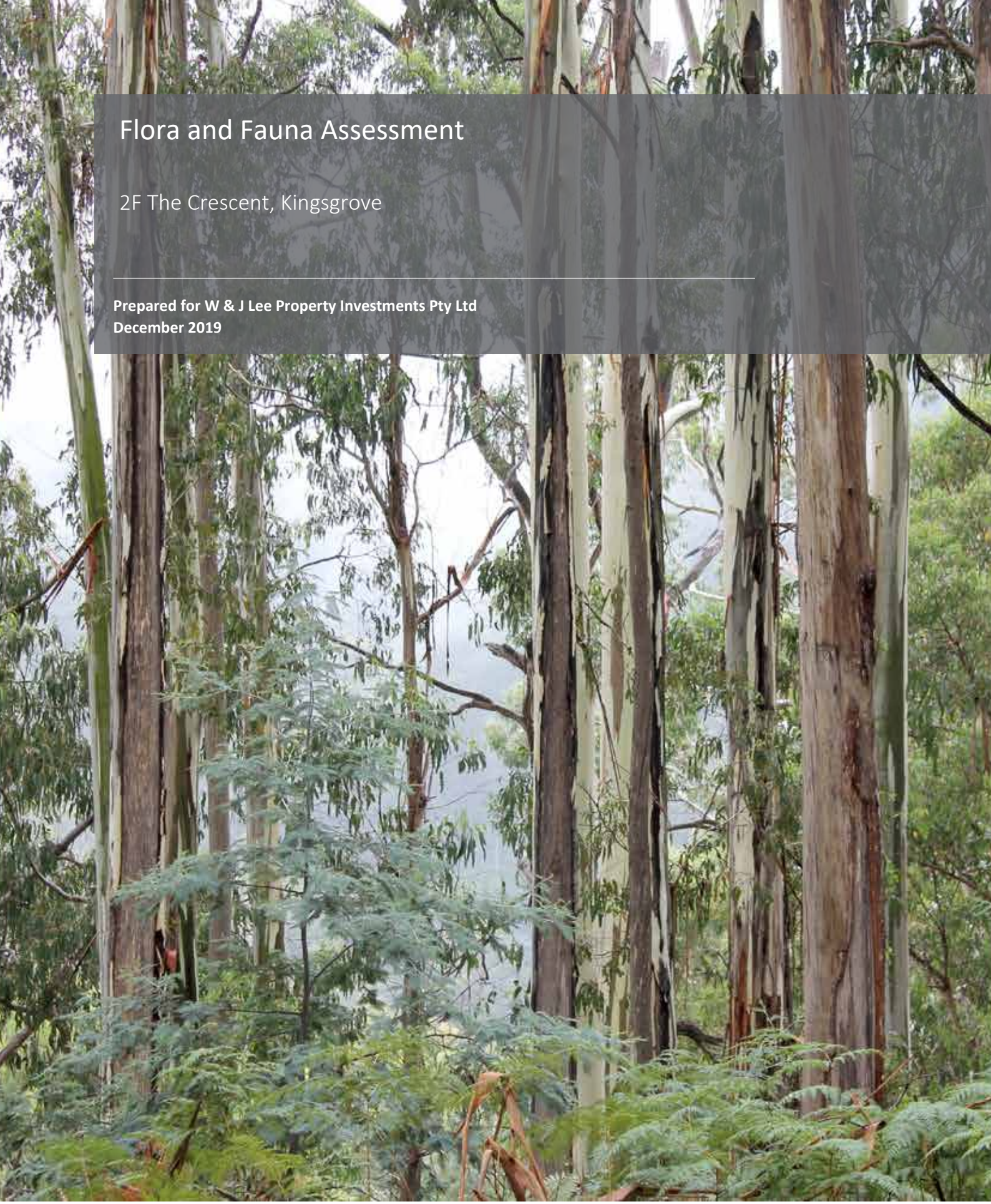
Flora and Fauna Assessment

2F The Crescent, Kingsgrove

Prepared for W & J Lee Property Investments Pty Ltd
December 2019



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Flora and Fauna Assessment

2F The Crescent, Kingsgrove

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Client

W & J Lee Property Investments Pty Ltd

Date

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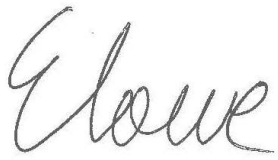

Erin Lowe
Senior Ecologist
20 December 2019

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This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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1 Introduction

1.1 Project background and development proposal

W & J Lee Property Investments Pty Ltd proposes to construct and operate a resource recovery facility (the facility) at 2F The Crescent, Kingsgrove (the site), within the Georges River local government area (LGA) (Figure 1.1).

The facility will receive, sort and process up to 35,000 tonnes per annum (tpa) of dry, general solid waste (non-putrescible) and recyclable materials with incoming material primarily sourced from the construction and demolition, commercial, industrial and residential sectors. It is not proposed to use the site for long term storage of any waste or recyclable material. Processed materials will be dispatched directly to customers/retailers for re-use or to other specialist waste facilities for further processing to achieve marketable recycled products.

No asbestos, liquid waste, hazardous waste or radioactive waste, as defined in the NSW *Protection of the Environment Operations Act 1979* (POEO Act) and the *Waste Classification Guidelines* (EPA 2014) will be accepted at the facility. All of the materials brought onto the site would be taken from the site as products or as rejects for disposal at a NSW Environment Protection Authority (EPA) licensed landfill. Odorous materials will not be received and there will be no materials land-filled or otherwise disposed anywhere within the site as a result of this proposal.

EMM Consulting Pty Limited (EMM) was commissioned by W & J Lee Property Investments Pty Ltd to prepare a flora and fauna assessment (this report) to assess the ecological impacts of the construction and operation of the facility (the project).

1.2 Site description

The site is located at 2F The Crescent, Kingsgrove and is legally described as Lot 2 DP 1237586, as identified in Figure 1.2. The site is located in Georges River LGA and measures approximately 4,638 metres squared (m^2), or 0.46 hectares (ha). The site had previously been two separate lots until recently amalgamated. As a result, there have been updates to legal description of the lot and the site. A line of trees and wire fence still distinguish the previous 'funnel shaped' lot to the east from the more regular shaped lot to the west. The site is bordered by a stormwater drainage reserve on the northern fence line and is neighboured by two other industrial operations to the east and west (Figure 1.2). The site is accessed via The Crescent and is level (approximately 20 m Australian Height Datum (AHD)), with a slight fall away from The Crescent towards the stormwater drainage at the rear. The three entrances to the site are paved concrete and the remainder of the site is predominantly gravel. The site is zoned IN2 Light Industrial pursuant to Hurstville Local Environmental Plan 2012 (HLEP).

1.3 Purpose of this report

This flora and fauna assessment forms part of the development application (DA) and accompanies the Environmental Impact Statement (EIS) for the project, which will be assessed and determined under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) by Georges River Council. The development is both designated and integrated development under EP&A Act, POEO Act and the *Water Management Act 2000*.

This flora and fauna assessment was undertaken by EMM to consider the impacts of the project, specifically to:

