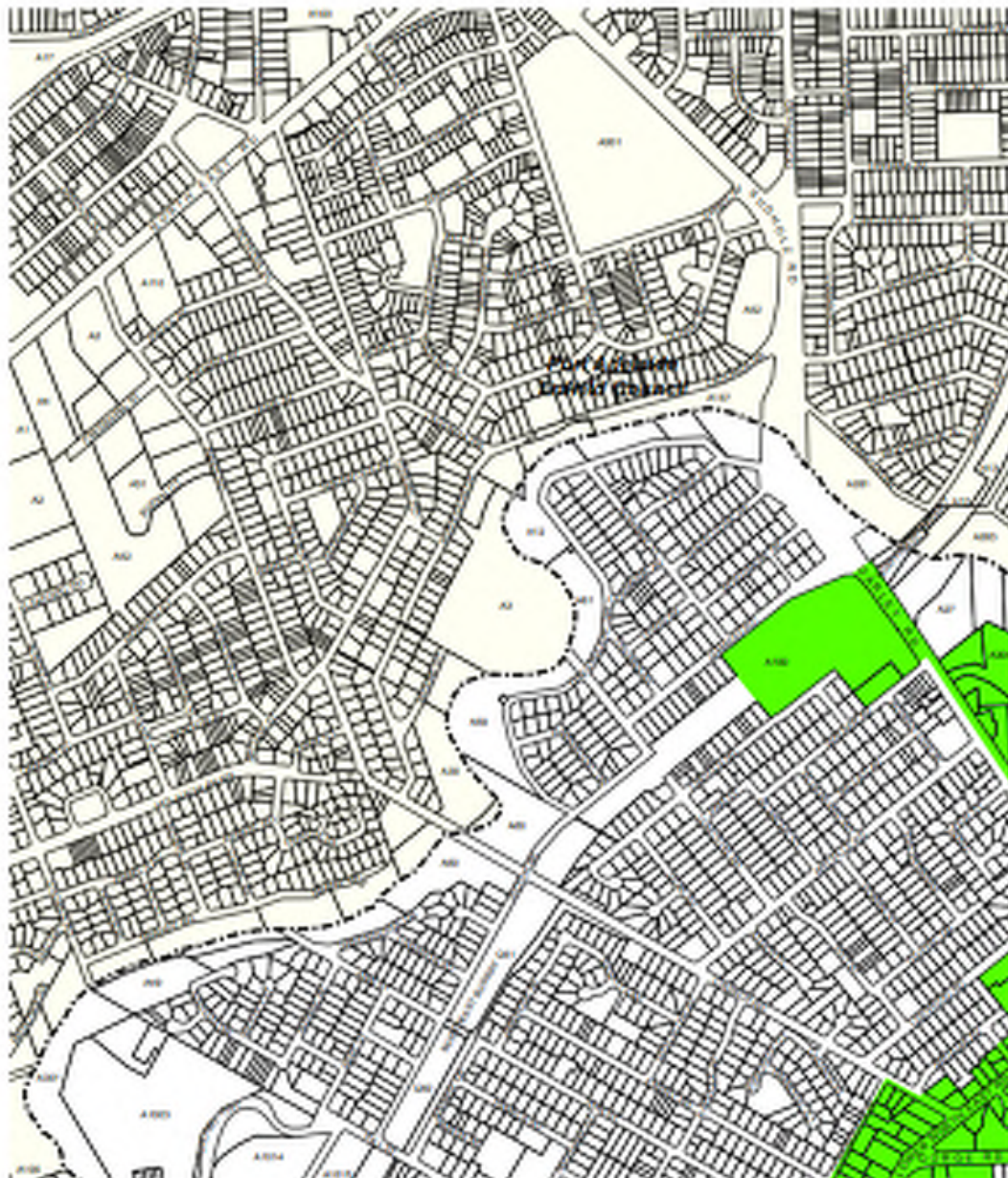


## Policy Area Map Cam/2

Policy Area Boundary  
Development Plan Boundary

CAMPBELLTOWN COUNCIL  
Consolidated - 16 January 2018





Affordable Housing Designated Area  
 Development Plan Boundary

## Overlay Map Cam/2 AFFORDABLE HOUSING

CAMPBELLTOWN COUNCIL  
Consolidated - 16 January 2018





PARADISE

## Concept Plan Map Cam/3 SUBURBAN ACTIVITY NODE ZONE

CAMPBELLTOWN COUNCIL  
Consolidated - 18 January 2013

## **Attachment 8: Architectural Elevations**







**ELEVATION 1 C**



**ELEVATION 2 C**



**CAR PARK FACADE CLADDING**



**RHINO-STOP TYPE 4**



## **Attachment 9: Proposed Plant Selections**

#### Trees

- 01. *Corymbia citriodora* 'Sourhaoui'  
Dwarf Lemon Scented Gum
- 02. *Corymbia maculata*  
Spotted Gum
- 03. *Eucalyptus leucosylon* ssp. *leucosylon*  
SA Blue Gum
- 04. *Koelerutera paniculata*  
Golden Rain Tree



#### Shrubs

- 05. *Alyogyne hakeifolia*  
Native Hibiscus
- 06. *Cortea alba*  
White Correa
- 07. *Teucrium fruticosum*  
Tree Germander
- 08. *Rhagodia candolleana*  
Coastal Ruby Saltbush



#### Groundcover

- 09. *Acacia multiflora* 'Cascade'  
Knife Leaf Wattle
- 10. *Cortea decumbens*  
Spreading Correa
- 11. *Dianella revoluta*  
Blue Flax-lily
- 12. *Erremophila glabra* 'Yakari Carpet'  
Emu Bush
- 13. *Myoporum parvifolium*  
Creeping Boobilla
- 14. *Grevillea sibirica* 'Gin-Gin Gem'  
Gin-Gin Gem Grevillea



#### Climber

- 15. *Ficus pumila*  
Creeping Fig





**Attachment 10: Golder Associates Site Contamination Report (23/01/2019)**



## REPORT

# Detailed Site Investigation - Factual Contamination Report

*O'Bahn Park n Ride, Paradise Interchange, South Australia*

Submitted to:

### **PTPA**

Level 9 68 Grenfell Street  
Adelaide SA 5000

Submitted by:

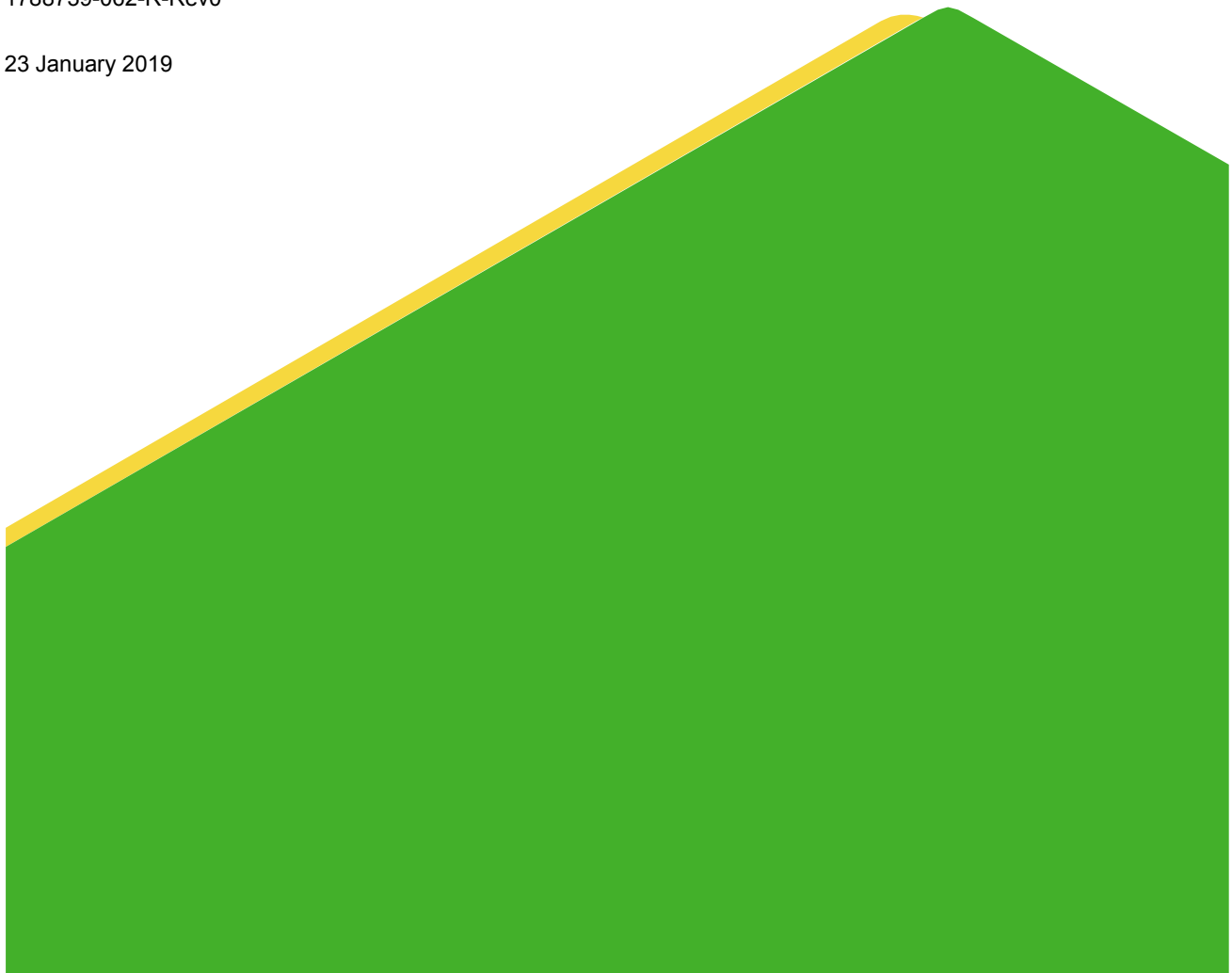
### **Golder Associates Pty Ltd**

118 Franklin Street Adelaide, South Australia 5000 Australia

+61 8 8213 2100

1788739-062-R-Rev0

23 January 2019



## Distribution List

1 e-copy - PTPA

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Lotsearch Report

### APPENDIX B

Current Certificate of Title

### APPENDIX C

Ownership History Chart

### APPENDIX D

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Chemical Results Tables

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Laboratory Certificates of Analysis

### APPENDIX H

Important Information



## 1.0 INTRODUCTION

The Public Transport Projects Alliance (PTPA) commissioned Golder Associates Pty Ltd (Golder) to undertake a factual detailed site investigation (DSI) at the Paradise Interchange project site located at the intersection of Darley Road and Gameau Road, Paradise (the site). The Paradise Interchange is proposed to undergo a development into a new O-Bahn Park'n'Ride facility.

The DSI comprises a desktop assessment and intrusive soil contamination investigation. The desktop work was used to inform the design of the intrusive soil contamination investigation. This DSI forms part of a larger scope of work undertaken by Golder that includes an interpretive geotechnical investigation (Golder Ref 1788793-068-R, *Geotechnical Interpretive Report*).

The location and extent of the site is presented in Figure 1.

The factual DSI was undertaken in accordance with our technical memorandum to PTPA (reference 1788739-061-TM-Rev0, dated 23 November 2018).

### 1.1 Objectives

The objectives of the desktop assessment were to:

- Research current and historical land uses, and associated activities undertaken at or adjacent to the site to identify whether potentially contaminating activities (PCAs), defined in the Environment Protection Regulations 2009, may have occurred on or near the site;
- Provide a desktop assessment of risk based on the likelihood that PCAs could have caused site contamination, with consideration of the proposed land use; and
- Inform the rationale and design of the intrusive soil contamination investigation.

The objectives of the intrusive soil contamination investigation were to:

- Assess the contamination status of the site based on the historical land use, in the context of the proposed development;
- Characterise the nature and extent of site contamination in accordance with the ASC NEPM; and
- provide indicative waste classification of soil in areas proposed for excavation.

## 2.0 SCOPE OF WORK

The scope of work completed by Golder included the following:

- Reviewing site history information and developing an understanding of activities that may have been undertaken on the site and their potential to have caused site contamination. The history of potentially contaminating activities was researched using the following sources of information:
  - Aerial photographic records obtained from Lotsearch Pty Ltd (Lotsearch).
  - Current certificates of title information provided by the Land Titles Office.
  - Published geology maps of the region.
  - Department for Environment and Water (DEW) Water Connect groundwater database.
  - South Australia Environment Protection Authority (EPA) Public Register search.
  - Sands and McDougall South Australian directories.
  - Previous environmental investigation reports for the site and surrounding area obtained from DPTI and EPA.
- Preparation of a site-specific Health, Safety and Environment Plan (HSEP).
- Undertaking a site walkover.
- Undertaking intrusive soil investigations, including drilling of 23 boreholes within the site.
- Logging of soil conditions at each sampling location, including consideration of odours, staining, presence of fill, and other potential indicators of contamination.
- Collection and laboratory analysis of soil samples for the identified or inferred contaminants of interest, including collection of field duplicates for quality control (QC) purposes.
- Tabulation and review of laboratory testing results against applicable screening criteria.
- Preparation of this report to document the assessment work performed, present site observations and analytical results.

## 3.0 SITE SETTING

### 3.1 General Description

The site is located approximately 9 km north-east of the Adelaide CBD in Paradise, South Australia. At the time of the assessment the site comprised a car park for the adjacent Paradise O'Bahn bus interchange. The Paradise interchange is one of three interchanges that form part of the guided O'Bahn Busway (O'Bahn) along with Klemzig and Tea Tree Gully, connecting the north-eastern suburbs to the city centre.

The site has a boundary with Gameau Road to the north and north-west and is surrounded by residential housing to the west. The southern and south-eastern portion of the site is bound by the O-Bahn, then additional parking facilities for the Paradise interchange and residential housing. The site is bound to the north-east by Darley Road and metropolitan open space including a reserve and skate park.

### 3.2 Property Description

The site comprises a portion of the land title. Property details for land that comprised the site is presented in Table 1. A copy of the current CT is included in Appendix B.

**Table 1: Property Details**

Identification	Details
Address	Paradise Interchange - Lot 100 Darley Road, Paradise, SA, 5075
Allotments	Lot 100
Certificates of Title (CT)	CT 5065 / 83 (portion of)
Area	Paradise
Hundred	Adelaide
Local Government Authority	Campbelltown City Council
Current Owners	Commissioner of Highways of Adelaide SA 5000
Current Land Use	Car park and bus interchange
Proposed Land Use	Bus interchange

### 3.3 Topography

The site has an average elevation of approximately 56 m AHD (Australian Height Datum) and was relatively flat. The vegetated north-western and north-eastern boundaries were marginally elevated compared to southern site areas.



### 3.4 Regional Geology

The site lies within the Golden-Grove–Adelaide Embayment, just to the west of the Eden-Burnside Fault. The stratigraphy of the region is characterised by the Pooraka Formation. This formation of Pleistocene age comprise mostly fluvial and alluvial mottled clays and silts, with sandy and gravelly base deposits.

The Pooraka Formation is generally underlain by Hindmarsh Clay- mainly red-brown clay and sandy clay of the Pleistocene age, and overlain by the St Kilda Formation, characterised by Holocene age sands and coastal marine sediments.

The Atlas of Australian Acid Sulphate Soils (CSIRO) categorises the region as a low probability of acid sulphate soil occurrence.

### 3.5 Hydrogeology

Based on the available groundwater bore records and information obtained from the DEW's Water Connect database, regional groundwater depths within 1.0 km of the site generally ranged between 2.9 to 24 m below ground level (BGL). The groundwater was reported to have salinity concentrations of (total dissolved solids, TDS) ranging between 328 to 2,916 mg/L and electrical conductivity (EC) between 596 to 5,330 mg/L. These records indicated the groundwater condition varied between potable to slightly brackish water. The pH ranges from 6.6 to 8.4 pH units.

Water Connect records indicate one groundwater wells was (or had previously been) located on the site (6628-11701) and had been installed to a depth of 10.45 m below ground level (m bgl). The well was installed for engineering purposes in 1981, however no further details were recorded.

The Golden Grove-Adelaide Embayment contains up to three Quaternary and two Tertiary aquifers and a fractured rock aquifer. The hydrostratigraphy of the area is complicated due to various erosional and depositional boundaries, lateral facies changes and faulting in the region.

The tertiary aquifers are generally low yielding and characterised by thin layers of fine sand. The Quaternary and Tertiary aquifers become thin (approximately 10 to 100 m thick, with quaternary aquifer thickness rarely exceeding two to three meters), shallow and interconnected in the vicinity of the River Torrens. The shallow fractured rock aquifer near the River Torrens contains groundwater of low salinity and significant yield.

Regional groundwater is likely to be influenced by topography and the presence of the River Torrens toward the northern portion of the site. The River Torrens is predominately a gaining river suggesting that there is connectivity between the River Torrens and the Q1 aquifer that flows towards the St Vincent Gulf.

The Water Connect search information is presented in the Lotsearch Report in Appendix A.

### 3.6 Surface Water

The closest sensitive receiving surface water environment is the River Torrens, which was approximately 100 m to the east, 300 m to the west and 400 m to the north of the site, respectively.

Based on topography, surface water at the site is inferred to generally flow in a southerly direction, away from the River Torrens.

### 3.7 Site Visit

On 7 December 2018, a site visit was conducted by a field representative from Golder. The following key observations were made during the site visit:

- The site comprised vegetated open space and a public car park (O'Bahn passenger parking).
- The site was bound by Darley Road to the east and Gameau Road, to the north. The site was bound by the O'Bahn to the south, and residential housing to the west.
- In the eastern portion of the site, topography sloped predominantly to the south, away from the River Torrens. The central and western portions of the site appear generally flat.
- The central and eastern portions of the site were occupied by vehicles and predominantly comprised vehicle parking pavements and a driveway. Surface materials within this area were a mixture of sealed asphalt pavement, unsealed garden bed and walkway brick paving. A single driveway entrance (from Gameau Road to the north) was present at the north-western portion of the site.
- Several driveway entrances (from Gameau Road to the north) were present at the north-eastern portion of the site.
- The western portion of the site was predominantly unsealed and vegetated with grasses and eucalyptus trees. The western portion of the site comprised the northern bridge abutment of the adjacent bridge on Darley Road and subsequently the topography in this area slopes down towards the centre of the site to the west.

### 3.8 Adjacent Land Uses

The following adjacent land uses within 100 m of the site were observed:

- North - Junction of Gameau Road and Darley Road, before Beefacres Reserve and residential housing
- South - O'Bahn, O'Bahn passenger parking, followed by Walker Avenue reserve
- East – Darley Road, followed by metropolitan open space, River Torrens and Paradise Skate Park
- West – O'Bahn, residential housing.

## 4.0 SITE HISTORY INFORMATION

### 4.1 Property Ownership

Current and available historical titles were obtained from DPTI and the Lands Title Office. An overview of the property ownership history is provided below.

The current Certificate of Title (CT 5065 / 83) is owned by the Commissioner of Highways of Adelaide SA 5000. The site has been allocated to one CT since 1989, when smaller portions of land were purchased and consolidated by the State Transport Authority. The site is contained within a larger parcel of land allocated to the CT. A copy of the current certificate of title for the site is provided in Appendix B.

The earliest available Certificates of Title dated prior to 1989 were from 1886, 1894, 1900 and 1911, when the site was comprised of multiple smaller parcels of land owned mainly by private owners. These owners included:

- Privately owned CT 493 / 28 in 1886. The land under this title was divided and transferred among a variety of people, including multiple gardeners, a widow and B. F. Balnaves Limited until the land was transferred to the Commissioner of Highways in 1961, before being transferred to the State Transport Authority in 1989.
- Privately owned CT 583 / 44 in 1894. The land under this title was divided and transferred among a variety of people, including multiple gardeners and a mill-hand until the land was transferred to the State Transport Authority in 1989.
- Privately owned CT 665 / 194 in 1900 and CT 859 / 47 in 1911. The land was transferred among a variety of people, including a gardener and his wife, horticulturalists, and a bricklayer until the land was transferred to the Commissioner of Highways in 1969, before being transferred to the State Transport Authority in 1987.

The portion of the CT land that was outside the site boundary was developed between 1960 and 1980 by the Commissioner of Highways and State Transport Authority. Ownership of land before this time was private, residents of which professions included: x-ray technician, machinist, sawmiller, contractor, retired market gardener, despatch supervisor, baker, and tool maker.

A detailed property ownership summary is provided in Appendix C.

### 4.2 Historical Aerial Photograph Review

Selected aerial photographs of the site and surrounding area, covering the period from 1949 to 2010 inclusive were viewed. These photographs are held by Mapland at the Department for Environment and Water. Copies of selected photographs are provided in the Lotsearch Report in Appendix A.

A summary of the features and apparent land use(s) observed in the historical aerial photography is provided in Table 2 below.



**Table 2: Aerial Photography Summary**

Date	Source	Site	Surrounding Areas
1949	Mapland	<p>The site appeared to comprise 5 portions used for small-scale agricultural purposes (inferred to be predominantly market gardening). Each was divided by small roads or driveways. Linear crops appear visible in the southern portion of the site.</p> <p>A line of established trees was present in the north-eastern corner. No site structures were visible. The site was bound by present-day Gameau Road to the north and north-west and Darley Road to the east and north-east. The southern boundary was not clearly defined and landuse appeared to continue onto neighbouring land.</p>	<p>Surrounding land appeared to be used predominantly for agricultural purposes, with cropping to the east and west of the site. Several inferred residential buildings appear in all directions surrounding the site. The River Torrens was present to the north and east of the site and meandered in an approximate south-east to north-west direction.</p>
1959	Mapland	<p>The site appeared relatively unchanged from the 1949 image. Linear cropping appears visible within a small portion of the south-west of the site.</p> <p>The small line of established trees in the north-eastern corner of the site were no longer present.</p>	<p>The surrounding land appeared relatively unchanged from the 1949 image, with the land use appearing to be predominantly agricultural. Several small dwellings remain apparent in the surrounding area.</p>
1968	Mapland	<p>Three buildings (likely residential) have been built along Gameau Road, in the north-eastern portion of the site.</p> <p>The remainder of the site appeared to be used for agricultural purposes with some evidence of patchy weeds consistent with disused land.</p>	<p>The surrounding land appeared to have undergone significant urban residential development since 1959. Land surrounding the site to the north, south and west appeared predominantly residential. Land directly adjacent to the southern boundary of the site (and extending to the south-west), still appeared to be used for market gardening.</p> <p>Land to the east, between the site and the River Torrens, appeared to still be used for predominantly market gardening.</p>
1979	Mapland	<p>The site appeared relatively unchanged from the 1968 image.</p>	<p>The surrounding land use appeared mostly unchanged from the 1968 image, however residential housing to the north and south of site appeared to have increased in density.</p> <p>Darley Road (east of site) had been bituminised and increased in width (two lanes in both directions).</p>
1989	Mapland	<p>The site had been significantly redeveloped since the 1979 image. The three buildings along the northern boundary and associated market gardens were no longer present.</p>	<p>The O'Bahn has been constructed adjacent to and south of the site, running in a north-easterly to south-westerly direction.</p> <p>Further south from the O'Bahn there appeared to be three large carparks and associated</p>

Date	Source	Site	Surrounding Areas
		<p>The site appeared to comprise a large bitumised carpark in the central portion of the site, and was surrounded by landscaped areas with grass and evenly distributed trees in the north-east and south-west site portions.</p> <p>The southern boundary appeared predominantly bituminised, inferred to be vehicle pathways or a bus driveway for the O-Bahn that was present to the south.</p> <p>Two large driveways enter the site from Gameau Road from the north-east and two smaller driveways lead into the carpark from the north-west.</p>	<p>landscaped areas, with grass and sporadic trees. Further south remained residential.</p> <p>To the north of the site, development has occurred at the junction between Gameau Road and Darley Road.</p>
1999	Mapland	The site appeared relatively unchanged from the 1989 image.	The surrounding land appeared to be generally unchanged from the 1989 image, with the exception of what appeared to be a skate park to the east of the site across Darley Road.
2002	Mapland	The site appeared relatively unchanged from the 1999 image	The density of residential properties had increased. Otherwise, the surrounding land appears to be generally unchanged from the 1999 image.
2010	Mapland	The site appears largely unchanged from the 2002 aerial image.	The surrounding land appears largely unchanged from the 2002 aerial image.

### 4.3 Section 7 Search

A Section 7 search under the Land and Business (Sales and Conveyancing) Act 1994 was conducted by the South Australian EPA for the site. The search results indicated the following, as of 7 December 2018:

- There were no mortgages, charges or prescribed encumbrances affecting the site under the relevant sections of the Environment Protection Act 1993.
- No licence or environmental authorisation was ever issued to operate a waste depot on the land under the South Australia Waste Management Commission Act 1979, the Waste Management Act 1987 or the Environment Protection Act 1993.
- In relation to the subject site, the EPA Public Register did not hold any information relating to:
  - Material or serious environmental harm caused or threatened in the course of an activity
  - Site contamination notified to the EPA under section 83A of the Environment Protection Act 1993
  - Environmental assessment report(s) or site contamination audit report(s).

A copy of the EPA Section 7 search for the site is provided in Appendix D.

## 4.4 Sands & McDougall

A search of the Sands & McDougall South Australian directories at 10-year intervals between the years 1864 and 1973 was undertaken. Table 3 lists businesses of potential environmental significance located on the streets surrounding the site, as identified during the directory search.

**Table 3: Sands & McDougall listed businesses of potential environmental significance**

Street name	Business listed (street number)	Approximate distance from site
Gameau Road	<ul style="list-style-type: none"> <li>Logan J J- Tyre Repairer (10)</li> <li>Moule R K- Diesel Mechanic (32)</li> </ul>	<ul style="list-style-type: none"> <li>0.2 km W-SW</li> <li>0.05 km N</li> </ul>
Lower North East Road	<ul style="list-style-type: none"> <li>Paradise Motors Service Station (738)</li> <li>Hoffman Dry Cleaners (610-616)</li> <li>Coin Op Laundry (634a)</li> </ul>	<ul style="list-style-type: none"> <li>1.2 km SE</li> <li>1.2 km S</li> <li>1.0 km S</li> </ul>
Main North East Road	<ul style="list-style-type: none"> <li>Hoffman Dry Cleaners (360c)</li> <li>Windsor Gardens Service Station (384-386)</li> <li>Dunlop Industrial Rubber Products Manufacturers (422)</li> <li>Lloyds Australia Ltd timber mechanists (432)</li> <li>Smith W P Auto Electric Service Pty Ltd (466a)</li> <li>Ampol Service Station (490)</li> <li>Peerless Dry Cleaners (490)</li> </ul>	<ul style="list-style-type: none"> <li>1.9 km W-NW</li> <li>1.7 km W-NW</li> <li>1.5 km NW</li> <li>1.4 km NW</li> <li>1.4 km NW</li> <li>1.3 km NW</li> <li>1.3 km NW</li> </ul>

## 4.5 EPA Site Contamination Index

All site contamination notifications and reports received since 1 July 2009 are recorded on the site contamination index, administered by the EPA. On 25 October 2018, the EPA site contamination index was searched for the suburbs of Paradise, Windsor Gardens and Campbelltown, with the following notifications considered relevant to the site.

- Audit Notification and Report, Sudholz Road, Windsor Gardens, 205 m north of site (10032 – 001)
- S83A Notification, 617-619 Lower North East Road, Campbelltown, 994 m south of site (60284 – 01) for service stations

No environmental protection and clean up orders were recorded for the site.

EPA search results for the site and surrounding land is provided in the Lotsearch report in Appendix A.



## 4.6 Site History Summary

Based upon the site history information reviewed and summarised in this report, the site history comprised the following:

- The site was used for rural residential and agricultural and horticultural purposes, including market gardens, from the early 1900s.
- A section of the northern portion of the site was developed in the 1960s with three buildings constructed (likely residential) fronting Gameau Road.
- The entire site was redeveloped in the 1980s into car park as part of the construction of the adjacent O'Bahn.

## 4.7 Summary of Potentially Contaminating Activities

A desktop assessment of PCAs and other activities of environmental interest (not defined as PCAs in the Environment Protection Regulations 2009 (EPR)) likely to have been undertaken at and surrounding the site and their likely significance with respect to site contamination is presented Table 4 below. Figure 1 outlines the approximate locations of these PCAs on site and within close proximity to site.

**Table 4: Potentially Contaminating Activities in immediate vicinity of the project site**

Potentially Contaminating Activity	Defined as PCA in the EPR (2009)	Potential Contaminants	Likely Location	Desktop risk assessment (considering proposed land use and redevelopment)
Fill or soil importation	Yes	Various, including: heavy metals, hydrocarbons (MAH and PAH), pesticides (arsenic), asbestos.	Across the site.	<p><b>Moderate</b></p> <p>It was likely that fill was imported to site for the construction of road and car park pavements across the central and southern portions of the site. It was also possible that some fill was brought to site for foundations and pavement layers associated with the former site buildings along the northern site boundary.</p> <p>The severity of contaminants in fill can be highly variable. In the event contaminated soils were brought to the site, there is potential for exposure risks to future site users.</p> <p>In addition, contaminated fill presents a potential waste liability should they become surplus to site requirements and incur higher disposal costs.</p>
Agricultural activities (applicable of pesticides)	Yes	Organochlorine pesticides	Shallow soils across the site	<p><b>Low</b></p> <p>Several early aerial photographs and information from Sands McDougall search register indicated the site and surrounds were likely used for agricultural purposes, including orchards and market gardens. Management of pesticides in the early 1900s varied and may have included application of pesticides to shallow soils. In the event pesticides were applied, there was potential for residual concentrations to exist within shallow soils that could pose a risk to future site users. This PCA was considered to be of low risk given the proposed land use.</p> <p>In addition, pesticide contamination of soils presents a potential waste liability should they become surplus to site requirements and incur higher disposal costs.</p>
Application of termiticides	No	Arsenic, copper, organochlorine pesticides	Shallow soils across northern boundary of site	<p><b>Low</b></p> <p>There is the potential for termiticides to have been applied to soils beneath and adjacent former buildings existing at the site in the 1950's and 1960s.</p> <p>In the event pesticides were applied, there was potential for residual concentration within shallow soils that could pose a risk to future site users. This PCA was considered to be of low risk given the proposed land use.</p> <p>In addition, termiticide contamination of soils presents a potential waste liability should they become surplus to site requirements and incur higher disposal costs.</p>

Potentially Contaminating Activity	Defined as PCA in the EPR (2009)	Potential Contaminants	Likely Location	Desktop risk assessment (considering proposed land use and redevelopment)
Building Demolition	No	Asbestos	Shallow soils across northern boundary of site	<p><b>Low</b></p> <p>Aerial imagery suggests that there were three former buildings along the northern border toward the east of the site that may have contained asbestos building materials. There is potential for demolition of these buildings in the 1970s and 1980s to have released asbestos cement sheeting and fibres into shallow soils. Free asbestos fibres in surface soils can pose an exposure risk to future site users. However, given the relatively small building footprint and subsequent development that has occurred in the general area, this PCA was considered to be of low risk.</p>
Asphalt pavements	No	PAHs and petroleum hydrocarbons.	Across majority of the site	<p><b>Low</b></p> <p>Asphalt car parking pavements and driveways existing in all areas of the site excluding the north-eastern portion of the site have the potential to cause PAH contamination, particularly if older pavements are not maintained. Residual PAH concentration within shallow soils can pose a risk to future site users.</p> <p>In addition, chemical and physical contamination of soils presents a potential waste liability should they become surplus to site requirements and incur higher disposal costs.</p>
Multiple offsite PCAs including service stations	Yes	TRH, VOCs, and other industrial chemicals	Groundwater	<p><b>Low</b></p> <p>There were several potential sources of groundwater contamination identified in the local area. These included service stations where poor storage and disposal of chemicals could lead to contamination of groundwater.</p> <p>In the event contamination of groundwater had occurred at the offsite properties, there is potential for contamination to migrate to the site and pose a risk to site users via extraction of groundwater (e.g. dewatering) and potential vapour intrusion into buildings and trenches/excavations.</p> <p>However, given the distance of these potential off-site sources from the site, the intended site configuration (largely open space), and absence of onsite extraction of groundwater, these offsite PCAs were considered to be of low risk for the site. In the event deep excavations or dewatering is necessary during construction works, further consideration to the assessment and management of groundwater may be necessary.</p>



## 5.0 INTRUSIVE CONTAMINATION ASSESSMENT METHODOLOGY

### 5.1 Sampling, Testing and Analysis Rationale

Investigation locations were positioned to achieve reasonable site coverage and to investigation PCAs identified at the site in the PSI. This included a total of 23 soil bore locations (BH01-BH15 and HA01-HA08), as shown on Figure 1.