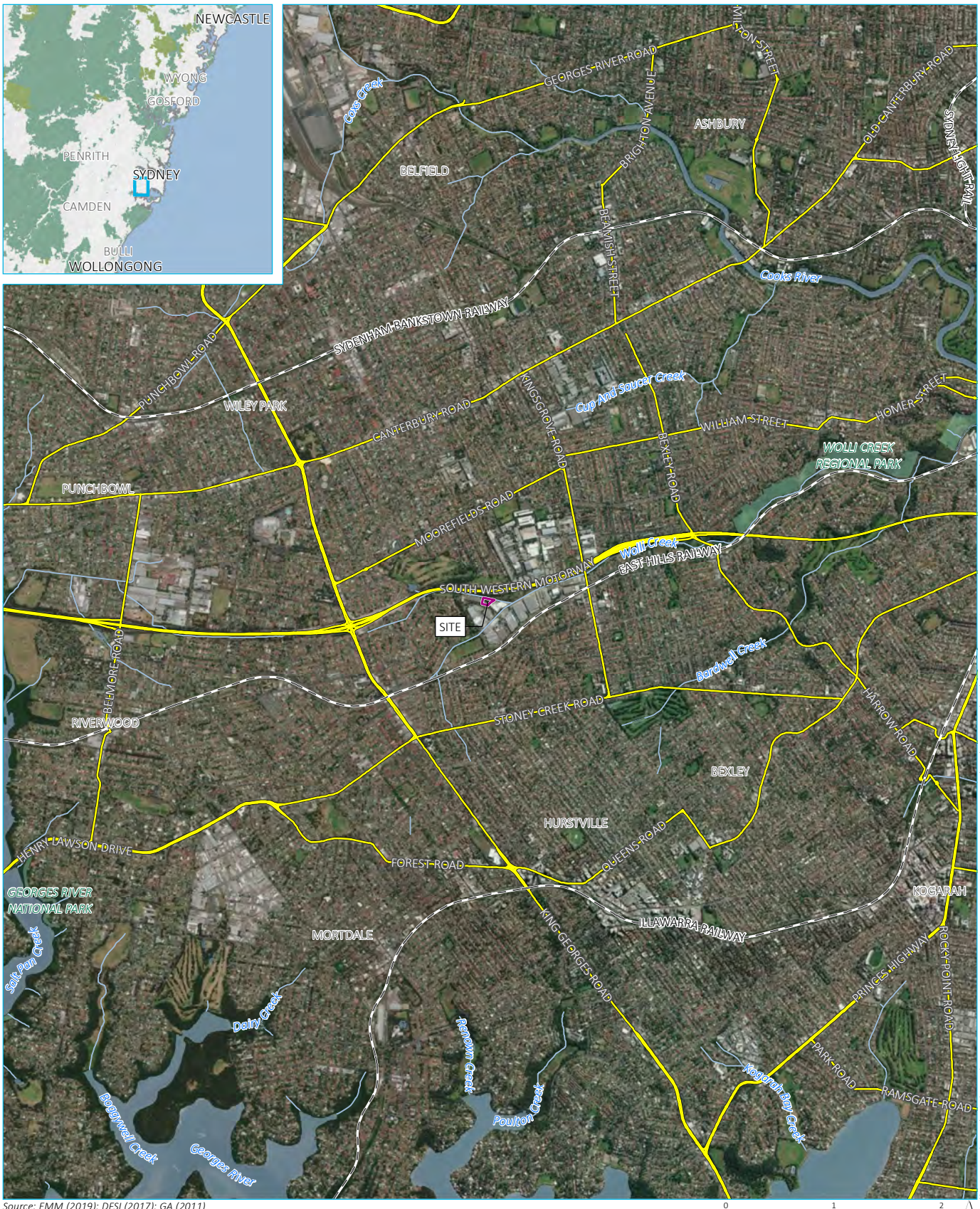
- assess the characteristics and ecological condition of the vegetation communities and habitat within the site;
- determine occurrence, or likelihood of occurrence, of threatened species, populations and threatened ecological communities (TECs) listed under the *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);

- describe and quantify impacts on biodiversity resulting from the project; and
- provide recommendations to avoid, minimise and mitigate potential impacts of the project on biodiversity.

1.4 Legislative context

The project has been assessed against key biodiversity legislation and government policy, including:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *NSW Environmental Planning and Assessment Act 1979* (EP&A Act);
- *NSW Biodiversity Conservation Act 2017* (BC Act);
- *NSW Biodiversity Conservation Regulation 2017* (BC Regulation); and
- *NSW Biosecurity Act 2015* (Biosecurity Act).



Source: EMM (2019); DFSI (2017); GA (2011)

0 1 2 km

GDA 1994 MGA Zone 56

N

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KEY

- Site boundary
- Rail line
- Main road
- Watercourse/drainage line
- Waterbody
- NPWS reserve

Project location

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Flora and fauna assessment
Resource recovery facility
2F The Crescent, Kingsgrove
Figure 1.1

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KEY

- Site boundary
- Cadastral boundary

Strahler stream order

- 2nd order

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Source: EMM (2019); DFSI (2019); GA (2011); NearMap (2019)

0 10 20 m

GDA 1994 MGA Zone 56

N

The site

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Figure 1.2

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2 Legislative context

This chapter provides a brief outline of the key biodiversity legislation and government policy considered in this assessment.

2.1 Commonwealth

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places and water resources which are defined as Matters of National Environmental Significance (MNES) under the EPBC Act. These are:

- world heritage properties;
- places listed on the National Heritage Register;
- Ramsar wetlands of international significance;
- threatened flora and fauna species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- water resources, in relation to coal seam gas or large coal mining development.

Under the EPBC Act, an action that may have a significant impact on a MNES is deemed to be a 'controlled action' and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that may potentially have a significant impact on a MNES is to be referred to DoEE for determination as to whether or not it is a controlled action. If deemed a controlled action, the project is assessed under the EPBC Act for approval.

The project is unlikely to have a significant impact on MNES and is, therefore, not required to be referred to DoEE for approval. Further information is provided in Section 6.1 of this report.

2.2 State

2.2.1 Biodiversity Conservation Act 2016

The BC Act is the key piece of legislation responsible for the conservation of biodiversity in NSW through the protection of threatened flora and fauna species, populations and ecological communities. The BC Act, together with the BC Regulation, establishes the Biodiversity Offsets Scheme (BOS), the Biodiversity Assessment Method (the BAM) and a method for determining whether development is considered likely to significantly affect threatened species, ecological communities or their habitats. The application of the BOS is required for any projects exceeding certain thresholds outlined in the BC Regulation. The thresholds are:

- the proposed development exceeds the BOS area threshold, as set out in clause 7.2 of the BC Regulation;

- the proposed development will clear native vegetation on land included on the Biodiversity Values Map; and
- for proposals that do not trigger the above thresholds, whether the proposed action will have a significant impact upon threatened species or TECs (the 'five-part test').

For State Significant Development (SSD) and State Significant Infrastructure (SSI) under the EP&A Act, the BOS and BAM is required for projects that will impact on biodiversity values, unless a waiver is granted. The project is not classified as SSD or SSI, therefore the BOS does not apply.

Further, the project does not trigger the thresholds outlined in the BC Regulation and is therefore not required to be assessed under the BOS. Further details are provided in Section 6.2 of this report.

2.2.2 Biosecurity Act 2015

The primary objective of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

The Biosecurity Act stipulates management arrangements for weed biosecurity risks in NSW, with the aim to prevent, eliminate and minimise risks. Management arrangements include:

- any land managers and users of land have a responsibility for managing weed biosecurity risks that they know about or could reasonably be expected to know about;
- applies to all land within NSW and all waters within the limits of the state; and
- local strategic weed management plans will provide guidance on the outcomes expected to discharge duty for the weeds in that plan.

The Biosecurity Regulation 2017 (BS Regulation) sets out mandatory measures to prevent, eliminate or minimise a biosecurity risk posed or likely to be posed by biosecurity matter.

The *Greater Sydney Regional Strategic Weed Management Plan* (GSLLS 2017) outlines how government, industry, and the community will share responsibility and work together to identify, minimise, respond to and manage weeds. The plan also supports regional implementation of the Biosecurity Act and BS Regulation.

Further consideration of weeds within the site and in relation to the Biosecurity legislation is given in Sections 4.2 and 6.3 of this report.

3 Methods

3.1 Desktop assessment

A desktop assessment was undertaken to provide context for the site and to determine the presence of any TECs, populations or species listed under the BC Act or EPBC Act. Information was obtained from the following sources:

- Commonwealth Department of Environment and Energy (DoEE) *Protected Matters Search Tool* (PMST) for Matters of National Environmental Significance (MNES) (DoEE, 2019a) (1 km buffer of the site);
- NSW Department of Planning, Industry and Environment (DPIE) *Biodiversity Values Map and Threshold Tool* (BMAT) (DPIE 2019a);
- DPIE *BioNet Atlas of NSW Wildlife* (BioNet) (DPIE 2019b) to access:
  - threatened species profiles; and
  - BioNet Atlas data (10 km buffer of the site);
- the NSW Plant Community Types (PCTs), as held within the *Vegetation Information System (VIS) Classification 2.1 database*;
- State Vegetation Type Mapping, *SydneyMetroArea_v3_2016_E_4489* (OEH 2017a);
- *2F The Crescent, Kingsgrove - Arboricultural Impact Assessment* (Tree Survey 2019); and
- aerial imagery for interpretation of the study area and locality (defined as within 10 km).

3.2 Site inspection

A site inspection was undertaken by an EMM Ecologist on 7 March 2019, consisting of vegetation assessment, fauna habitat assessment and threatened species habitat assessment as described in the following sections.

3.2.1 Vegetation assessment

EMM surveyed the tree species on site, in order to inform any conclusions on PCTs present, particularly that representative of TECs. Notes were taken describing any disturbances (such as weed invasion and human disturbance) to assess the vegetation condition. Due to its small size and condition (consisting of gravel hardstand with trees around the site boundary), the entire site was able to be traversed and observed.

All trees within the site and surrounds have also been mapped by Tree Survey (2019) as part of an Arboricultural Impact Assessment (AIA) for the project.

3.2.2 Fauna habitat assessment

Concurrent with the vegetation assessment, a habitat assessment was undertaken seeking to identify the following fauna habitat features within the study area:

- habitat trees including large hollow-bearing trees;
- availability of flowering shrubs and feed tree species;

- quantity of ground litter and logs; and
- searches for indirect evidence of fauna, such as scats.

No targeted fauna surveys were required as no suitable habitat for threatened fauna species was identified.

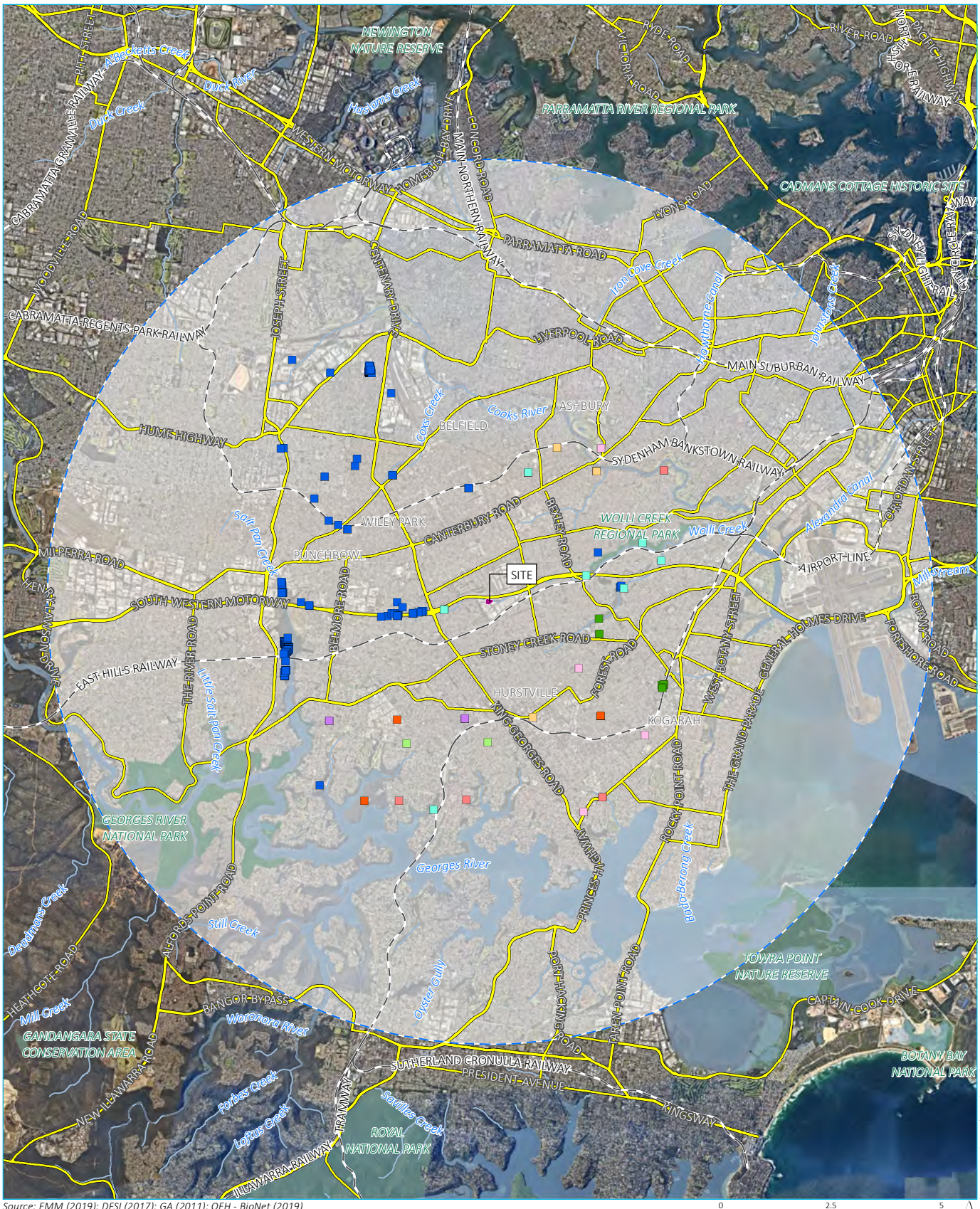
4 Results

4.1 Desktop assessment

A total of 48 State and/or Commonwealth listed species were identified in the BioNet (10 km radius) and PMST (1 km radius) searches, including:

- 20 plant species;
- three amphibian species;
- 16 bird species;
- eight mammal species; and
- one reptile species.

Figure 4.1 shows the location of the BioNet records in the locality and the likelihood of the species occurring within the site is discussed within Section 4.5.



Source: EMM (2019); DFSI (2017); GA (2011); OEH - BioNet (2019)

0 2.5 5 km

GDA 1994 MGA Zone 56

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KEY

- Site boundary
- Site boundary 10 km buffer
- Rail line
- Main road
- Watercourse/drainage line
- Waterbody
- NPWS reserve

Threatened flora species

(1)	*Epacris purpurascens* var. *purpurascens*	
(2)	*Maundia triglochinoides*	
(14)	Black-eyed Susan (*Tetratheca juncea*)	
(4)	Bynoe's Wattle (*Acacia bynoeana*)	
(6)	Deane's Paperbark (*Melaleuca deanei*)	
(680)	Downy Wattle (*Acacia pubescens*)	
(3)	Hairy Geebung (*Persoonia hirsuta*)	
(8)	Magenta Lilly Pilly (*Syzygium paniculatum*)	
(3)	Narrow-leafed Wilsonia (*Wilsonia backhousei*)	
(4)	Scrub Turpentine (*Rhodamnia rubescens*)	
(7)	Sunshine Wattle (*Acacia terminalis* subsp. *terminalis*)	
(2)	Thick Lip Spider Orchid (*Caladenia tessellata*)	

Threatened flora species records within the locality

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Figure 4.1

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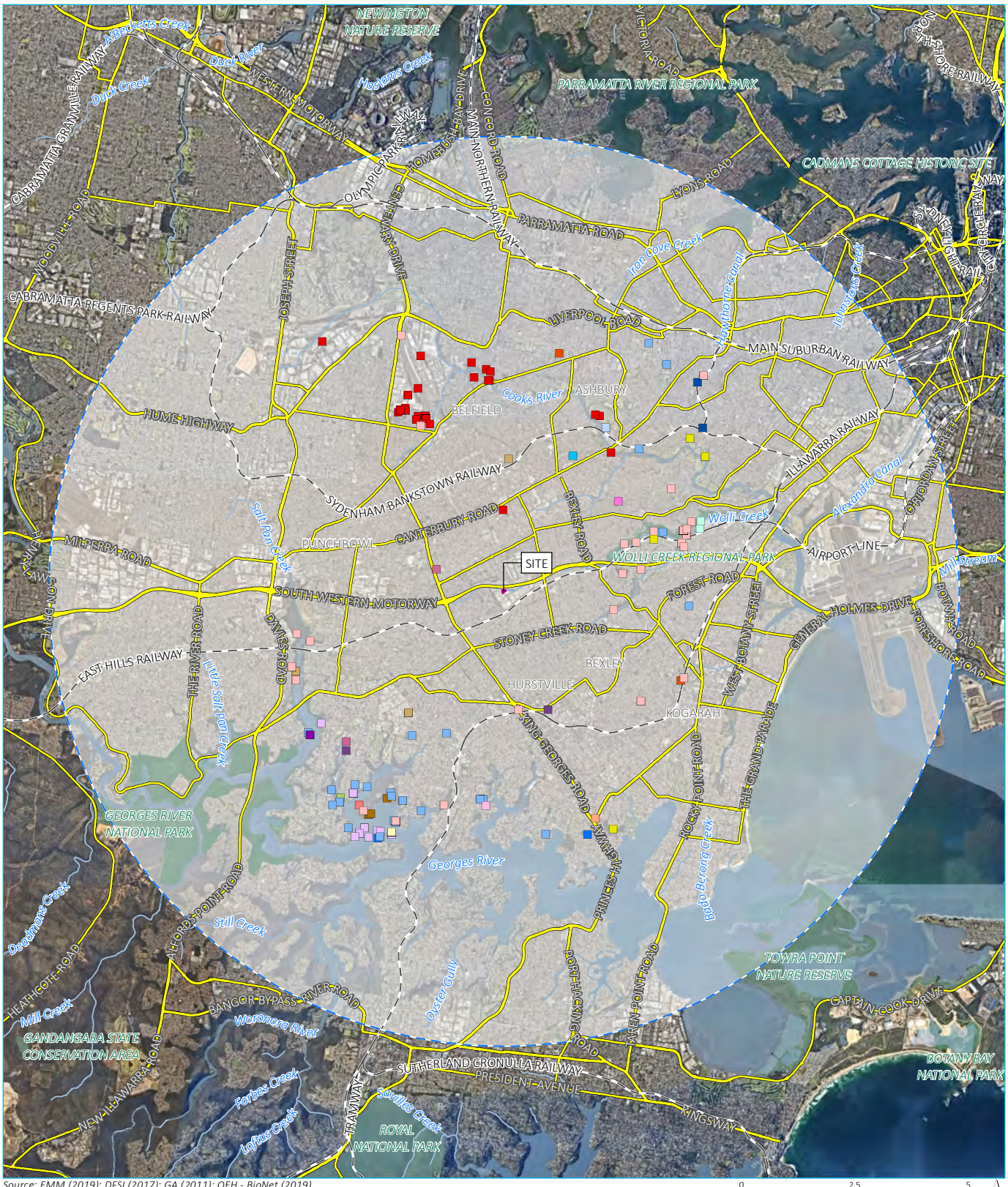