Table 5 presents a summary of the soil sampling and analysis rationale for the investigation relative to the identified PCAs.

The investigation rationale was also intended to provide an indicative waste classification of soils for consideration of offsite disposal or reuse during the redevelopment.

**Table 5: Sampling and Testing Rationale**

Potentially Contaminating Activity	Location within site	Contaminants of interest	Boreholes Investigating PCA	Laboratory analysis of soil samples
Fill or soil importation	Across entire site	Various, including heavy metals, hydrocarbons and pesticides	BH01-BH15 and HA01-HA06	<ul style="list-style-type: none"> <li>■ heavy metals + cyanide</li> <li>■ polyaromatic hydrocarbons (PAH)</li> <li>■ total recoverable hydrocarbons (TRH)</li> <li>■ SA EPA waste screen (including heavy metals, PAH, TRH, organochlorine pesticides (OCP), polychlorinated biphenyls (PCB), semi volatile organic compounds (SVOC), and benzene, toluene, ethylbenzene and xylenes (BTEX)</li> </ul>
Agricultural activities (applicable of pesticides) – including within market gardens	Shallow soils across the site	Pesticides	BH01-BH15 and HA01-HA06	<ul style="list-style-type: none"> <li>■ OCP</li> </ul>
Application of termiticides	Shallow soils across northern boundary of site	Pesticides, arsenic and copper	BH01-BH15 and HA01-HA06	<ul style="list-style-type: none"> <li>■ heavy metals</li> <li>■ OCP</li> </ul>
Building Demolition	Shallow soils across northern boundary of site	Asbestos	HA08, BH08 and BH10	<ul style="list-style-type: none"> <li>■ Asbestos fibres</li> </ul>
Asphalt pavements	Across the central and southern portions of the site.	PAHs and petroleum hydrocarbons.	BH04, BH05 and BH06	<ul style="list-style-type: none"> <li>■ PAHs</li> <li>■ TRH</li> </ul>

## 6.0 SOIL SAMPLING METHODOLOGY

Prior to the commencement of fieldwork, Golder prepared a site-specific Health, Safety and Environment Plan (HSEP). The HSEP identified known hazards to the health and safety of project personnel and the environment.

Underground service plans were obtained to assist with locating underground infrastructure. Sampling locations were checked for the presence of buried services by a service location contractor prior to the commencement of the intrusive investigation.

The scope of the intrusive investigation was undertaken in general accordance with standard Golder field procedures, with reference (where applicable) to the following guideline documents:

- National Environmental Protection Council 1999 (amended 2013). National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM).
- Standards Australia 2005. Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-Volatile and Semi-Volatile Compounds. AS 4482.1-2005.
- Standards Australia 1999. Guide to the investigation and sampling of sites with potentially contaminated soil. Part 2: Volatile Substances. AS 4482.1-1999.
- Relevant Environment Protection Authority guidelines and site contamination information sheets.

The soil investigation methodology is summarised in the table below.

**Table 6: Summary of Soil Investigation Methodology**

Activity	Details
Soil sampling	<p>On 7 and 10 to 13 December 2018, the following soil investigations were undertaken:</p> <ul style="list-style-type: none"> <li>■ Two boreholes (BH03 and BH06) were drilled to depths of 15 m and 12 m bgl respectively using hollow auger techniques. These boreholes were also used to inform geotechnical investigations at the site.</li> <li>■ Eight boreholes (BH01-BH02, BH07-BH09, BH11, BH14 and BH15) were drilled to 2 m bgl using hollow auger techniques.</li> <li>■ Four boreholes were drilled to between 3.6 m (BH04) and 4 m bgl (BH05, BH10 and BH13).</li> <li>■ Borehole BH12 encountered auger refusal at 0.4 m bgl.</li> <li>■ Eight boreholes were hand augered to a maximum depth of 1.6 m bgl. Originally allocated to be mechanically drilled, these borehole locations were hand augered due to access restrictions.</li> </ul> <p>Soil cores recovered during the borehole drilling were removed from the sampling equipment and placed in a clean core tray.</p> <p>Soil samples were collected from regular depth intervals and from each soil profile identified. Samples were collected from the clean core tray during drilling.</p> <p>During borehole sampling, individual identification numbers were assigned to each sample collected, based on the borehole location ID, and the depth of the sample.</p>



Activity	Details
Soil gas screening	A calibrated Photo Ionisation Detector (PID) was used to screen samples collected for the presence of volatile organic constituents. Soil samples were placed into zip-lock plastic bags and allowed to equilibrate under ambient temperatures before PID measurements were undertaken.
Sample handling	Soil samples were handled by the Golder field representative and were stored in glass jars supplied by the laboratory. Disposable nitrile gloves were worn whilst handling samples and were replaced prior to the collection of each sample.
Decontamination of sampling equipment	Drilling equipment used to recover the soil samples and core trays used for storing samples were cleaned between sampling locations by scrubbing with phosphate free detergent solution, followed by a demineralised water rinse.
Quality control blanks and duplicate samples	Two intra-laboratory and two inter-laboratory duplicate samples were collected and tested to meet QC requirements. This is consistent with the recommendations in the ASC NEPM.
Soil logging	Soils encountered at each sampling location were logged in general accordance with Unified Soil Classification (USC) System. Soil logs are provided as Appendix E.
Sample preservation	Soil samples were stored under chilled conditions in a portable cooler prior to delivery to the laboratory. Sample transport was performed in accordance with Golder chain of custody procedures.
Soil bore abandonment	Soil boreholes backfilled using soil cuttings and cores.
Laboratory analysis	Soil samples were dispatched to NATA accredited laboratories (Eurofins and ALS) for chemical testing of a broad range of contaminants, as indicated in Table 5.

## 7.0 SCREENING CRITERIA

To assess the relative concentration and significance of potential contaminants detected through laboratory analysis it is best practice to reference established human health and environmental screening guidelines. These contaminant screening guidelines represent threshold concentrations of specific contaminants which, if exceeded, may pose a health or environmental risk and may therefore warrant further site-specific investigation or risk analysis.

All screening guidelines adopted for the assessment of the analytical results are presented in the chemical summary tables (Appendix F) and results exceeding the adopted guidelines have been highlighted.

### 7.1 Soil Assessment Guidelines

The following screening guidelines are referenced within this report to assist in the assessment of the significance of the chemical concentrations detected in site soil.

#### 7.1.1 Human Health Screening Guidelines

The NEPM (1999, amended 2013) provides a nationally consistent framework for assessing site contamination. The NEPM methodology is based on assessing the potential for an unacceptable risk to human health or the environment by comparing concentrations of chemical substances to conservative, generic investigation levels for various environmental settings and land use scenarios.

The site is proposed to be redeveloped as an operational car park and bus station. On this basis, NEPM health investigation level (HIL) 'D' for generic commercial/industrial land use was adopted.

The NEPM health screening levels (HSLs) for vapour intrusion and Management Limits for petroleum hydrocarbon compounds were also considered for this investigation, however have not been presented in the summary tables due to the absence of detectable petroleum hydrocarbon concentrations.

#### 7.1.2 Ecological Screening Guidelines

The NEPM also provides ecological investigation levels (EILs) and ecological screening levels (ESLs) to assess potential impacts on ecological receptors in soils.

The ESLs have been developed for selected petroleum hydrocarbon compounds and petroleum hydrocarbon fractions. The ESLs were considered in this assessment were for coarse grained soils, in a commercial/industrial use setting.

The EILs presented in this report were calculated from parameters that were conservatively estimated based on fieldwork observations and laboratory chemical data. A number of factors were considered in determining EIL values for the site including – reasonable assumptions made regarding the age of the contamination, the location of the site and the expected traffic volume close to the site. These values are typically only applicable to the top 2 metres of the soil profile where plants (and to a lesser degree animals) are likely to interact with the soil.

The EILs are calculated to take account of relationships between metal toxicity and the soil physicochemical characteristics of pH, percent clay, organic carbon content (OC) and cation exchange capacity (CEC).

EILs were estimated using the EIL calculation spreadsheet provided in the Assessment of Site Contamination NEPM toolbox (accessible from <http://www.scew.gov.au/node/941>). The resulting EIL guideline values are presented in Table 7 below.

**Table 7: EIL calculation inputs and results**

Inputs	
Site Characteristics	<ul style="list-style-type: none"> <li>any contamination is 'aged' (older than two years)</li> <li>the site is in South Australia</li> <li>the traffic volume is high (greater than 200 cars an hour within 50 m of the location)</li> </ul>
Estimated Physicochemical characteristics (moderately conservative)	<ul style="list-style-type: none"> <li>TOC: 0.25%</li> <li>CEC: 10 meq/100g</li> <li>pH: 7</li> <li>Clay content: 15%</li> </ul>
EILs generated	
Generic EILs	<ul style="list-style-type: none"> <li>Arsenic = 160 mg/kg</li> <li>Lead = 1800 mg/kg</li> <li>Naphthalene = 370 mg/kg</li> <li>DDT = 640 mg/kg.</li> </ul>
Soil type specific EILs	<ul style="list-style-type: none"> <li>Copper = 160 mg/kg</li> <li>Nickel = 290 mg/kg</li> <li>Chromium = 770 mg/kg</li> <li>Zinc = 720 mg/kg</li> </ul>

### 7.1.3 Waste disposal classification

The criteria used to assess the suitability of soils for off-site disposal were those set in the EPA information sheet *Current Criteria for the Classification of Waste including Commercial and Industrial Waste (Listed) and Waste Soil*, dated March 2010.

The waste soil classifications, listed by severity of contamination from lowest to highest, are:

- Waste Fill (WF)
- Intermediate Waste Soil (IWS)
- Low-Level Contaminated Waste (LLCW).

Maximum permissible concentrations of these waste classifications are referred to collectively as the soil disposal criteria and are presented in soil chemical summary tables in Appendix F.



## 8.0 RESULTS

The following section summarises the field observations and results of the laboratory soil testing. Soil sampling locations are presented on Figure 1. Tabulated laboratory soil testing results are presented in Appendix F.

### 8.1 Field Observations – Surface and Subsurface Conditions

Descriptions of the ground conditions encountered, and depth intervals identified are summarised in the borehole logs presented in Appendix E. Our explanatory sheets on Terms and Abbreviations and the Method of Classification used in preparing the Borehole Logs are also included.

General conditions are summarised as follows:

- **Fill:** Fill was encountered at 17 of the 23 borehole locations to depths ranging between 0.2– 3.0 m and was logged as sandy gravel, clayey gravel, gravelly clay and clay. Trace brick fragments were observed in one borehole (BH08) at 0.3 m bgl. Trace metal fragments were observed in one hand auger hole (HA02) at depths between 0.4 and 0.6 m bgl.
- **Natural Soil:** Natural soil was encountered beneath fill at 12 sampling locations and from ground surface at six sampling locations to a maximum depth of 15 m bgl (BH03). Natural soil was described as:
  - low to medium plasticity clay from approximately 0 m to between 2.5 and 3 m bgl, overlying;
  - clayey to silty sand from approximately 2.5 to 3 m bgl to between approximately 5 to 5.5 m bgl overlying;
  - sandy gravel and silty sand to 10 m bgl, overlying;
  - medium plasticity clay to 15 m bgl.

The natural soil encountered was generally consistent with published geological maps for the area.

No staining or odours were observed in soils at the site and no potentially asbestos containing materials were observed during the intrusive investigation.

### 8.2 Soil Gas Screening

The soil gas (PID) results were reported at 0 ppm.

### 8.3 Soil Analytical Results

Chemical data summary tables are presented in Appendix F, with exceedances of health and ecological guidelines and waste disposal criteria highlighted. Laboratory certificates and chain of custody documentation are presented in Appendix G.

#### 8.3.1 Metals

A total of 47 samples were tested for heavy metals.

All samples had concentrations compliant with the adopted human health screening levels.

All results were also compliant with the adopted ecological screening levels with the exception of the concentration of copper (5,900 mg/kg) in BH15/03 (0.75-1.0 m bgl) that exceeded the NEPM EIL guideline value (160 mg/kg). Chemical testing of the underlying sample (BH15/04, 1.0-1.2 m bgl) indicated a copper concentration of 32 mg/kg, less than the EIL.

The majority of samples had concentrations compliant with the waste fill (WF) criteria, with exception of six samples. These were:

- The concentration of manganese in BH03/01 at 0.5-0.55 m bgl (600 mg/kg) and BH04/01 at 0.1-0.3 m bgl (520 mg/kg) exceeded the criteria for WF (500 mg/kg). Both were compliant with the IWS criterion of 6,000 mg/kg. Statistical assessment of the manganese concentrations across all samples tested indicated a 95% UCL of 373.2 mg/kg and compliant with the WF criterion.
- The concentration of copper in BH15/03 at 0.75-1.0 m bgl (5,900 mg/kg) exceeded the criteria for WF (60 mg/kg) and IWS (2,000 mg/kg).

### 8.3.2 Polycyclic Aromatic Hydrocarbons (PAH)

A total of 26 samples were tested for PAH. These samples had concentrations compliant with the adopted human health and ecological screening levels.

The majority of samples had PAH concentrations compliant with the waste fill criteria, with exception of the total PAH concentrations in BH08/02 at 0.35-0.55 m bgl (5.6 mg/kg) and BH15/02 at 0.2-0.5 m bgl (6.6 mg/kg) that exceeded the waste fill criterion (5 mg/kg). These were compliant with the IWS criterion of 40 mg/kg.

Statistical assessment of the total PAH concentrations across all samples tested indicated a 95% UCL of 1.7 mg/kg and compliant with the WF criterion.

### 8.3.3 Organochlorine Pesticides (OCPs)

A total of 27 samples were tested for OCPs. Although several samples had concentrations of some OCPs above the laboratory LOR, these were compliant with the adopted human health and ecological screening levels.

The majority of samples had concentrations compliant with the waste fill criteria, with exception of the total chlordane concentrations in BH08/02 at 0.35-0.55 m bgl (4.8 mg/kg) that exceeded the WF and IWS criteria (2 mg/kg). This concentration was compliant with the LLCW criterion of 50 mg/kg.

### 8.3.4 Total recoverable hydrocarbons (TRH) and BTEX

A total of 26 samples were tested for TRH and BTEX. Although several samples had concentrations of TRH above the laboratory LOR, these were less than the adopted human health screening levels. The majority were less than the adopted ecological screening levels, with the only exception being TRH >C10-C16 in sample BH01/01 at 0.05-0.35 m bgl (230 mg/kg), marginally above the EIL of 170 mg/kg.

The majority of samples had concentrations compliant with the waste fill criteria, with exception of the TRH (C10-C40) concentration in BH01/01 at 0.05-0.35 m bgl (1,660 mg/kg) that exceeded the WF and IWS criterion (1,000 mg/kg). This concentration was compliant with the LLCW criterion of 10,000 mg/kg.

Statistical assessment of the TRH C10-C36 concentrations across all samples tested indicated a 95% UCL of 400.4 mg/kg and compliant with the WF criterion.

### 8.3.5 Phenolics compounds

Four samples were tested for phenolic compounds. Concentrations did not exceed the laboratory LOR. These concentrations were less than the adopted human health and ecological screening levels, as well as the waste fill criteria.