Source: EMM (2019); DFSI (2017); GA (2011); OEH - BioNet (2019)

0 2.5 5 km

GDA 1994 MGA Zone 56

N

KEY

- Site boundary
- Site boundary 10 km buffer
- Rail line
- Main road
- Watercourse/drainage line
- Waterbody
- NPWS reserve

Threatened fauna species

- (1) Black-necked Stork (*Ephippiorhynchus asiaticus*)
- (2) Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)
- (4) Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)
- (6) Eastern Curlew (*Numenius madagascariensis*)
- (1) Eastern Freetail-bat (*Mormopterus norfolkensis*)
- (13) Eastern Osprey (*Pandion cristatus*)
- (2) Flame Robin (*Petroica phoenicea*)
- (2) Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- (62) Green and Golden Bell Frog (*Litoria aurea*)
- (71) Grey-headed Flying-fox (*Pteropus poliocephalus*)
- (1) Koala (*Phascolarctos cinereus*)
- (1) Little Eagle (*Hieraaetus morphnoides*)
- (3) Long-nosed Bandicoot population in inner western Sydney (*Perameles nasuta*)
- (2) Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)
- (1) Masked Owl (*Tyto novaehollandiae*)
- (2) Pied Oystercatcher (*Haematopus longirostris*)
- (31) Powerful Owl (*Ninox strenua*)
- (1) Red-crowned Toadlet (*Pseudophryne australis*)
- (3) Regent Honeyeater (*Anthochaera phrygia*)
- (4) Square-tailed Kite (*Lophoictinia isura*)
- (2) Superb Fruit-Dove (*Ptilinopus superbus*)
- (3) Swift Parrot (*Lathamus discolor*)
- (1) Turquoise Parrot (*Neophema pulchella*)
- (8) White-bellied Sea-Eagle (*Haliaeetus leucogaster*)

Threatened fauna species records within the locality

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Flora and fauna assessment
Resource recovery facility
2F The Crescent, Kingsgrove
Figure 4.2

EMM creating opportunities

4.2 Vegetation

The site has been predominantly cleared with a total of 30 trees being the most significant vegetation present. The trees include 13 Swamp Oak (*Casuarina glauca)*, six Mugga Ironbark (*Eucalyptus sideroxylon*), one Grey Box (*Eucalyptus moluccana*) and one unidentified *Eucalyptus* species that occur in a line of trees that bisect the lot. Nine trees occur along the northern boundary of the site, including three Swamp Oak, three Flooded Gum (*Eucalyptus grandis),* one Sydney Blue Gum (*Eucalyptus saligna),* one Bangalay (*Eucalyptus botryoides),* one unidentified *Eucalyptus* species. Photograph 4.1 and Photograph 4.2 show the site and adjacent trees.

Photograph 4.1 The site, looking north-west from the south-eastern boundary fence

Photograph 4.2 The site, looking south-west from the south-eastern boundary fence

Eight Swamp Oak and one unidentified *Eucalyptus* species occur within the proposed impact area and will require removal. Additionally, seven trees are directly adjacent to the footprint of the proposed works, such that a major encroachment (>20%) to the Tree Protection Zone (TPZ), as defined by Tree Survey (2019), will be caused by the proposal and their removal is recommended. These include three Mugga Ironbark, three Swamp Oak and one Grey Box.

The remaining 14 trees mapped by Tree Survey (2019) occur either adjacent to or outside of the proposed works and are proposed to be retained. These include three trees (two Mugga Ironbark and one Swamp Oak) that are directly adjacent to the footprint of the proposed works, such that a major encroachment (10-20%) to the TPZ, as defined by Tree Survey (2019), will be caused by the proposal. The encroachment will not impact the Structural Root Zone (SRZ) of the three trees and is unlikely to impact the overall health and condition of the trees providing mitigation measures are implemented. The recommended mitigation measures for the trees to be retained (with major encroachment to the TPZ) is outlined in Tree Survey (2019) (Appendix C) and explained further within Sections 5 and 7 of this report. A total of three trees adjacent to the proposed works (all Swamp Oak) will be subject to minor encroachment (<10%) to the TPZ, with the encroachment not impacting the SRZ and being unlikely to impact the overall health and condition of the trees (Tree Survey 2019). A total of eight trees (comprising two Swamp Oak, three Flooded Gum, one Bangalay, one Sydney Blue Gum and one unidentified *Eucalyptus* species) are located outside of the proposed works and no impacts are foreseeable under the current proposal (Tree Survey 2019).

The trees within the site do not align neatly with any PCTs mapped within the locality and are likely the result of past landscape planting as well as some natural regeneration.

Aside from the trees within the site, the remaining vegetation within the site is dominated by exotic shrubs, groundcover and climbers, with dominant species including Small-leaved Privet (*Ligustrum sinense*), Paddy's Lucerne (*Sida rhombifolia*), Cobblers Pegs (*Bidens pilosa*) and Morning Glory (*Ipomoea indica*). These species occur on the northern boundary of the site and are associated with the vegetation community in the drainage line to the north of the site. This vegetation in the drainage line is dominated by Swamp Oak, with Cockspur Coral Tree (*Erythrina crista-galli*) also present in the overstorey. Small-leaved Privet and Morning Glory dominate the understorey in the drainage line. Beyond the drainage directly north of the site, to the east and west, there is a mosaic of Swamp Oak and other Eucalypt species. Photograph 4.3 and Photograph 4.4 show the vegetation community to the north of the site.

Photograph 4.3 Vegetation in the drainage line to the north of the site

Photograph 4.4 Vegetation in the drainage line to the north of the site

4.3 Threatened Ecological Communities

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions is an Endangered Ecological Community (EEC) listed under the BC Act. The EEC is characterised by Swamp Oak on the Coastal Floodplains of NSW, and includes disturbed examples, such as scattered trees and recolonised patches of Swamp Oak in areas that may have not previously supported the community due to changes in drainage regimes (DECC 2007).

The dominant tree species within the site and also within the drainage line to the north of the site is Swamp Oak and the site is within the known distribution of the EEC, therefore the vegetation to the north of the site, and those Swamp Oak trees that occur within the line of trees that bisect the site are considered part of the EEC. An Assessment of Significance ('the five-part test') has been undertaken to assess the significance of the impacts of the project on this EEC, and is discussed further in Section 5.

This BC Act listed EEC also corresponds with the EPBC Act listed *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland EEC.* However, the conservation advice (incorporating listing advice) for this EPBC Act listed community (DoEE 2018) sets condition thresholds for inclusion as the community. The vegetation in the drainage line to the north of the site, as well as the Swamp Oak trees within the site do not meet the condition threshold as:

- the patch is small, consisting of the 16 Swamp Oak trees on site, and the community in the drainage line to the north of the site (existing within a mosaic of Eucalypt species to the east and west) and not within close proximity (within at least 100 m) of other native vegetation patches. The patch in which the community occurs is intersected by boundaries including roads and cleared land;

- non-native species comprise more than 50% of total understorey vegetation in the drainage line to the north of the site, with no understorey species present in the site; and

- transformer species Morning Glory (*Ipomoea indica*) comprises more that 30% of total understorey vegetation (in the drainage line to the north of the site).

Therefore, the community to the north of and within the site does not fit into the EPBC Act listed community and is not subject to the referral, assessment, approval and compliance provisions of the EPBC Act and is not considered further in this assessment.

4.4 Fauna habitat

No habitat for fauna, such as tree hollows, logs or nests were observed during the site inspection. The trees to be removed may provide roosting and/or foraging habitat for some birds, on a transient basis; however, the birds would not be dependent on this habitat and it offers little ecological value in this highly disturbed context.

4.5 Threatened species habitat

No threatened flora or fauna species were recorded within the site. The likelihood that the species recorded or predicted to occur within the locality would occur within the site is assessed in Appendix A. The vegetation within the site is unlikely to be important for any threatened species due to the absence of suitable habitat features.

5 Impact assessment

5.1 Impact summary

The direct impacts arising from the project is the removal of 16 mature trees (consisting of 11 Swamp Oak, three Mugga Ironbark, one Grey Box and one *Eucalyptus* species) that cannot be retained under the current proposal.

Due to the industrial setting, it is unlikely that the project would have potential for any further indirect impacts than currently exists. The vegetation within and surrounding the site occurs as low-quality vegetation that is already heavily impacted by edge effects. The project will not significantly increase edge effects given the high level of existing clearance.

5.2 Avoid and minimise impacts

The principal means to reduce impacts to biodiversity values resulting from the project has been to avoid areas of biodiversity value and minimise the removal of native vegetation.

During the early planning stages of the project, W & J Lee Property Investments Pty Ltd engaged Eco Logical (2016) to undertake an Arboricultural Impact Assessment for the project. This assessment provided guidance on the native vegetation present within and adjacent to the site. As the project footprint was refined, W & J Lee Property Investments Pty Ltd then engaged EMM to undertake a Flora and Fauna Assessment (this report) and Tree Survey to undertake an Arboricultural Impact Assessment (2019) in light of the updated project footprint.

The current footprint will result in the removal of 16 mature trees and will leave 14 mature trees in place.

5.3 Assessments of Significance

Due to the dominance of Swamp Oak in the drainage line to the north of the site, this vegetation as well as the majority of trees in the site, align with *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions,* an EEC listed under the BC Act. Therefore, an Assessment of Significance ('the five part test') is required to assess the significance of the impacts of the project on this EEC.

Section 7.3 of the BC Act provides the criteria that must be considered in the Assessment of Significance of potential impacts on threatened species listed under the BC Act, as assessed within the following section.

5.3.1 Assessment of significance for Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

1. In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

Not applicable.

1. *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

    a) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction; or*

b) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;*

There is no mapped occurrence of this EEC within the immediate locality of the site. The vegetation along the northern edge of the site, in the drainage line, is mapped as 'Urban/Exotic Vegetation' with no PCT code assigned (OEH 2017a). However, the vegetation in this area as well as within the site (consisting of a single row of trees that bisect the site) is dominated by Swamp Oak. Therefore, the vegetation in the drainage line and remnant/regrowth Swamp Oak in the site have been included as the EEC, albeit in very poor condition due to past and current disturbance regimes. The proposal will consist of the removal of 11 mature Swamp Oak trees that occur in the line of trees that bisect the site.

The project will only result in a small reduction of the listed community (removal of 11 Swamp Oak trees) in the site. The vegetation community within the drainage line to the north of the site will not be removed. Eleven trees represents a small proportion of the community and will have a negligible impact on the extent of the community and the community will not be placed at risk of extinction.

2. *In relation to the habitat of a threatened species or ecological community:*

a) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or action;*

b) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or action;*

c) *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality;*

Eleven mature Swamp Oak trees will be removed within the site.

The trees to be removed are in a fragmented condition, away from the forested drainage line adjacent to the site. This means that the removal of these trees will not significantly change the structure of the adjacent forest. Removing these trees will not result in an area of habitat becoming fragmented or isolated and will not impact the survival of the ecological community in the locality.

The trees to be removed are not considered a good example of the community as they occur directly adjacent to the existing industrial activities and there are no understory species present (they exist as a row of trees over gravel hard stand). Abiotic factors have adversely affected the community in the northern drainage line beyond the site (to be retained) with weed species prevalent as well as tracks and rubbish occurring throughout the community. The activities proposed for the site are unlikely to exacerbate any indirect impacts to the community north of the site further, due to the existing use of the site (parking, hardstand, storage).

3. *Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (whether directly or indirectly);*

Not applicable

4. *Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of, a key threatening process.*

The key threatening process relevant to the development of the site is 'the clearing of native vegetation.' The removal of 11 mature Swamp Oak trees classifies as the clearing of native vegetation, as the project will remove parts of one or more strata layers of vegetation in these areas.

5.3.2 Conclusion

The removal of 11 mature Swamp Oak trees will not have a significant impact on the *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* EEC in the locality. The proposed clearing area is small and will occur within a highly fragmented patch (a single row of trees with no understorey) that represents a very low condition example of the EEC.

6 Assessment against key legislation

6.1 EPBC Act

An assessment of impacts from the project on Matters of National Significance (MNES) was prepared to determine whether the referral of the project to the Commonwealth Government Minister for the Environment is required. A likelihood of occurrence assessment considering each species has been completed in Appendix A and MNES matters relevant to the development are summarised in Table 6.1.

Table 6.1 Assessment of the project against the EPBC Act

MNES	Project specifics	Potential for significant impact
Threatened species	Twenty-eight threatened species have been recorded or are predicted to occur within the locality. These species are considered unlikely to occur within the site.	Significant impact unlikely to result from the project.
Threatened Ecological communities	No threatened ecological communities, as listed under the EPBC Act, were recorded within the site.	Significant impact unlikely to result from the project.
Migratory species	Seventeen migratory species have been recorded or are predicted to occur within the locality. The majority of these species are considered unlikely to occur within the study area and the study area does not provide habitat for an ecologically significant proportion of any of these species.	Significant impact unlikely to result from the project.
Wetlands of international importance	The site does not flow directly into a Ramsar site and the development is not likely to result in a significant impact.	Significant impact unlikely to result from the project.

All likelihood of occurrence assessments concluded that there is no habitat present for the MNES within the site and referral of the project to the Commonwealth Government Minister for the Environment is not required.

6.2 Biodiversity Conservation Act 2016

The project will not trigger any thresholds outlined in the BC Regulation and therefore does not trigger entry into the Biodiversity Offset Scheme (BOS), as explained in the following sections.

6.2.1 Area threshold

The study area is located on land with no minimum lot size specified. Therefore, according to the BC Regulation the actual size of the allotment of land on which the proposed development is to be carried out is to be referred to, which is approximately 0.5 ha. As shown in Table 6.2, this results in a clearing threshold of 0.25 ha. Clearance of native vegetation within the site (16 mature trees, with no understorey present) will be less than 0.25 ha and therefore the development does not trigger the area threshold for entry into the BOS.

Table 6.2 Area threshold for application of the Biodiversity Offsets Scheme

Minimum lot size of land	Area of clearing
Less than 1 ha	0.25 ha or more
Less than 40 ha but not less than 1 ha	0.5 ha or more
Less than 1000 ha but not less than 40 ha	1 ha or more
1000 ha or more	2 ha or more

6.2.2 Biodiversity values map

The development does not occur on land mapped on the biodiversity values map and therefore does not trigger this threshold for entry into the BOS.

6.2.3 Test of significance

Section 5 provides an Assessments of Significance (5-part test) for *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* EEC that occurs adjacent to the site. The assessment concluded that due to the small area of vegetation to be impacted, the development will not have a significant impact on the EEC and therefore does not trigger the area threshold for entry into the BOS.

Therefore, there is no trigger of the thresholds for entry into the BOS and the Biodiversity Assessment Method (BAM) (OEH 2017b) is not required, instead a Flora and Fauna Assessment is sufficient to assess potential impacts of the project on biodiversity (this report).

6.3 Biosecurity Act

No state or regional priority weeds as identified in the *Greater Sydney Regional Strategic Weed Management Plan* (GSLLS 2017), for the Greater Sydney Local Land Services (LLS) region were identified within or adjacent to the site.

Three weeds of concern for the Greater Sydney LLS region, Morning Glory, Small-leaved Privet and Cockspur coral tree, were recorded directly adjacent to the site (in the drainage line on the northern boundary). These species are listed as subject to local management programs, which are species that are high risk, high priority for a number of local programs and have significant environmental and/or animal health impacts. These weeds are classified under a General Biosecurity Duty (GBD) of the Biosecurity Act. The GBD reinforces that everyone shares the responsibility for weed biosecurity. For plants with a GBD, the intention is to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

7 Recommendations

Tree Survey (2019) have identified 14 trees outside of the footprint of the construction area that can be successfully retained. The tree protection plan (Appendix II of Tree Survey (2019), as included in Appendix C of this report) must be implemented for the trees to be retained.

A total of 16 trees are proposed for removal. Any loss of trees should be offset with replacement planting at a ratio of 2:1, in accordance with the *Georges River Council Tree Management Policy.* Examples of suitable replacement trees are included within Tree Survey (2019) (Appendix C of this report). All tree work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with *Australian Standard AS 4373-2007, Pruning of Amenity Trees* and *NSW Work Cover Code of Practice for the Amenity Tree Industry (1998).*

Table 7.1 summarises the recommendations to reduce clearing of native vegetation and then to mitigate residual impacts after all measures to avoid and minimise impacts have been considered.