### 8.3.6 SA EPA Waste Screen

Four soil samples were tested for a broad screen analysis, which included heavy metals, hexavalent chromium cyanide, TRH, BTEX, PAH, OCP, PCB, PCE and phenols. Other than metals, PAHs and TRH as discussed above, concentrations of all other listed chemicals did not exceed laboratory LOR. These concentrations were less than the adopted human health and ecological screening levels, as well as the waste fill criteria (where available).

## 8.4 Leachability Results

Due to copper and manganese concentrations in several samples exceeding the waste fill criterion, ASLP leachability testing was undertaken in accordance with landfill licensing requirements. The soil sample with the highest concentrations for manganese (BH03\_E\_01\_0.05-0.55) and copper (BH15/03 0.75-1.0) were selected for ASLP testing (pH 5). The leachable concentration of manganese in sample BH03\_E\_01\_0.05-0.55 (0.43 mg/L) and copper in sample BH15/03 0.75-1.0 (<0.01 mg/L) did not exceed the SA EPA leachability criterion for intermediate waste soil (50 mg/L and 10 mg/L respectively). Leachability results are provided in the laboratory certificates of analysis (Appendix G).

## 8.5 Soil Data Quality Validation

An evaluation of the quality of the laboratory testing data for soil samples collected at the site is provided below.

As part of the evaluation of laboratory chemical data, duplicate pair results were compared by determining the relative percentage difference (RPD) between the results. According to AS4482.1-2005 and the ASC NEPM, a soil RPD within the range of -30% to 30% is considered to show acceptable agreement and, conversely, data is considered to have poor agreement where an RPD is outside this range.

The results of internal laboratory quality control procedures are provided within the laboratory certificates (Appendix G). The acceptance criterion for internal laboratory replicates is set at an RPD of -30% to 30%. Laboratory recoveries should be in the range 70% to 130%.

Table 8 summarises conformance to specific QA/QC requirements for soil laboratory testing data. Duplicate sample results are presented in Appendix F.



**Table 8: Soil Data Validation**

QA/QC Requirement	Compliant	Comments
Chain of custody documentation completed	Yes	All samples were transported under strict Golder chain of custody procedures.
Samples delivered to laboratory within sample holding times and with correct preservative	Yes	All samples were delivered to the laboratories within the sample holding times and in laboratory supplied containers prepared with the appropriate preservative (where required).
All analyses NATA accredited	Yes	The laboratories (Eurofins and ALS) were NATA accredited for all the analyses performed.
Intra-laboratory field duplicate testing frequency of at least 5% (1 in 20)	Yes	<p>Three intra-laboratory field duplicate samples were submitted for laboratory testing of chemicals of concern including metals, PAH and TRH. This provided a duplicate testing frequency of 1 duplicate per 17 primary tests.</p> <p>The intra-laboratory duplicate testing ratios were in accordance with the recommendations in AS4482.1-2005 and the NEPM.</p>
Inter-laboratory field duplicate testing frequency of at least 5% (1 in 20)	Yes	<p>Three inter-laboratory field duplicate samples were submitted for laboratory testing of chemicals of concern including metals, PAH, and TRH. This provided a duplicate testing frequency of 1 duplicate per 17 primary tests.</p> <p>The inter-laboratory duplicate testing ratios were in accordance with the recommendations in AS4482.1-2005 and the NEPM.</p>
Intra-laboratory field duplicate samples reported RPDs within +/-30% set by AS4482.1-2005	Majority	<p>Across the three intra-laboratory duplicate sample pairs tested, 254 of 269 analyte comparisons indicated RPDs within +/-30%. Minor exceptions were for several heavy metals as well as moisture. These minor discrepancies were likely to be due to heterogeneity of analytes in fill materials and all RPDs were less than 70%. Multiple RPDs were unable to be calculated due to one or both samples being below laboratory LOR.</p> <p>Overall the analyte pair RPD results indicated good data correlation between the primary results and intra-laboratory duplicate results.</p>
Inter-laboratory field duplicate samples reported RPDs within 30%-50% set by AS4482.1-2005	Majority	<p>Across the three inter-laboratory sample pairs tested, the 207 of 218 analyte test comparisons indicated RPDs within +/-30%. Minor exceptions were for several heavy metals. These minor discrepancies were likely to be due to heterogeneity of analytes in fill materials and all RPDs were less than 55%.</p>

QA/QC Requirement	Compliant	Comments
		<p>Multiple RPDs were unable to be calculated due to one or both samples being below laboratory LOR.</p> <p>Overall the analyte pair RPD results indicated good data correlation between the primary results and duplicate results.</p>
Equipment Blanks frequency of at least 1 per batch	Yes	Two equipment rinse blank samples (R-01 and R-02) were recovered and tested to demonstrate the effectiveness of the decontamination method.
Equipment Blank results below LOR.	Yes	The equipment rinse blanks indicated concentrations of heavy metals were below the laboratory LORs. These results demonstrated that the equipment decontamination method was adequate. Equipment blank results are presented on table in Appendix F and in the laboratory certificates of analysis in Appendix G.
Acceptable laboratory QC results	Yes	<p>The majority of laboratory QC test results were within acceptable limits. Minor exceptions included spike recoveries for manganese and zinc, as well as internal lab duplicate RPDs for boron, some PAHs and 4,4 DDT in Eurofins lab report 633414.</p> <p>Further information with respect to internal laboratory QC results (i.e. control blanks, laboratory recoveries and RPD results) can be found in the laboratory certificates of analysis, provided in Appendix G.</p>

Based on the assessment methodologies employed and the QC data obtained, the overall quality of the data is considered acceptable.

## 9.0 CONCLUSIONS

PTPA commissioned Golder to undertake a Factual DSI for the O-Bahn Park 'n' Ride Paradise Interchange project site located at Lot 100 Darley Road, Paradise (the site).

The objectives of the desktop assessment were to:

- Research current and historical land uses, and associated activities undertaken at or adjacent to the site to identify whether potentially contaminating activities (PCAs), defined in the Environment Protection Regulations 2009, may have occurred on or near the site;
- Provide a desktop assessment of risk based on the likelihood that PCAs could have caused site contamination, with consideration of the proposed land use; and
- Inform the rationale and design of the intrusive soil contamination investigation.

The objectives of the intrusive soil contamination investigation were to:

- Assess the contamination status of the site based on the historical land use, in the context of the proposed development;
- Characterise the nature and extent of site contamination in accordance with the ASC NEPM; and
- provide indicative waste classification of soil in areas proposed for excavation.

### 9.1 Desktop Assessment

Based on the findings of the desktop assessment, as well as a site visit, Golder concludes the following:

- Potentially Contaminating Activities (PCAs), as defined by the Environment Protection Regulations 2009, as well as other activities of potential significance, identified to have likely occurred onsite included:
  - Fill or soil importation – moderate risk
  - Agricultural activities (applicable of pesticides) – low risk
  - Application of termiticides – low risk
  - Building Demolition (asbestos debris) – low risk
  - Asphalt pavements – low risk
- Several offsite PCAs were identified surrounding the site including service stations. These offsite PCAs were considered to be of low risk given the open nature of the site (no buildings) and the unlikely need to extract onsite groundwater for use.
- Based on the identified history of the site and surrounding area there was a variety of contaminants of interest that could be present within soils at the site, including (but not limited to) heavy metals, pesticides, PAH, and asbestos fibres.

### 9.2 Intrusive Soil Assessment

Intrusive soil investigations were undertaken to characterise the contamination status of site soils, with consideration of contaminants of interest identified in the desktop assessment presented here-in. The investigation would also inform an indicative waste classification of site soils should materials become surplus to site requirements.



Investigation works included the drilling of 23 soil bores and collection of soil samples for chemical testing of contaminants of interest. Based on the soil contamination investigations undertaken, the following key findings were made:

- Soil concentrations of contaminants of interest in samples tested were less than the adopted human health screening levels.
- The majority of soil concentrations of contaminants of interest in samples tested were less than the adopted ecological health screening levels with the exception copper in fill at BH15 (0.75-1.0 m bgl, 5,900 mg/kg) and TRH >C10-C16 in shallow fill at BH01 (0.05-0.35 m bgl, 230 mg/kg) that exceeded the NEPM EIL guideline values (160 mg/kg and 170 mg/kg, respectively).
- Concentrations of the majority of contaminants of interest in soil samples tested were less than the waste fill limit. Exceedances of the waste fill limit included elevated concentrations of manganese and TRH in fill in the south-western portion of the site (BH01, BH03 and BH04), and copper, total PAH and chlordane in fill in the eastern portion of the site BH08 and BH15). Statistical assessment across the entire set of testing results indicated the 95% upper confidence limit for manganese, TRH and total PAH would be compliant with the waste fill limit.
- With regards to the assessment of soils for consideration of offsite disposal, the following indicative waste classifications have been provided. A more refined waste classification may be possible upon the provision of information regarding the specific size, location and depth of excavations relative to the borehole locations assessed. Indicative classifications for site soils are as follows:
  - Fill materials in the vicinity of BH15 (extending to 1.0 m bgl) would be classified as Low Level Contaminated Waste.
  - Fill materials in the vicinity of BH08 (extending to 0.65 m bgl) would be classified as Low Level Contaminated Waste.
  - Fill materials in the vicinity of BH01, BH03 and BH04 (extending to 0.3 m bgl) did have marginally elevated concentrations of manganese and total recoverable hydrocarbons. Statistical consideration of these results in context with the site-wide data set suggested it was compliant with the Waste Fill. However should fill be excavated from these portions of the site in isolation from the rest of the site, the waste classifications may be Intermediate Waste (BH03 and BH04) or Low Level Contaminated Waste (BH01).
  - Fill materials elsewhere across the site would be classified as Waste Fill.
  - Natural soils across the entire site would be classified as Waste Fill.

The indicative waste classifications provided above are relevant to offsite disposal of materials to an appropriately licenced waste facility. The materials may also be suitable for offsite reuse as Waste Derived Fill (WDF). Waste Fill compliant soils can be reused as WDF at a non-sensitive land use site. Reuse of Intermediate Waste Soils as WDF requires the receiving site to be non-sensitive land use and the transaction must be approved by an EPA accredited Site Contamination Auditor. Further details regarding reuse of materials as WDF is provided in the *Standard for the production and use of Waste Derived Fill* (EPA 2013).

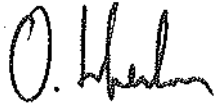
A groundwater assessment was not undertaken as part of this investigation. In the event that groundwater is proposed to be extracted at the site, appropriate assessment of the groundwater should be undertaken to determine whether it is fit for purpose prior to use or disposal.

## 10.0 IMPORTANT INFORMATION

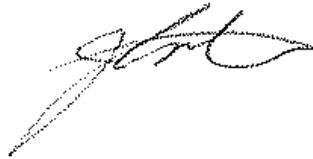
Your attention is drawn to the document – “Important Information”, which is included in Appendix H of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Golder Associates, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

## Signature Page

### Golder Associates Pty Ltd



Owen Hender  
*Environmental Engineer*



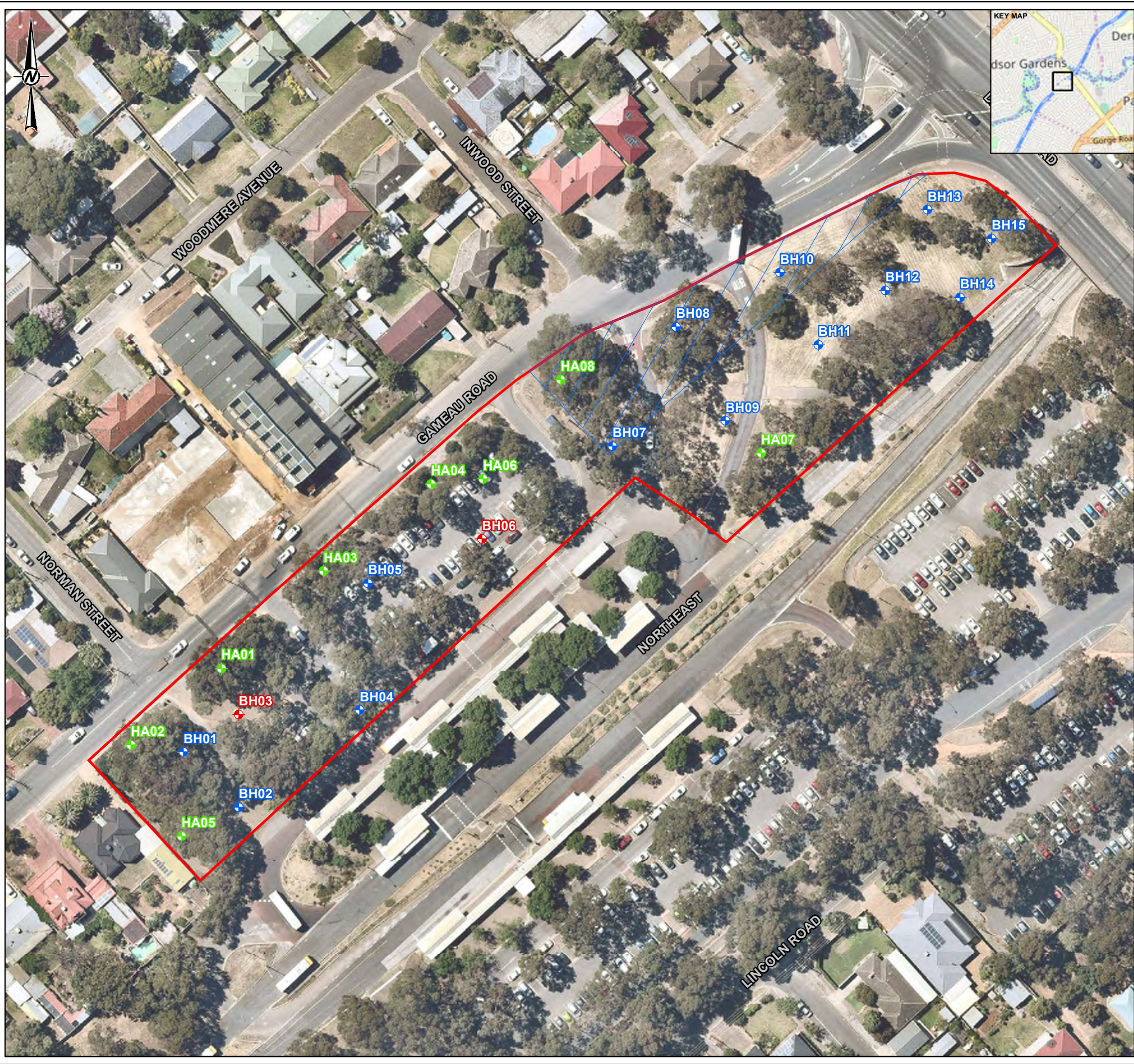
James Corbett  
*Principal Environmental Engineer*

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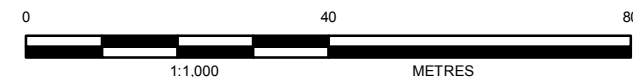
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#### LEGEND

- Approximate Site Boundary
- Approximate location of former housing (1960 - 1980)
- Approximate Borehole Location
- Approximate Deep Borehole
- Approximate Hand Auger Location



NOTE(S)  
1. AERIAL PHOTOGRAPH SOURCED FROM NEARMAP. DATE OF CAPTURE 13/01/2013. RESOLUTION 15CM.