Table 7.1 Recommended mitigation measures for direct impacts and indirect impacts

Impact	Action and outcome	Responsibility	Timing
Direct impact			
Clearing of native vegetation – retention of 14 mature trees.	• Undertake the tree protection plan (Appendix II and III of Tree Survey (2019), as included in Appendix C of this report) for all trees listed for retention (a total 14 trees). • Excavation within the tree protection zone of Tree 1, 2, and 19 should be carried out under the supervision of the project arborist. (see Appendix III). • Removal and demolition of existing structures within the TPZ must be carried out using tree sensitive methods (see Appendix II) • No over-excavation, battering, or benching shall be undertaken beyond the footprint of any structure unless approved by the project arborist. • Structural soil (with a particle size larger than that of the existing soil) should be used for any fill required in the TPZ. • Soils used for this purpose must be consistent with the existing soils and preferably sourced from the same area to reduce the risk of contamination. • Any underground services proposed within the TPZ must be installed using tree sensitive methods (see Appendix II) under the supervision of the project arborist.	Proponent	Prior to and during vegetation clearing
Clearing of native vegetation – clearing of 16 mature trees	• Avoid and minimise clearing impacts to the trees where possible. Clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development site. Tree clearing and disturbance will be limited to the development site. • Appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' should be installed. • Identify the location of any 'No Go Zones' in site inductions.	Proponent	Prior to and during vegetation clearing

Table 7.1 Recommended mitigation measures for direct impacts and indirect impacts

Impact	Action and outcome	Responsibility	Timing
Direct impact			
	• Adhere to the tree protection plan and tree protection map (Appendix II and III of Tree Survey (2019), as included in Appendix C of this report) for all trees listed for removal (a total 16 trees).		
Indirect impact			
Indirect impacts on retained forest (EEC) in the drainage line to the north of the site.	• Clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development site. Tree clearing and disturbance will be limited to the development site. • Appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' should be installed. • Identify the location of any 'No Go Zones' in site inductions. • Implement an erosion and sediment control plan, in accordance with a Construction Environmental Management Plan (CEMP) to prevent inputs of sediment and contaminated runoff into the forest to be retained, north of the proposed development site.	Proponent	Prior to and during works
Weeds	• Weeds of concern for the Greater Sydney LLS region have been identified on the northern boundary of the site. • It is recommended that the CEMP and associated Environmental Management Plan (EMP) for the project consider controls and management of these weeds.	Proponent	Prior to and during works

No additional mitigation measures have been recommended due to the low level of impact on the local biodiversity from the project.

8 Conclusion

The site inspection identified that the site has been predominantly cleared and is heavily disturbed due to past and current industrial land uses. A total of 21 trees, that bisect the lot, and an additional nine trees along the northern boundary of the site, are the most significant vegetation present.

The direct impacts arising from the project include the removal of 16 mature trees that cannot be retained under the current proposal.

Vegetation located to the north of the site and within a drainage line beyond the site, is dominated by Swamp Oak and the community aligns with *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions,* an EEC listed under the BC Act. The majority (11) of the 16 trees to be removed on site are also Swamp Oak, meaning that these trees also align with the BC Act listing of the EEC which includes recolonised patches and scattered trees. The EEC does not meet the condition thresholds for inclusion as the EPBC Act listed community, due to the poor condition of the vegetation. An Assessment of Significance, undertaken as per Section 7.3 of the BC Act, has concluded that the project will not result in a significant impact on this community.

The vegetation within the site does not represent habitat for any of the BC Act and EPBC Act listed threatened flora and fauna species recorded or predicted to occur within the locality due to the absence of suitable habitat. Therefore, there will not be any significant impact on any threatened species as a result of the project.

The project will not trigger any thresholds outlined in the BC Regulation and therefore does not require entry into the BOS and offsets are not required for the project.

Recommendations to reduce clearing of native vegetation and then to mitigate residual impacts after all measures to avoid and minimise impacts associated with the project have been provided.

9 References

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OEH (2017b) *Biodiversity Assessment Method*. Office of Environment and Heritage, August 2017.

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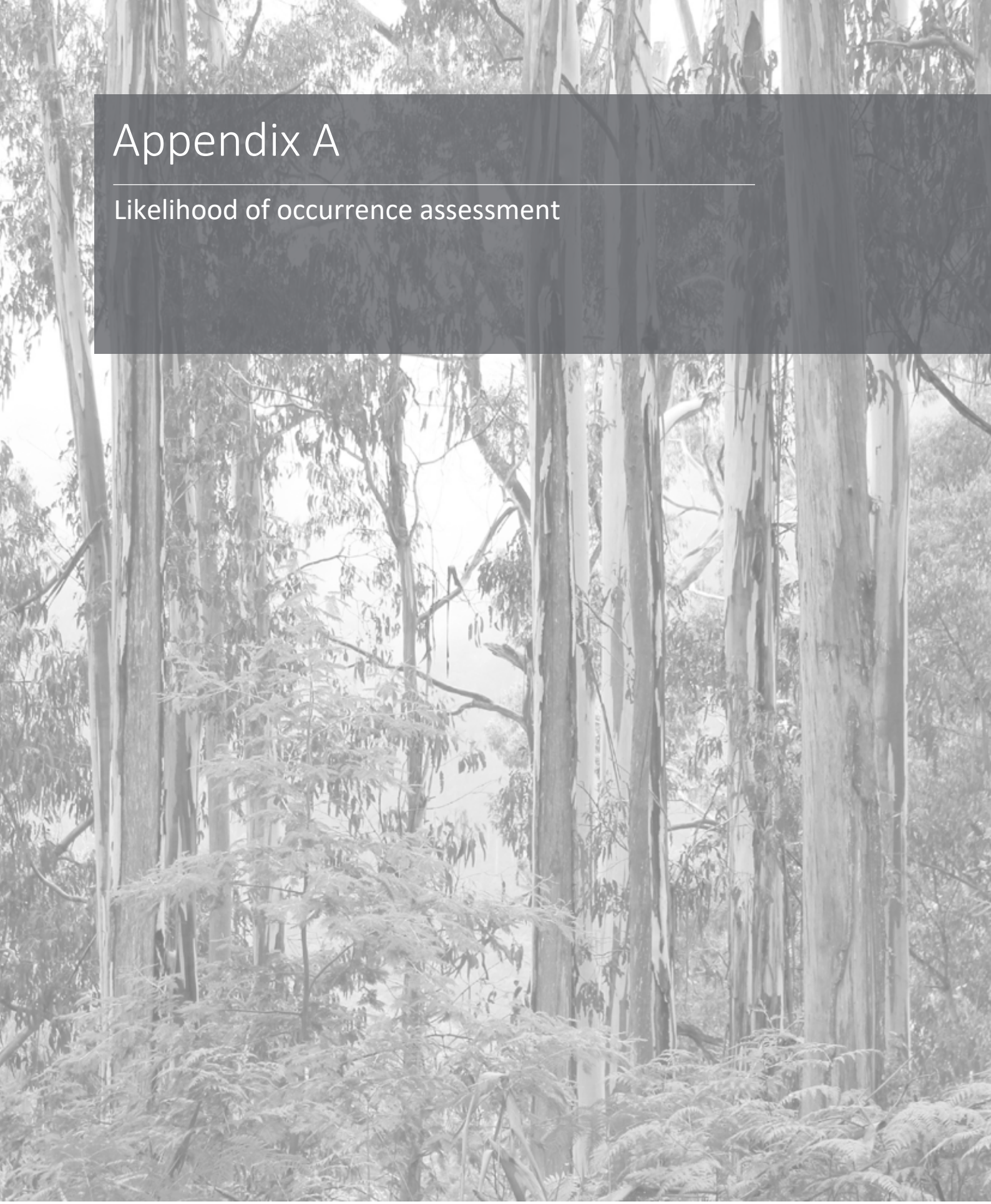


Appendix A

Likelihood of occurrence assessment

Table A.1 Likelihood of occurrence assessment

Scientific name	Common name	Listing		Source		Likelihood of occurrence	Justification
		BC Act	EPBC Act	NSW BioNet	PMST		
Listed Threatened Ecological Communities							
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion		-	E	-	Y	Absent	This community occurs in the Sydney Basin IBRA 7 Bioregion, typically occurring in the Castlereagh area, in Cumberland Plains North-West. There are known occurrences near Holsworthy, Kemps Creek and Longneck Lagoon just outside the North-West Castlereagh area (Cumberland sub-region). It occurs on Tertiary sands and gravels of the Hawkesbury-Nepean river system, which are low in nutrients. It is typically a low woodland, with canopy species reaching an average height of 15 m, a diverse mid layer of sclerophyll shrubs and patchy ground cover consisting of sedges and grasses. The canopy is composed of *Angophora bakeri* (Narrow Leaved Apple), *Eucalyptus racemosa* (Scribbly Gum), and *Eucalyptus parramattensis* (Parramatta Red Gum). The vegetation on and surrounding the site does not meet the species, structural or geological thresholds of the TEC.
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community		-	E	-	Y	Present	This forest community occurs from North of Gladstone down the east coast of Australia, to Bermagui in South-east NSW. Usually found in coastal catchments, close to sea-level and generally within 30 km of the coastline where groundwater is saline to brackish. The other coastal floodplain vegetation types it is associated with are other salt tolerant ecosystems such as saltmarsh and mangroves as well as freshwater wetlands littoral rainforests and swamp sclerophyll. The canopy is dominated by *Casuarina glauca* (Swamp Oak) with *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus botryoides* (bangalay), *Eucalyptus grandis* (Flooded Gum), *Eucalyptus longifolia* (Woollybutt), and *Eucalyptus robusta* (Swamp Mahogany) as potential emergent species. This TEC is present in the drainage line to the north of the site as well as within the line of trees that bisect the site.
Coastal Upland Swamps in the Sydney Basin Bioregion		-	E	-	Y	Absent	Occurring primarily on poor, permeable sandstone plateaus in headwater valleys. Between 200-450 m above sea-level, with gentle slopes on sandstone 'benches' and large amounts of seepage moisture. The Coastal Uplands swamp is exceedingly diverse and has a variable patchwork of vegetation which is determined by soil, site size, rainfall, occurrence of fire and other disturbance. The site does not occur at this altitude, and does not meet the species, structural or geological thresholds of the TEC.
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion		-	CE	-	Y	Absent	Endemic to the Cumberland IBRA sub-region on the Sydney Basin Bioregion. Most of this community is found between Penrith and Richmond with some patches in the Kemps Creek and Holsworthy areas. It grows on clay-rich tertiary alluvium and Wianamatta shale derived soils found adjacent to the tertiary alluviums. An open forest/low woodland that is generally dominated by *Eucalyptus fibrosa* (Broad-leaved Ironbark) and *Melaleuca decora* (Paperbark). The vegetation on and surrounding the site does not meet the species, structural or geological thresholds of the TEC.
Shale Sandstone Transition Forest of the Sydney Basin Bioregion		-	CE	-	Y	Absent	Occurs only in NSW, within the Sydney Basin IBRA Bioregion. This ecological community occurs between other communities that are found on shale or sandstone on the Cumberland Plain, Hornsby, Woronora and lower Blue Mountains plateau adjacent to the plain. It is a forest/woodland with a canopy of *Eucalyptus punctata* (Grey Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus fibrosa* (Broad-leaved ironbark), E. *tereticornis* (Forest Red Gum), *Eucalyptus resinifera* (Red Mahogany), *Eucalyptus eugenioides, Eucalyptus globoidea* and *Angophora bakeri* (Narrow-leaved Apple). The vegetation on and surrounding the site does not meet the species, structural or geological thresholds of the TEC.
Western Sydney Dry Rainforest and Moist Woodland on Shale		-	CE	-	y	Absent	This ecological community varies between low closed rainforest to moist open woodland on upper slopes and disturbed sites. Dominant species depend on the latitudinal range of the site, as well as the available water and shelter. In sheltered gullies, the dominant canopy species is *Melaleuca styphelioides* (Prickly-leaved paperbark). *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus moluccana* (Coastal Grey Box) and/or *Eucalyptus crebra* (Narrow-leaved Ironbark) grow as emergents in the rainforest form and transitions to a canopy in the moist woodlands. The vegetation on and surrounding the site does not meet the species, structural or geological thresholds of the TEC.
Listed Threatened Flora							
Acacia bynoeana	Bynoe's Wattle	E	V	y	-	Unlikely	Semi prostrate shrub growing in central eastern NSW spanning from the Hunter District, west to the Blue Mountains and south to the Southern Highlands. Grows in a variety of communities including; Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands and Sydney Coastal Heaths. Prefers open, slightly disturbed sites on sandy soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Acacia prominens	Gosford Wattle	E	-	y	-	Unlikely	Erect or spreading tree growing in a few sites at Carss Park and along the railway line at Penshurst. Grows in a variety of communities including Cumberland Dry Sclerophyll Forests, Sydney Coastal Dry Sclerophyll Forests, Eastern Riverine Forests and Northern Hinterland Wet Sclerophyll Forests. Grows in moist, protected areas in loamy and clay soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Acacia pubescens	Downy Wattle	V	V	y	Y	Unlikely	A spreading shrub primarily confined to the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers at Barden Ridge, Oakdale and Mountain Lagoon. Grows in Cooks/River Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland, usually within roadside and bushland remnants. Grows on shale, sandstone, alluvium and gravely soils, often including ironstone. There is no habitat for this species within the site and therefore it is considered unlikely to occur.

Table A.1 Likelihood of occurrence assessment

Scientific name	Common name	Listing		Source		Likelihood of occurrence	Justification
		BC Act	EPBC Act	NSW BioNet	PMST		
Acacia terminalis	Sunshine Wattle	E	E	y	-	Unlikely	Erect or spreading shrub limited to coastal areas spanning from the northern shores of Sydney Harbour to Botany Bay. Grows on creek banks, hillslopes or in shallow soil in rock crevices and sandstone platforms in cliffs in Sydney Coastal Dry Sclerophyll Forests, Coastal Headland Heaths, Sydney Coastal Heaths and Wallum Sand Heaths. Grows in sandy soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Caladenia tessellata	Thick Lip Spider Orchid	E	V	y	y	Unlikely	Small orchid recorded from the Wyong, Ulladulla and Braidwood regions with the Kiama and Queanbeyan populations believed to be extinct. Found in a wide variety of communities including Central Gorge Dry Sclerophyll Forests, Cumberland Dry Sclerophyll Forests, Coastal Floodplain Woodlands and Subalpine Woodlands. Grows on clay loam or sandy soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Epacris purpurascens var. *purpurascens*		V	-	y	-	Unlikely	Erect shrub distributed from Gosford in the north, Silverdale to the west, Narrabeen in the east and Avon Dam in the south. Grows in scrubs and swamps in a variety of communities including Cumberland Dry, Sydney Hinterland Dry, Northern Hinterland Wet, and Southern Tableland Wet Sclerophyll Forests, Eastern Riverine Forests, and Coastal Valley Grassy Woodlands. Grows in soils with a strong shale influence on sandstone substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Maundia triglochinoides		V	-	y	-	Unlikely	Perennial sedge restricted to coastal NSW from Wyong extending northwards to southern Queensland. Grows in shallow freshwater channels, lagoons, creeks, dams or swamps in a variety of communities including Coastal Floodplain Wetlands, Coastal Swamp Forests, Coastal Freshwater Lagoons, Coastal Heath Swamps and Coastal Valley Grassy Woodlands. Grows in heavy clay, low nutrient soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Melaleuca deanei	Deane's Paperbark	V	V	y	-	Unlikely	Medium sized shrub found growing in two distinct populations in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas along with a few outliers at Springwood and in the Wollemi National Park, Yalwal and the Central Coast regions. Grows in ridgetop woodland in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, South East Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths. Grows on sandstone substrates in alluvial soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Persoonia hirsuta	Hairy Geebung	E	E	y	y	Unlikely	Spreading, hairy shrub with a scattered distribution throughout Sydney from Singleton to the north, the east coast of Bargo to the south and the Blue Mountains to the west. Grows at elevations between 350 - 600 metres in a variety of communities including Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths and Southern Escarpment Wet Sclerophyll Forests. Grows in sandy soils on sandstone substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Pomaderris prunifolia	Plum-leaf Pomaderris	E	-	y	-	Unlikely	Small shrub restricted to the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas including Rydalmere, Rookwood Cemetery and The Crest at Bankstown. Found growing on rocky slopes adjacent to creek lines, road reserves and small gullies in Cumberland Dry Sclerophyll Forests including Cooks River/Castlereagh Ironbark Forest and Northern Hinterland Dry Sclerophyll Forests. Grows in shale soils on sandstone substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Rhodamnia rubescens	Scrub Turpentine	CE	-	y	-	Unlikely	A small shrub or small tree, to 25 m tall with densely tomentose young stems and a reddish-brown bark that is fissured and leaves that are strongly three-veined. This species is known to occur in coastal areas from Batemans Bay, NSW, to locations inland from Bundaberg, QLD. Individuals are generally found in rainforest transition zones, creek side riparian vegetation and wet sclerophyll on volcanically derived and sedimentary soils. It will happily pioneer in eucalyptus forest. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Syzygium paniculatum	Magenta Lilly Pilly	E	V	y	y	Unlikely	Small to medium sized rainforest tree restricted to a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Found growing on stabilized dunes near the sea in South Coast Sands Dry Sclerophyll Forests, Coastal Swamp Forests, Coastal Headland Heaths, Littoral Rainforests, Northern Hinterland Wet Sclerophyll Forests and Southern Lowland Wet Sclerophyll Forests. Grows on grey sandy, gravelly, silty or clay soils over sandstone substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur
Tetratheca juncea	Black-eyed Susan	V	V	y	-	Unlikely	Small shrub confined to the northern area of the Sydney Basin bioregion and the southern area of the North Coast bioregion in the Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock LGAs. Found growing at well drained sites which experience annual rainfall levels between 1000 and 1200 mm at elevations below 200 m in swampy heath and moist forests. Usually found growing in soils from the Awaba soil landscape comprising of low nutrient sandy, skeletal soils, sandy loam soils and clay soils on sandstone or conglomerate substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur