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CLIENT  
PUBLIC TRANSPORT PROJECTS ALLIANCE (PTPA)

PROJECT  
PARADISE GEOTECHNICAL AND CONTAMINATION INVESTIGATION

TITLE  
SITE FEATURES AND PROPOSED BOREHOLE LOCATION PLAN

CONSULTANT	DD-MM-YYYY	17-01-2019
	DESIGNED	JL
	PREPARED	-
	REVIEWED	OH
	APPROVED	THH

PROJECT NO.  
1788739

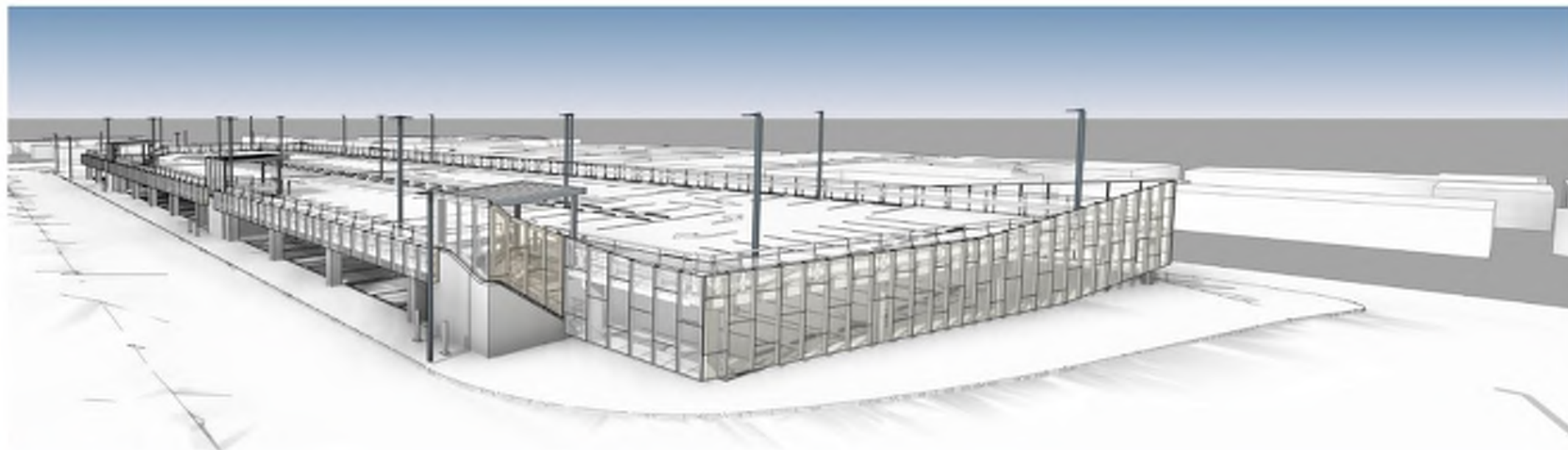
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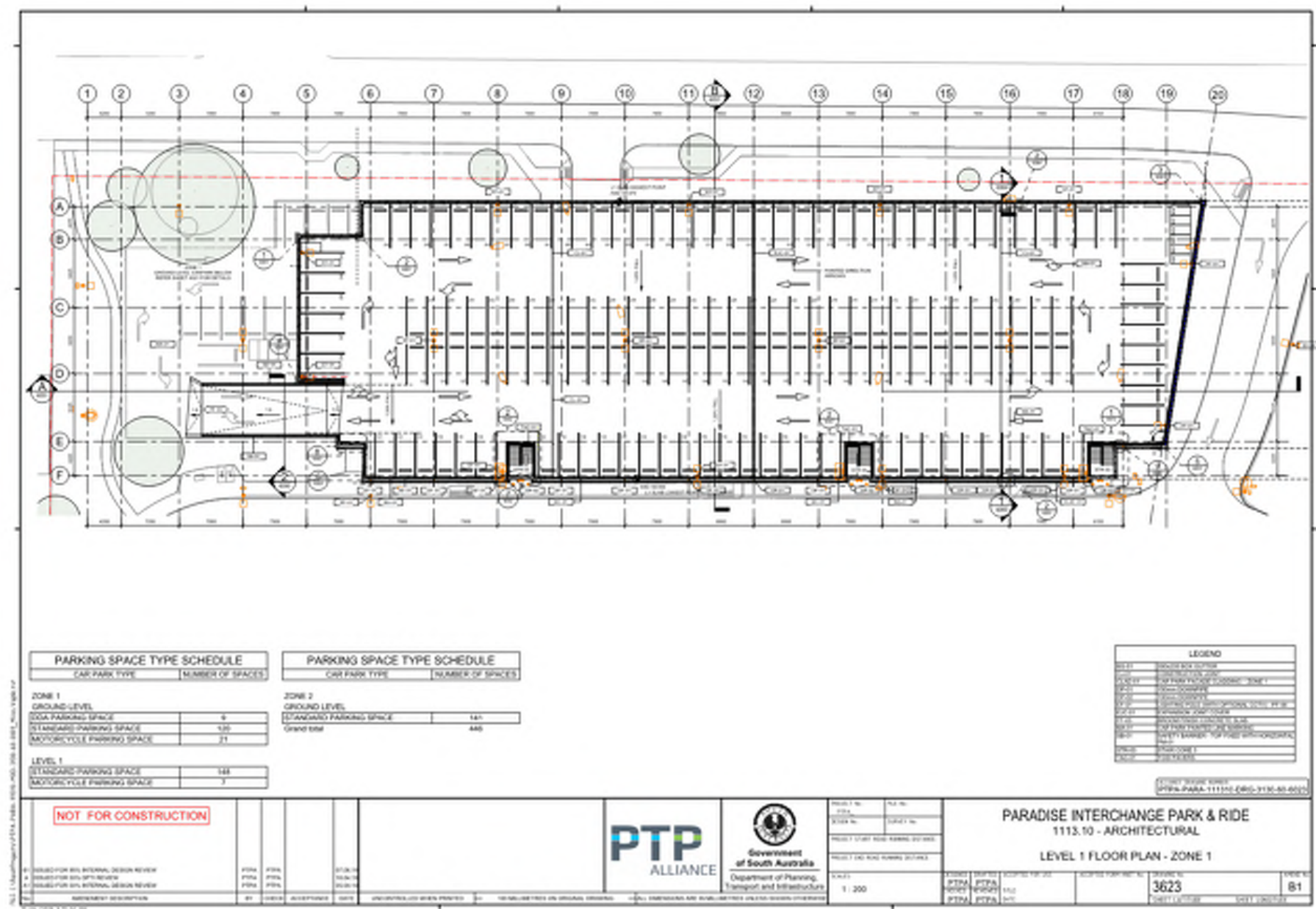
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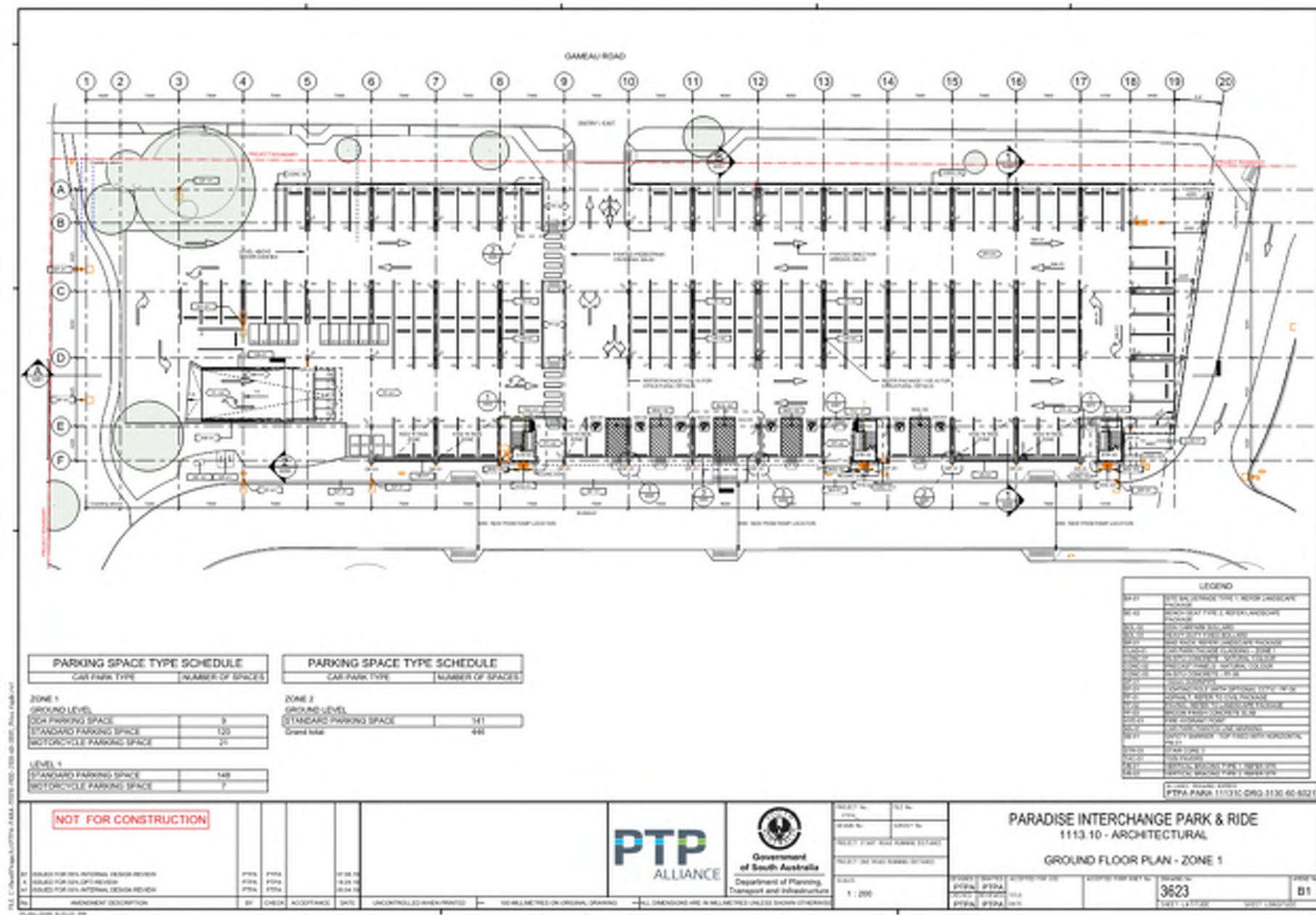


## **Attachment 11: Architectural Design Drawings**















**Attachment 12: EBS Ecology Fauna Assessment Report (22/02/2019)**



# **Fauna Assessment**

## **Paradise Interchange**

# Fauna Assessment Paradise Interchange

22 February 2019

Version Final

Prepared by EBS Ecology for PTPA

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**CITATION:** EBS Ecology (2019) Fauna Assessment Paradise Interchange. Report to PTPA. EBS Ecology, Adelaide.

Cover photograph: A mix of *Corymbia citriodora* (Lemon-scented Gum), *C. maculata* (Spotted Gum) and *Eucalyptus camaldulensis* (River Red Gum) in the Project area.

EBS Ecology  
125 Hayward Avenue  
Torrensville, South Australia 5031  
t: 08 7127 5607  
<http://www.ebsecology.com.au>  
email: [info@ebsecology.com.au](mailto:info@ebsecology.com.au)





## GLOSSARY AND ABBREVIATION OF TERMS

ALA	Atlas of Living Australia
AMLR NRM	Adelaide Mount Lofty Ranges Natural Resource Management Region
DEWNR	Department of Environment, Water and Natural Resources (now known as the Department of Environment and Water (DEW)).
DPTI	Department of Planning, Transport and Infrastructure
EBS	EBS Ecology
NatureMaps	Initiative of DEW that provides a common access point to maps and geographic information about South Australia's natural resources in an interactive online mapping format
<i>EPBC Act</i>	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
<i>NPW Act</i>	<i>National Parks and Wildlife Act 1972.</i>
<i>Pers. Comm.</i>	Personal Communication
Pers. Obs	Personal Observation
PTPA	Public Transport Projects Alliance
SA	South Australia / South Australian

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# 1 INTRODUCTION

EBS Ecology (EBS) were engaged by Public Transport Projects Alliance (PTPA) to provide commentary on threatened fauna habitat in accordance with Department of Planning, Transport and Infrastructure (DPTI) Fauna Impact Assessment Guidelines.

## 1.1 Project area

The Project area is located at the Paradise interchange, located south of Gameau Road in the suburb of Paradise, Adelaide, South Australia (Figure 1). The site falls within the Campbelltown District Council area and the Adelaide Mount Lofty Ranges Natural Resource Management (AMLR NRM) Region.

## 1.2 The Project

The primary objective of the works at the Paradise Park n Ride is to increase the number of parking spaces available for passengers, with the secondary objective of improving the passenger accessibility at the interchange. It is proposed that this will be undertaken through the development of a multi-storey car park. A location plan and plan of the study boundary for the Paradise Park n Ride is provided in Figure 1.





Figure 1. The Paradise Park n Ride Project area.

## 2 METHODS

Prior to the threatened fauna assessment, arborists recorded the location, species, dimensions and condition of each individual tree within the Project area (Arborman Tree Solutions 2019).

EBS then used the DPTI template to determine the importance of scattered trees for threatened fauna within the Project area, using the *Threatened Fauna Habitat Assessment method* (DEWNR 2015). Each tree was scored for:

- Dieback: the percentage (%) of the tree crown that is dead;
- Hollows: the number and size of available hollows;
  - 1 = no hollows visible
  - 2 = one to four small (<100 mm) or one medium (100 – 150 mm)
  - 3 = more than five small, more than two medium or one or more large (>150 mm) or one to four small and one medium
- Suitability for threatened species;
  - 1 = common only
  - 2 = one uncommon (at regional, state or national level)
  - 3 = at least two uncommon or one or more rare species (at regional, state or national level)
- Density; and
  - 1 = More than 50 m or two trees less than 50 m apart but more than 50 m away from other trees
  - 2 = Three or more trees within at least 5-50 m of at least one other tree in the group or two trees less than 5 m apart, with at least one being within 5-50 m of another tree
  - 3 = Three or more trees each within 5 m of at least one other tree in the group
- Proximity to native vegetation (>1 ha patch).
  - 1 = 200 m or more
  - 2 = 50-200 m
  - 3 = within 50 m

The suitability of each tree for use by threatened species was determined by desktop searches, literature review and visual inspection during the field survey. The occurrence of species threatened at National, State and Regional level within the Project area were determined by obtaining records from NatureMaps, that were filtered to only include records from the past 20 years and that have high spatial accuracy. Additionally, the Atlas of Living Australia (ALA) was used to identify additional threatened species within 5 km of the Project area that were likely to occur in the Project area, however, were not identified in the NatureMaps search.

The suitability of an individual tree for use by threatened species were determined by assessing the species of tree and its structure, including height, spread, robustness of lateral branches and the presence of low lateral branches.

The matrix used to assign a suitability for threatened species use score is shown in Table 1.

Opportunistic observations of fauna were also recorded during the assessment.

**Table 1. The scores allocated to a tree based upon its potential use by threatened species at regional, state or national level.**

Score	Threatened species use
1	None (common species only)
2	One uncommon/near-threatened species (at regional, state or national level)
3	At least two uncommon/ near-threatened or one rare species (at regional, state or national level)



### 3 RESULTS

The results for the presence of hollows, dieback, density and proximity to native vegetation are entered in to the DPTI Spreadsheet to determine an impact calculation with offset requirements (Attachment 1). The following results focus on the suitability for threatened fauna scored.

#### 3.1 Threatened Species

One Nationally threatened, one State threatened, and six Regionally threatened and near-threatened fauna species may use the scattered trees within the Project area for nesting, foraging and/or perching (resting and surveillance of prey) (Table 2).

The threatened fauna species recorded within the NatureMaps search that are unlikely to occur within the Project area or do not utilise scattered trees are presented in Appendix 1.

**Table 2. Nationally, State and Regionally threatened fauna species that have been recorded within 5 km of the Project area and have potential to use the scattered trees proposed for clearance (NatureMaps 2019; ALA 2019).**

Common name	Species name	Aus	SA	Bio-region AMLR	Data source
Common Brushtail Possum	<i>Trichosurus vulpecula</i>		R	RA	1
Common Ringtailed Possum	<i>Pseudocheirus peregrinus</i>			RA	2
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	VU	R	RA	1
Silvereye	<i>Zosterops lateralis</i>			VU	1
Southern Boobook	<i>Ninox boobook</i>			NT	1
Tawny Frogmouth	<i>Podargus strigoides</i>			NT	1
Tree Martin	<i>Petrochelidon nigricans</i>			NT	1
Willie Wagtail	<i>Rhipidura leucophrys</i>			NT	1

#### **Conservation status**

**Aus:** Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA:** South Australia (*National Parks and Wildlife Act 1972*). **Bio-region:** Adelaide Plains and Mount Lofty Ranges. **Conservation Codes:** **CE:** Critically Endangered. **ENE:** Endangered. **VU/V:** Vulnerable. **R/RA:** Rare. **NT:** Near threatened.

#### 3.2 Suitability for threatened species use

The allocation of a score for the use of each scattered tree by threatened fauna species was determined by the tree species, canopy spread and canopy structure (Table 3).

Table 3. Allocation of threatened species scores for each tree species based upon its canopy spread and canopy structure.

Tree Species	Canopy spread	Suitability for Threatened Species Score*	Threatened or uncommon species
<i>Corymbia citriodora</i>	<5 m with no low lateral branches	1	None
	<5 m with low lateral branches	2	Willie Wagtail
	>5 m and >10 m	3	Common Brush-tailed Possum, Common Ringtail Possum, Grey-headed Flying Fox, Southern Boobook, Tawny Frogmouth, Tree Martin
<i>Corymbia maculata</i>	<5 m	1	None.
	>5 m with thin structure	1	None.
	>5 m with low lateral branches but poor structure	2	Willie Wagtail
	>5 m with good canopy structure	3	Common Brush-tailed Possum, Common Ringtail Possum, Grey-headed Flying Fox, Southern Boobook, Tawny Frogmouth, Tree Martin
	>10 m and >15 m	3	Common Brush-tailed Possum, Common Ringtail Possum, Grey-headed Flying Fox, Southern Boobook, Tawny Frogmouth, Tree Martin
<i>Eucalyptus camaldulensis</i>	<5 m	1	None
	<5 m with low lateral branches	2	Willie Wagtail
	>5 m with thin canopy structure	2	Willie Wagtail
	>5 m with good canopy structure, >10 m, >15 m and >20 m	3	Common Brush-tailed Possum, Common Ringtail Possum, Grey-headed Flying Fox, Southern Boobook, Tawny Frogmouth, Tree Martin
<i>Eucalyptus campaspe</i>	>5 m	2	Willie Wagtail
<i>Eucalyptus cladocalyx</i>	>10 m	3	Common Brush-tailed Possum, Common Ringtail Possum, Grey-headed Flying Fox, Southern Boobook, Tawny Frogmouth, Tree Martin
<i>Eucalyptus leucoxylon</i>	<5 m with no low lateral branches	1	None
	<5 m with low lateral branches	2	Willie Wagtail
	>5 m dead	1	None
	>5 m alive, >10 m and >15 m	3	Common Brush-tailed Possum, Common Ringtail Possum, Grey-headed Flying Fox, Southern Boobook, Tawny Frogmouth, Tree Martin
<i>Fraxinus angustifolia</i> ssp. <i>angustifolia</i>	<5 m	1	None
Weed Group – 124	>15 m wide patch. Closed structure, many native shrubs.	3	Silvereye, Willie Wagtail

Tree Species	Canopy spread	Suitability for Threatened Species Score*	Threatened or uncommon species
Weed Group – 125	>15 m wide patch. Closed structure, many native shrubs	3	Silvereye, Willie Wagtail
Weed Group – 126	>15 m wide patch. Open structure, few native shrubs	2	Willie Wagtail

\* Suitability scores are explained in Table 1.

Native trees with a canopy spread >5 m and with good canopy structure may provide habitat for Common Brush-tailed Possums (*Trichosurus vulpecula*), Common Ringtail Possums (*Pseudocheirus peregrinus*), Grey-headed Flying Foxes (*Pteropus poliocephalus*), Southern Boobooks (*Ninox boobook*), Tawny Frogmouths (*Podargus strigoides*) and Tree Martins (*Petrochelidon nigricans*). While those with a canopy spread of <5 m but with low lateral branches may provide habitat for Willie Wagtails (*Rhipidura leucophrys*). Trees, native and exotic, with a canopy spread of <5m and an absence of low lateral branches were not considered to support threatened or uncommon fauna species.

The Weed groups 124 and 125 may support habitat for Silvereyes (*Zosterops lateralis*) and Willie Wagtails due to the high density of exotic shrubs (e.g. Olives (*Olea europaea*) and the presence of some especially native shrubs (such as the *Myoporum* sp), that offer cover and the presence of food plants. Weed Group 126 had an open structure and was predominantly comprised of weed species. As such, this weed group only may only support habitat for the Willie Wagtail.

The locations of trees and weed groups mapped as per their threatened species score are shown in Figure 2 and Figure 3.

### 3.3 Opportunistic observations

Five bird species were recorded within the Project area during the tree assessment. All the species recorded are very common and have a conservation rating of least concern within the AMLR bio-region (Table 5).

**Table 4 Opportunistic fauna sightings in the Project area.**

Species name	Common name	Aus	SA	Bio-region (AMLR)
<i>Glossopsitta concinna</i>	Musk Lorikeet			LC
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater			LC
<i>Manorina melanocephala</i>	Noisy Miner			LC
<i>Gymnorhina tibicen</i>	Australian Magpie			LC
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet			LC

**LC:** Least Concern



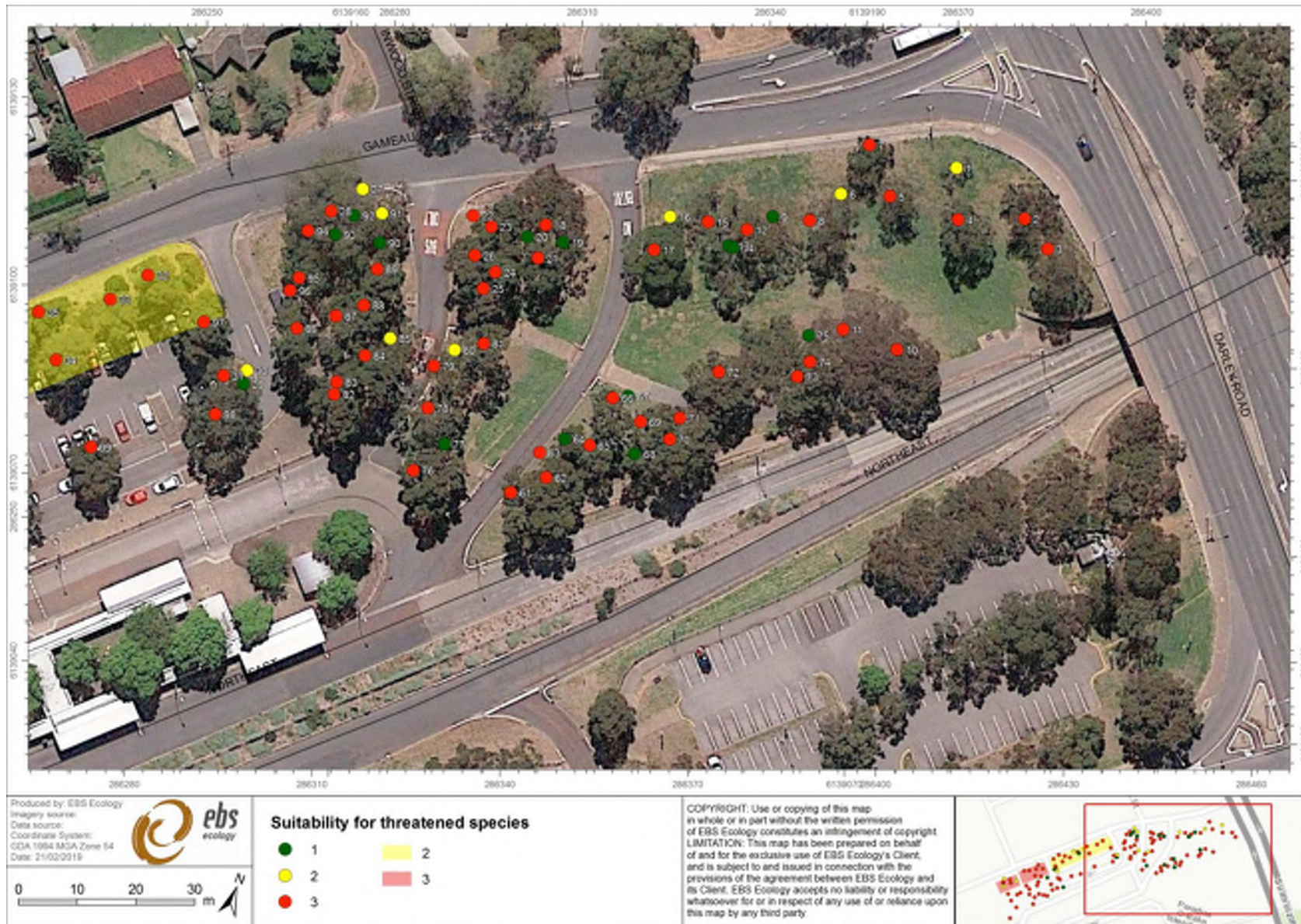


Figure 2. The suitability of individual trees (circles) and weed groups (red/yellow shaded areas) for threatened fauna species over the Project area (Map 1 of 2).



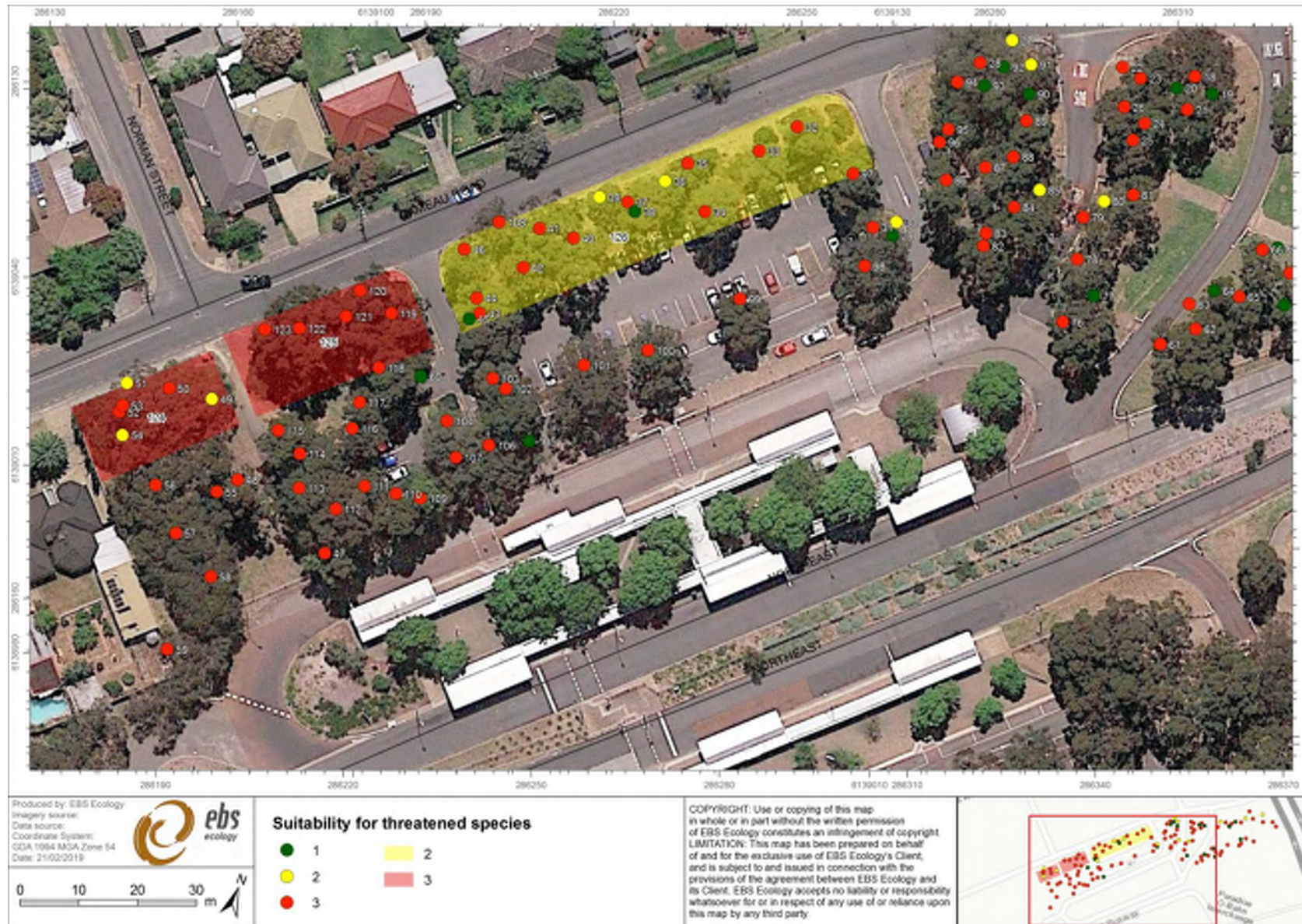


Figure 3. The suitability of individual trees (circles) and weed groups (red/yellow shaded areas) for threatened fauna species (Map 2 of 2).

## 4 DISCUSSION

A total of 94 of the 126 (74.6 %) surveyed trees and weed groups scored a maximum threatened species score of 3, meaning that at least two uncommon/ near-threatened or one rare species (at regional, state or national level) could utilize these trees. Despite this, the habitat value of individual trees with a score of 3 for threatened and uncommon fauna are not equitable. For example, a species of *Eucalyptus* or *Corymbia* (see Arborman Tree Solutions 2019 for details) with a canopy spread greater than 5 m scored the same as a large Regulated or Significant tree, whilst the latter often had substantially greater canopy cover (>10 m). As such, the Significant and Regulated trees (as assessed by an arborist under the current *Development Regulations 2008*) recorded within Project area are the most valuable to fauna species and should therefore be the focus for the retention of any trees within the Project design.

### 4.1 Important trees

The most important tree species to threatened fauna within the Project area were *Eucalyptus* and *Corymbia* species, as they provided resting and foraging strata. There were four *Eucalyptus* and two *Corymbia* species recorded within the Project area: *E. leucoxylon* (South Australian Blue Gum), *E. camaldulensis* (River Red Gum), *E. campaspe* (Silver Gimlet), *E. cladocalyx* (Sugar Gum) and *C. maculata* (Spotted Gum) and *C. citriodora* (Lemon Scented Gum). Two of these species, *E. leucoxylon* and *E. camaldulensis* are indigenous to the Adelaide plains region (Nicolle 2013); however, no individuals were remnant. All other *Eucalyptus* and *Corymbia* species within the Project area are native to Australia, however, are not indigenous to the Adelaide plains region (EUCLID 2019).

A total of eight threatened and near-threatened fauna species may use *Eucalyptus* and *Corymbia* trees within the Project area (Table 2). The canopy spread and structure of trees will influence which fauna species may use each individual tree. Willie Wagtails may use small trees with lateral branches as a resting stratum in between foraging bouts for aerial insects. The larger eucalypts may provide foraging habitat for Brush-tailed Possums (see 4.2.2) and Common Ringtail Possums (Table 5), which consume the foliage and blossom of eucalypt species, as well as Grey-headed Flying Foxes, which also consume the blossom of eucalypts (see 4.2.1). The large branches of eucalypts may also provide resting strata and perches for prey surveillance for Southern Boobooks, Tawny Frogmouths and Tree Martins (Table 5). No hollows suitable for Southern Boobooks, Tawny Frogmouths or Tree Martins to nest were recorded within the Project area.

### 4.2 Threatened fauna species

Despite not observing any threatened species on site, the eight threatened fauna species identified in the desktop assessment may use the trees within the Project area (Table 2). The ecology and potential use of the trees within the Project area by the eight threatened fauna species is described below.

#### 4.2.1 Nationally threatened fauna species

##### *Grey-headed Flying Fox (Pteropus poliocephalus)*

The Grey-headed Flying Fox is federally listed as Vulnerable under the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* and State listed as Rare under the *National Parks and Wildlife*



(NPW) Act 1972. The Project area is located within the foraging range of the population that is based at Botanic Park, Adelaide, and therefore, given the presence of food trees in the Project area, the species is considered to potentially occur.

The distribution of the Grey-headed Flying Fox has contracted in the north of Australia, and expanded in the south, with the roosting colony at Botanic Park, Adelaide, first recorded in 2010. It has been hypothesised that the Grey-headed Flying Fox may be a climate change migrant, with the increase in average temperature, leading to their presence in more temperate regions (Williams *et al.* 2006). The current population estimate at Botanic Park is 10,000 individuals, however, the increasing population is not due to successful breeding but the arrival of individuals from populations on the east coast (Van Weenen Pers. Comm.). Breeding events within the colony have largely been unsuccessful, with young individuals succumbing to heat stress (Van Weenen Pers. Comm.).

Urban environments, in particularly botanic parks, are regularly utilised by Grey-headed Flying Foxes due to the diversity of non-indigenous food plants that offer suitable food resources year-round, which allows colonies to remain sedentary. For example, in the Melbourne area, there are only 13 indigenous species within the diet of the Grey-headed Flying Fox, however a further 87 species of exotic food trees have been planted along streets (Williams *et al.* 2006).

Grey-headed Flying Foxes forage over a wide area, with individuals capable of travelling 40 km between their roost and feeding sites in a night (Eby and Law 2008). Grey-headed Flying Foxes consume fleshy fruits and blossoms, and within the Botanic Park area have been observed feeding on the fruits of the Morton Bay Fig (*Ficus macrophylla*) and the blossoms of eucalypts (*Eucalyptus spp.*) (Van Weenen pers. comm). A total of six potential food tree species from the genera *Eucalyptus* and *Corymbia* were present within the Project area, which included the River Red Gum (*Eucalyptus camaldulensis*), a known food plant species (Eby and Law 2008).

The proposed clearance of trees may result in a minor reduction in trees that could be utilised for foraging. Any removal of food trees will be negligible given the abundance of food resources within their foraging range, which has resulted in a population that is not at present food limited.

#### **4.2.2 State threatened fauna species**

##### ***Common Brushtail Possum (Trichosurus vulpecula)***

The Common Brushtail Possum is distribution over eastern Australia, including Tasmania; northern Australia; south-western Western Australia and some areas within the arid central Australia (Strahan 1995). The species is most common within metropolitan areas, however, is rare within arid central Australia (Strahan 1995). In South Australia, the species is listed as Rare under the NPW Act due its rarity in semi-arid and arid environments.

The Project area may provide habitat for the Common Brushtail Possum due its use of metropolitan habitats matched with recent local records (within 5 km) and presence of suitable food plants, the Common Brushtail Possum was considered to potentially occur within the Project area.

The diet of Common Brushtail Possums varies includes leaves, flowers and fruits (Strahan 1995). The leaves, flowers and fruits that Common Brushtail Possums feed upon are predominantly from the

*Eucalyptus* and *Corymbia* genera (Jones *et al.* 1994; Marsh *et al.* 2003). Ninety-two (92) trees within the Project area were determined to be suitable for foraging by Common Brushtail Possums.

Common Brushtail Possums require a den site where they can roost during daylight hours. Natural den sites, which include a hollow dead branch, tree trunk, fallen log or rock cavity were absent from the Project area (Strahan 1995). However, may have occurred immediately adjacent to, as the species in urban areas regularly uses the area between a house ceiling and roof (Strahan 1995).

The proposed clearance of trees may result in a highly localised impact on Common Brushtail Possums due to their small home range size of approximately 2 ha in urban environments (Harper 2005), with population densities varying from 0.2 to 4 individuals per hectare (Strahan 1995). As such, given the Project area size of 1.45 ha, 0.3 to 5.8 individuals could be impacted by a reduction in foraging habitat.

#### 4.2.3 Bio-region threatened fauna species

Six fauna species threatened at the bio-region level were considered to potentially occur within the Project area. A description of their ecology and behaviour is provided in Table 5.

**Table 5. The ecology and behaviour of fauna species threatened at the bio-region level that could occur within the Project area.**

Species name	Common name	Use of the Project area
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	The Common Ringtail Possum is a common arboreal, nocturnal mammal that inhabits metropolitan Adelaide, where it can be observed within parks, gardens and street trees (Pers. Obs.). This species has adapted well to metropolitan areas, feeding upon the leaves and fruits of an array of non-indigenous tree species (Strahan 1995). However, eucalypts are their primary food resources. The leaves and flowers of eucalypts may be consumed in the Project area.
<i>Zosterops lateralis</i>	Silvereye	The Silvereye is a small passerine that inhabits metropolitan Adelaide, especially along the River Torrens and within gardens offering extensive shrub cover (ALA 2019; Birdlife Australia 2019a). Silvereyes have a diet is dominated by fruits, however, is supplemented by invertebrates and nectar (Birdlife Australia 2019a). Food plants within the Project area would include <i>Olea europaea</i> and <i>Myoporum</i> sp. within Weed Group 124 and 125 (Pers. Obs.).
<i>Ninox boobook</i>	Southern Boobook	The Southern Boobook is a common owl species that inhabits metropolitan Adelaide, especially within parks and wooded suburbs (Pizzey and Knight 2014; Pers. Obs.). This species uses prominent perches to identify and swoop down on insects and small mammal prey, especially House Mice ( <i>Mus musculus</i> ) (Birdlife Australia 2019b). The large lateral branches of eucalypts and corymbia in the Project area would be suitable as foraging perches.
<i>Podargus strigoides</i>	Tawny Frogmouth	The Tawny Frogmouth is a predatory nocturnal bird that inhabits metropolitan Adelaide, along the River Torrens and within suburbs near (<1 km) large patches of remnant vegetation (ALA 2019). The species will pounce to the ground from an elevated perch to feed upon a wide diet comprised of small mammals, reptiles and invertebrates (Birdlife Australia 2019c). As such, the large lateral branches of eucalypts and corymbia in the Project area would be suitable as foraging perches.
<i>Petrochelidon nigricans</i>	Tree Martin	The Tree Martin is an aerial insectivore that inhabits metropolitan Adelaide, especially near parks, rivers and wooded suburbs (Pizzey and Knight 2014; Pers.

Species name	Common name	Use of the Project area
		Obs.). This species often uses the lateral branches of eucalypts for resting following aerial foraging bouts (Pers. Obs.). The large lateral branches of eucalypts and corymbia in the Project area would be suitable as roosting perches.
<i>Rhipidura leucophrys</i>	Willie Wagtail	The Willie Wagtail is a flycatcher that inhabits metropolitan Adelaide, especially within parks and gardens, where both shrub cover and open expanses are present (Pizzey and Knight 2014; ALA 2019; Pers. Obs.). The species uses low lateral branches to conduct aerial foraging bouts to catch airborne insects and pounces to the ground to feed upon other ground dwelling invertebrates (Pers. Obs.). The low lateral branches of eucalypts and corymbia would provide suitable foraging perches for Willie Wagtails, while the Weed Groups would provide suitable habitat for the species.



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## 6 APPENDIX

### Appendix 1. Threatened fauna recorded within 5 km of the Project area (NatureMaps 2019).

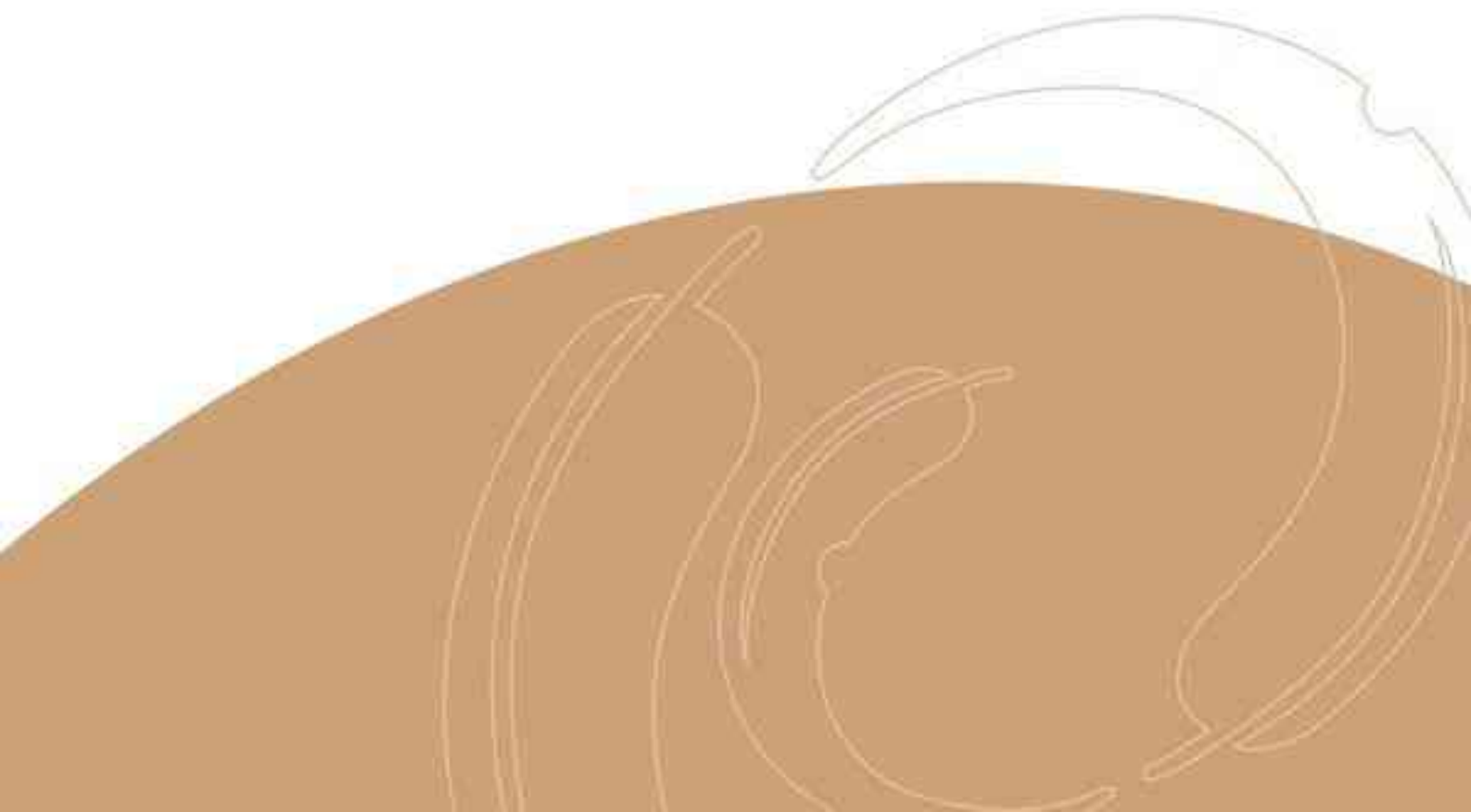
Common name	Species name	Aus	SA	Bio-region (AMLR)	Most recent record
Australasian Bittern	<i>Botaurus poiciloptilus</i>	EN	V	CR	1991
Australasian Darter	<i>Anhinga novaehollandiae</i>		R	VU	2009
Australian Crake (Australian Spotted Crake)	<i>Porzana fluminea</i>			RA	2003
Australian Pelican	<i>Pelecanus conspicillatus</i>			RA	2010
Australian Pipit	<i>Anthus australis</i>			RA	1994
Baillon's Crake	<i>Porzana pusilla</i>			VU	1994
Banded Lapwing	<i>Vanellus tricolor</i>			EN	1986
Black Swan	<i>Cygnus atratus</i>			RA	2012
Black-chinned Honeyeater	<i>Melithreptus gularis</i>		V	CR	1997
Black-fronted Dotterel	<i>Elsemyornis melanops</i>			RA	1993
Blue-billed Duck	<i>Oxyura australis</i>		R	VU	1991
Brown Songlark	<i>Megalurus cruralis</i>			RA	1975
Brown Toadlet	<i>Pseudophryne bibronii</i>		R	VU	1998
Brown Tree Frog	<i>Litoria ewingii</i>			RA	2005
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>			NT	1994
Brush Bronzewing	<i>Phaps elegans</i>			RA	1984
Budgerigar	<i>Melopsittacus undulatus</i>			RA	1990
Buff-banded Rail	<i>Gallirallus philippensis mellori</i>			RA	2012
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>			NT	1984
Caspian Tern	<i>Hydroprogne caspia</i>			VU	1989
Cockatiel	<i>Nymphicus hollandicus</i>			RA	2011
Common Brushtail Possum	<i>Trichosurus vulpecula</i>		R	RA	2005
Cunningham's Skink	<i>Egernia cunninghami</i>		E	VU	1995
Dusky Woodswallow	<i>Artamus cyanopterus</i>			RA	2010
Eastern Cattle Egret	<i>Bubulcus ibis coromandus</i>		R	VU	1991
Eastern Shrike-tit	<i>Falcunculus frontatus frontatus</i>		R	EN	2008
Fairy Martin	<i>Petrochelidon ariel</i>			RA	2001
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>			NT	2011
Great Cormorant	<i>Phalacrocorax carbo</i>			RA	2001
Great Crested Grebe	<i>Podiceps cristatus</i>		R	VU	1992
Great Egret	<i>Ardea alba modesta</i>			VU	2010
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	VU	R	RA	2015
Hoary-headed Grebe	<i>Poliocephalus poliocephalus</i>			NT	2005
Horsfield's Bronze Cuckoo	<i>Chalcites basalus</i>			NT	2012
Little Eagle	<i>Hieraaetus morphnoides</i>			EN	2002
Musk Duck	<i>Biziura lobata</i>		R	VU	2005
Nankeen Night Heron	<i>Nycticorax caledonicus</i>			VU	2012
Pacific Black Duck	<i>Anas superciliosa</i>			VU	2013

Common name	Species name	Aus	SA	Bio-region (AMLR)	Most recent record
Pacific Swift (Fork-tailed Swift)	<i>Apus pacificus</i>			RA	1999
Pallid Cuckoo	<i>Cacomantis pallidus</i>			RA	1982
Peaceful Dove	<i>Geopelia placida</i>			VU	2003
Purple-crowned Lorikeet	<i>Parvipsitta porphyrocephala</i>			NT	2011
Rainbow Bee-eater	<i>Merops ornatus</i>			VU	1984
Red-browed Finch	<i>Neochmia temporalis</i>			NT	2013
Restless Flycatcher	<i>Myiagra inquieta</i>		R	CR	1985
Royal Spoonbill	<i>Platalea regia</i>			VU	1995
Rufous Songlark	<i>Megalurus mathewsi</i>			VU	1991
Sacred Kingfisher	<i>Todiramphus sanctus</i>			NT	2013
Scarlet Robin (SE, MLR, FR, EP)	<i>Petroica boodang boodang</i>		R	VU	1989
Silvereye	<i>Zosterops lateralis</i>			VU	2013
Southern Boobook	<i>Ninox boobook</i>			NT	2007
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>			RA	1985
Spotted Pardalote	<i>Pardalotus punctatus</i>			NT	2012
Straw-necked Ibis	<i>Threskiornis spinicollis</i>			NT	1986
Stubble Quail	<i>Coturnix pectoralis</i>			NT	1993
Tawny Frogmouth	<i>Podargus strigoides</i>			NT	2001
Tawny-crowned Honeyeater	<i>Gliciphila melanops</i>			EN	1984
Tree Martin	<i>Petrochelidon nigricans</i>			NT	2012
Varied Sittella	<i>Daphoenositta chrysoptera</i>			VU	1984
Whiskered Tern	<i>Chlidonias hybrida</i>			VU	1984
Whistling Kite	<i>Haliastur sphenurus</i>			EN	2017
White-browed Babbler	<i>Pomatostomus superciliosus</i>			EN	1984
White-headed Stilt	<i>Himantopus leucocephalus</i>			VU	1985
White-naped Honeyeater	<i>Melithreptus lunatus</i>			VU	2005
White-necked Heron	<i>Ardea pacifica</i>			VU	1985
White-throated Gerygone	<i>Gerygone olivacea</i>		R	RA	1984
White-throated Needletail	<i>Hirundapus caudacutus</i>			CR	1985
White-winged Triller	<i>Lalage tricolor</i>			RA	1984
Willie Wagtail	<i>Rhipidura leucophrys</i>			NT	2013
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>			NT	1999
Zebra Finch	<i>Taeniopygia guttata</i>			VU	2000





*EBS Ecology*  
125 Hayward Avenue  
Torrensville, SA 5031  
[www.ebsecology.com.au](http://www.ebsecology.com.au)  
t. 08 7127 5607



## **Attachment 13: Cycle Storage Imagery**



Example of existing cycle storage (cycle boxes and cycle hoops) at south western corner of the existing carpark



Existing 16 cycle capacity storage cage at the eastern end of the interchange platform.





**PUBLIC TRANSPORT PROJECTS ALLIANCE  
PARADISE PARK'N'RIDE**

# **PLANNING REPORT Addendum**

## **Application for Roadwork and Tree Damaging Activities (including removal)**

**Doc No:** PTPA-APNR-110000-REP-0000-PLN-0001  
**Client:** The Department of Planning, Transport and Infrastructure (DPTI)  
**Program:** Public Transport Projects Alliance – PARADISE PARK'N'RIDE  
**Location:** Paradise O-Bahn Interchange Park'n'Ride, Paradise, 5075, South Australia  
**Project No:**  
**Revision:** A  
**Date:** 18 July 2019

### **Revision History**

<b>Rev</b>	<b>Date</b>	<b>Description</b>	<b>Prepared by</b>	<b>Reviewed by</b>	<b>Endorsed by</b>
A	18 July 2019	Issued to SCAP	Amber Smith	Brett Pendlebury	Adam Kilsby

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## Addendum item #1

Addition to Section 7.7 'Headlight nuisance'.

### 7.7.2 Operational impacts and mitigation

Upon completion, all passenger vehicles departing the western carpark upper deck will do so from the ramp at the south west corner of the carpark.

Passenger vehicle headlight nuisance to the residential property immediately to the west of the western carpark egress (exit) from the single deck structure has been minimised by placing the ramp in proximity to the shed and rear yard and not the dwelling / residence (Refer Figure 1 below).

In addition to structural design and ramp location, light from headlights will be screened by:

- Vegetation (both retained and planted) along the boundary;
- The existing, 1.8m-high, fence; and
- The existing garage (>2.2m high).

To address vehicle headlight nuisance to the west of the single deck carpark whilst vehicles access carparks, the second layer of metal cladding (the same material as the exterior cladding) will be fixed to the internal structure, offset to the external cladding on the western end (Refer to Figure 2). This will be in addition to the solid w-beam vehicle stop barrier that will also offer additional blocking of vehicle headlights outside the structure.



**Figure 1.** Ramp location and vegetation buffer. **Figure 2.** Western end cladding on single deck.

## Addendum item #2

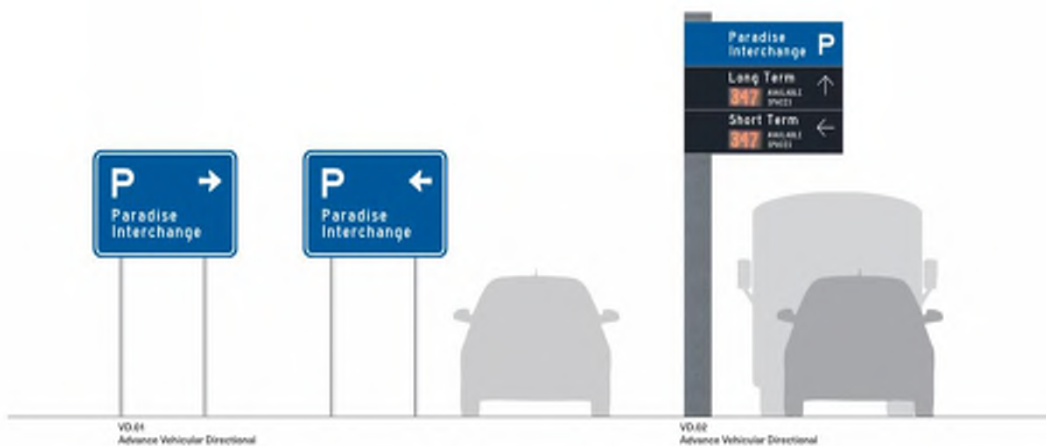
Addition to Section 6.2 'Project components.

### 6.2.1 Operational impacts and mitigation

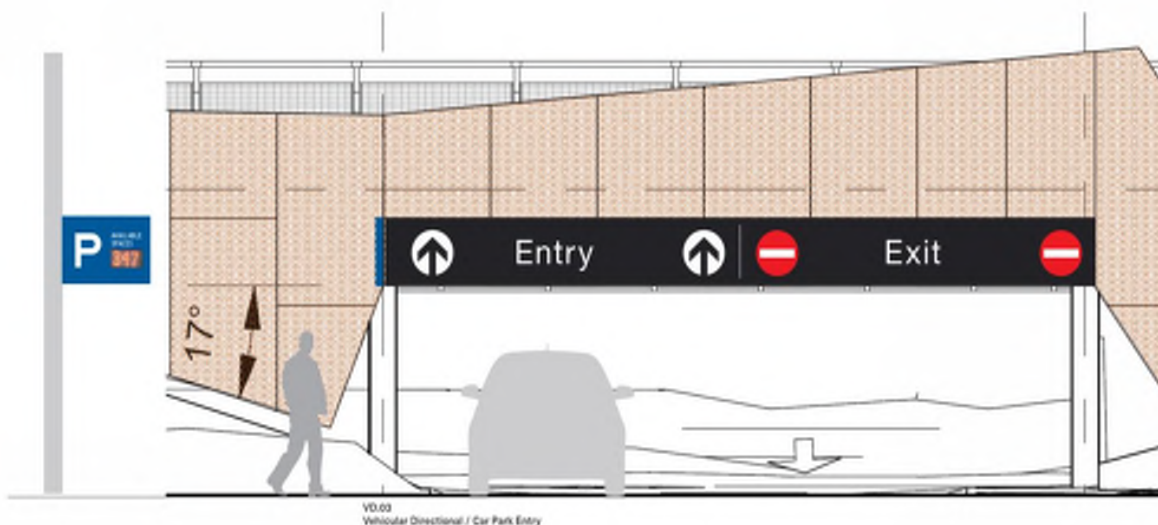
As part of the design for the Paradise Park'n'Ride there are designated "kiss and drop" parking spaces as indicated in the architectural drawing in Figure 5 on the following page. Twelve (12) "kiss and drop" spaces are located on the southern side of the at-grade level of the western carpark. The parking spaces will be open to longer term parking outside of designated "kiss and drop" time zones.

The signage to indicate the "kiss and drop" zones will be both painted on the ground surface in the centre at the rear of each parking space and clearly signposted immediately adjacent to each group of "kiss and drop" parking spaces.

In addition, there will be digital carpark counter signage that will be provided in two locations at the site to show the available carpark numbers. One will be located at the open at grade carpark on Gameau Road, the second electronic car park counter will be located on the western façade of the single deck carpark. Refer to Figure 3 and 4 below for an example of these electronic carpark displays.



**Figure 3.** Architectural layout of the western end, at-grade carpark with allocated "kiss and drop" zones and DDA compliant spaces.



**Figure 4.** Electronic carpark sensor signage to indicate available parks.





**Figure 5.** Detailed architectural layout of the western end, at-grade carpark with 'kiss and drop' zones and DDA compliant parking spaces.

## Addendum item #3

Addition to Section 8.3 'General Section'.

### 8.3.9 Regulated Trees

The reference to Schedule 14(4)(b)(vii)(B) on Page 82 of the Planning Report (as tree-damaging activities to Regulated Trees) is incorrect – this should be Schedule 14(1)(1)(v)(ii)(B) as referred to on Page 75 of the Planning Report.

## Addendum item #4

Addition to Section 7.1 'Pedestrian and cycling movement'.

### 7.1.1 Existing conditions

Page 52 (the last sentence) of the submission refers to *'the more direct access to the Torrens Linear Trail across the signalised intersection / Darley Road to the east'*.

This sentence should have read *'the more direct access to the Torrens Linear Trail across the signalised intersection with pedestrian crossing at Darley Road to the east'*, as illustrated by the red lines illustrating pedestrian movement in Figure 6 below.



**Figure 6.** An aerial image showing the pedestrian links to and across the Torrens Linear Trail.





## LEGEND



Proposed footpath pram ramp



Proposed segment paving



Proposed in-situ concrete paving



Proposed asphalt paving - pedestrian grade



Proposed asphalt paving - vehicle grade



Existing tree to be retained



Proposed tree



Proposed garden bed



Proposed retaining wall



Realigned/ Proposed pedestrain barrier

## KEY

01

Proposed single storey car park

02

Proposed upper level single storey car park

03

Proposed at grade car park

04

Realigned bus access/ exit

05

4m Landscape buffer to adjacent residential property

06

Planted slope as green buffer to neighbourhood

07

Relocated existing seat

08

Expanded existing bike storage shed

09

Proposed node with bike racks and seats



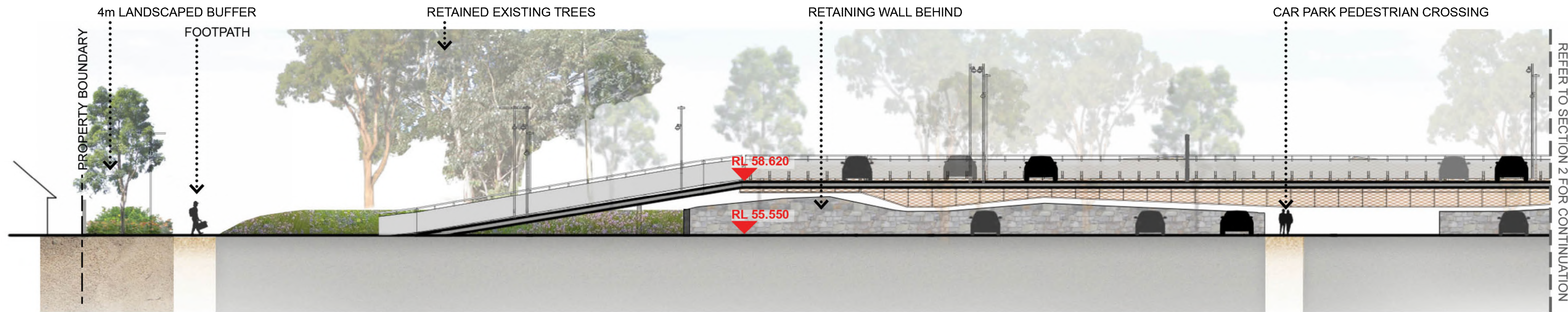
Paradise Park 'N' Ride - Eastern End



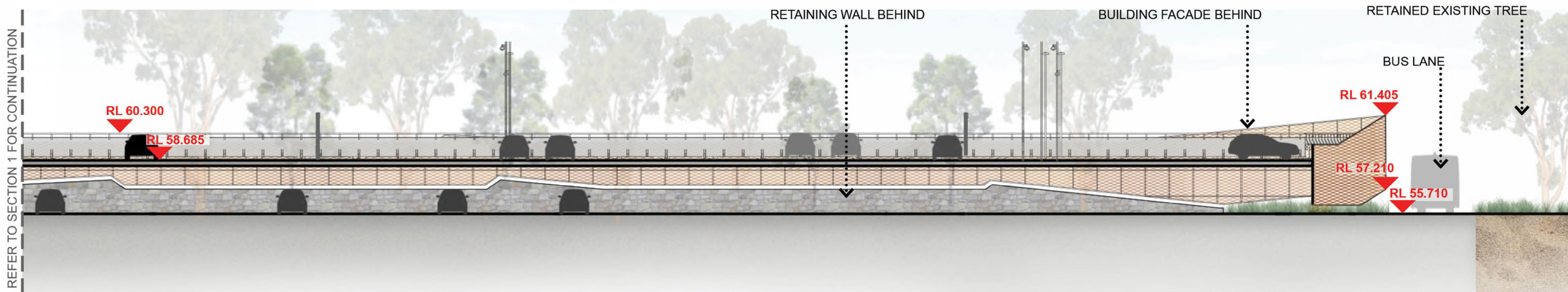
Paradise Park 'N' Ride - Western End



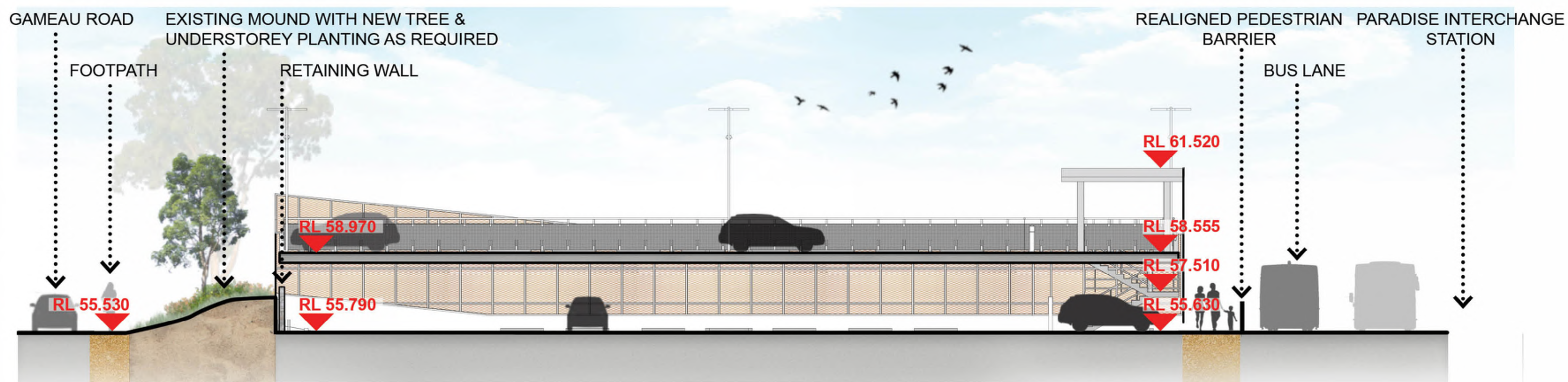




SECTION 1 A-A



SECTION 2 A-A

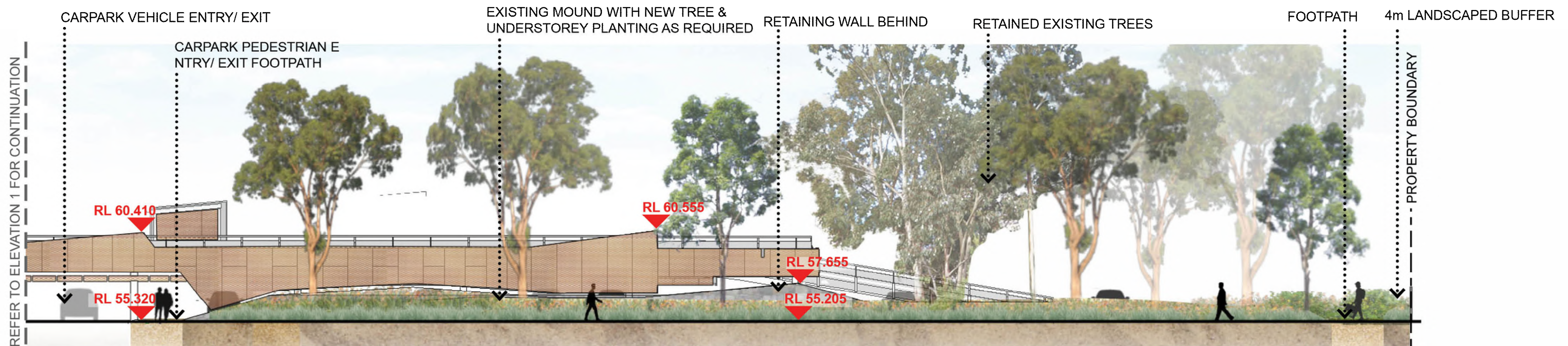


SECTION 3 B-B





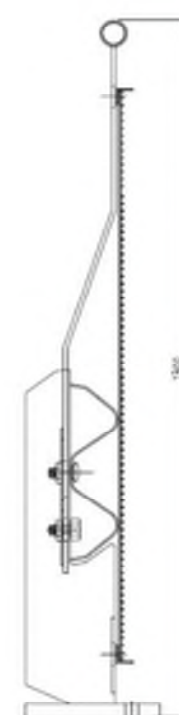
**ELEVATION 1 C**



**ELEVATION 2 C**



**CAR PARK FACADE CLADDING**



**RHINO-STOP TYPE 6**