Table A.1 Likelihood of occurrence assessment

Scientific name	Common name	Listing		Source		Likelihood of occurrence	Justification
		BC Act	EPBC Act	NSW BioNet	PMST		
Wahlenbergia multicaulis	Tadgell's Bluebell	E	-	y	-	Unlikely	Medium sized, perennial tufted herb confined to 13 sites located at Thornleigh, Mount Ku-ring-gai, Rookwood, Chullora, Bass Hill, Bankstown, Georges Hall, Campsie, South Granville and Greenacre. Found growing in forests, woodlands, grasslands, wetlands, adjacent to watercourses and disturbed sites in a variety of communities including Sandstone Gully Forest, Cooks River / Castlereagh Ironbark Forest, Cumberland Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Coastal Valley Grassy Woodlands and Southern Lowland Wet Sclerophyll Forests. Grows on poorly drained, yellow podsolic soils interspersed with concretionary ironstone such as the Villawood soil series or Hawkesbury soil landscape. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Wilsonia backhousei	Narrow-leafed Wilsonia	V	-	y	-	Unlikely	Small, sprawling, matted shrub confined to the coastal between Mimosa Rocks National Park and Wamberal north of Sydney including Nelson's Lake, Potato Point, Sussex Inlet, Wowly Gully, Parramatta River at Ermington, Clovelly, Voyager Point, Wollongong and Royal National Park. Found growing on the margins of coastal saltmarshes and lakes in Coastal Floodplain Wetlands, Temperate Montane Grasslands, Mangrove Swamps and Saltmarshes. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Allocasuarina glareicola		E	E	-	Y	Unlikely	Small, depauperate shrub restricted to a few populations in the Richmond district with an outlier population at Voyager Point in Liverpool. Grows in Castlereagh Woodlands, Cumberland Dry Sclerophyll Forest, Sydney Hinterland Dry Sclerophyll Forest, Sydney Sand Flats Dry Sclerophyll Forests. Grows in lateritic soil. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	-	y	Unlikely	Orchid with a distribution spanning from Gibraltar Range National Park southwards to the coastal area near Orbost in Victoria. Grows in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Coastal Heath Swamps, New England Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows in sandy soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Genoplesium baueri	Bauer's Midge Orchid	E	E	-	y	Unlikely	Terrestrial orchid with 13 populations totalling 200 plants distributed between Ulladulla and Port Stephens. Grows on moss gardens in a variety of communities including Sydney Coastal Dry sclerophyll Forests, Sydney Coastal Heaths, Sydney Montane Heaths, Southern Lowland Wet Sclerophyll Forests and Sydney Hinterland Dry Sclerophyll Forests. Grows on sandstone substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Pimelea spicata	Spiked Rice-flower	E	E	-	y	Unlikely	Small erect or spreading shrub with populations occurring in two disjunct areas, one occurring on the Cumberland Plain from Marayong and Prospect Reservoir south to Narellan and Douglas Park, and the other occurring in the Illawarra from Landsdowne to Shellharbour and north Kiama. Grows in Maritime Grasslands and Coastal Valley Grassy Woodlands including Cumberland Plain Woodlands and Moist Shale Woodlands within the Cumberland Basin and in Coast Banksia Open Woodland Coastal Grasslands in the Illawarra region. Grows on well-structured clay soils. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Pterostylis saxicola	Sydney Plains Greenhood	E	E	-	y	Unlikely	Deciduous terrestrial orchid restricted to a few small populations located in Western Sydney between Freemans Reach in the north and Picton in the south including Georges River National Park. Found growing near streams in depression on sandstone rock shelves above cliff lines faces, moist, sheltered ridges and creek banks on mossy rocks in Temperate Montane Grasslands, Northern Warm Temperate Rainforests, Southern Warm Temperate Rainforests and Southern Tableland Wet Sclerophyll Forests. Grows in small pockets of shallow shale or shale/sandstone transition soils over sandstone substrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Thesium australe	Austral Toadflax	V	V	-	y	Unlikely	Small, straggling herb with a distribution comprising of small populations scattered along the coast of eastern NSW including the Northern and Southern Tablelands, Tasmania, Queensland and eastern Asia. A root parasite found growing on damp sites in grassland, grassy woodlands and coastal headlands often in association with Kangaroo Grass (*Themeda triandra*) in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Listed Threatened Amphibians							
Heleioporus australiacus	Giant Burrowing Frog	V	V	-	y	Unlikely	Prefers hanging swamps on sandstone shelves adjacent to perennial non-flooding creeks. Can also occur within shale outcrops within sandstone formations. Known from wet and dry forests and montane woodland in the southern part range. Individuals can be found around sandy creek banks or foraging along ridge-tops during or directly after heavy rain. Males often call from burrows located in sandy banks next to water. Spends the majority of its time in non-breeding habitat 20-250 m from breeding sites. There is no habitat for this species within the site and therefore it is considered unlikely to occur.

Table A.1 Likelihood of occurrence assessment

Scientific name	Common name	Listing		Source		Likelihood of occurrence	Justification
		BC Act	EPBC Act	NSW BioNet	PMST		
Litoria aurea	Green and Golden Bell Frog	E	V	y	y	Unlikely	Most existing locations for the species occur as small, coastal, or near coastal populations, with records occurring between south of Grafton and northern VIC. The species is found in marshes, dams and stream sides, particularly those containing bullrushes or spikerushes. Preferred habitat contains water bodies that are unshaded, are free of predatory fish, have a grassy area nearby and have diurnal sheltering sites nearby such as vegetation or rocks , although the species has also been recorded from highly disturbed areas including disused industrial sites, brick pits, landfill areas and cleared land. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Pseudophryne australis	Red-crowned Toadlet	V	-	y	-	Unlikely	Occurs on wetter ridge tops and upper slopes of sandstone formations on which the predominant vegetation is dry open forests and heaths. This species typically breeds within small ephemeral creeks characterised by a series of shallow pools that feed into larger semi-perennial streams. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Listed Threatened Birds							
Anthochaera phrygia	Regent Honeyeater	CE	CE	y	y	Unlikely	Key feed species identified in the National Recovery Plan for the Regent Honeyeater (DoE 2016) that occur within the site and surrounds comprise Mugga Ironbark (*Eucalyptus sideroxylon*). There are records of the Regent Honeyeater within the locality. Suitable foraging species occur on the boundary of the site, however, given the industrial nature of the site and surrounds, it is considered unlikely that the species would be reliant on seasonal foraging resources within the site.
Artamus cyanopterus	Dusky Woodswallow	V	-	y	-	Unlikely	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	y	-	Unlikely	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Dasyornis brachypterus	Eastern Bristlebird	E	E	-	y	Unlikely	Found in coastal woodlands, dense scrub and heathlands, particularly where it borders taller woodlands. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Grantiella picta	Painted Honeyeater	V	V	-	y	Unlikely	Found mainly in dry open woodlands and forests, where it is strongly associated with mistletoe. Often found on plains with scattered eucalypts and remnant trees on farmlands. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	y	-	Unlikely	A migratory species that is generally sedentary in Australia, although immature individuals and some adults are dispersive. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. It hunts over open terrestrial habitats. Feeds on birds, reptiles, fish, mammals, crustaceans and carrion. Roosts and makes nest in trees. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Hieraaetus morphnoides	Little Eagle	V	-	y	-	Unlikely	The Little Eagle is most abundant in lightly timbered areas with open areas nearby providing an abundance of prey species. It has often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. The Little Eagle nests in tall living trees within farmland, woodland and forests. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Lathamus discolor	Swift Parrot	E	CE	-	y	Unlikely	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*). Commonly used lerp infested trees include Grey Box (*E. microcarpa*), Grey Box (*E. moluccana*) and Blackbutt (*E. pilularis*). This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability. There are records of the Swift Parrot within the locality. Suitable foraging species occur on the site, however, given the industrial nature of the site and surrounds, it is considered unlikely that the species would be reliant on seasonal foraging resources within the site.
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	-	y	-	Unlikely	Found mainly in semi-arid and arid regions, in dry woodlands, particularly mallee - casuarina assemblages. Breed in the hollows of large trees, often near watercourse. There is no habitat for this species within the site and therefore it is considered unlikely to occur.

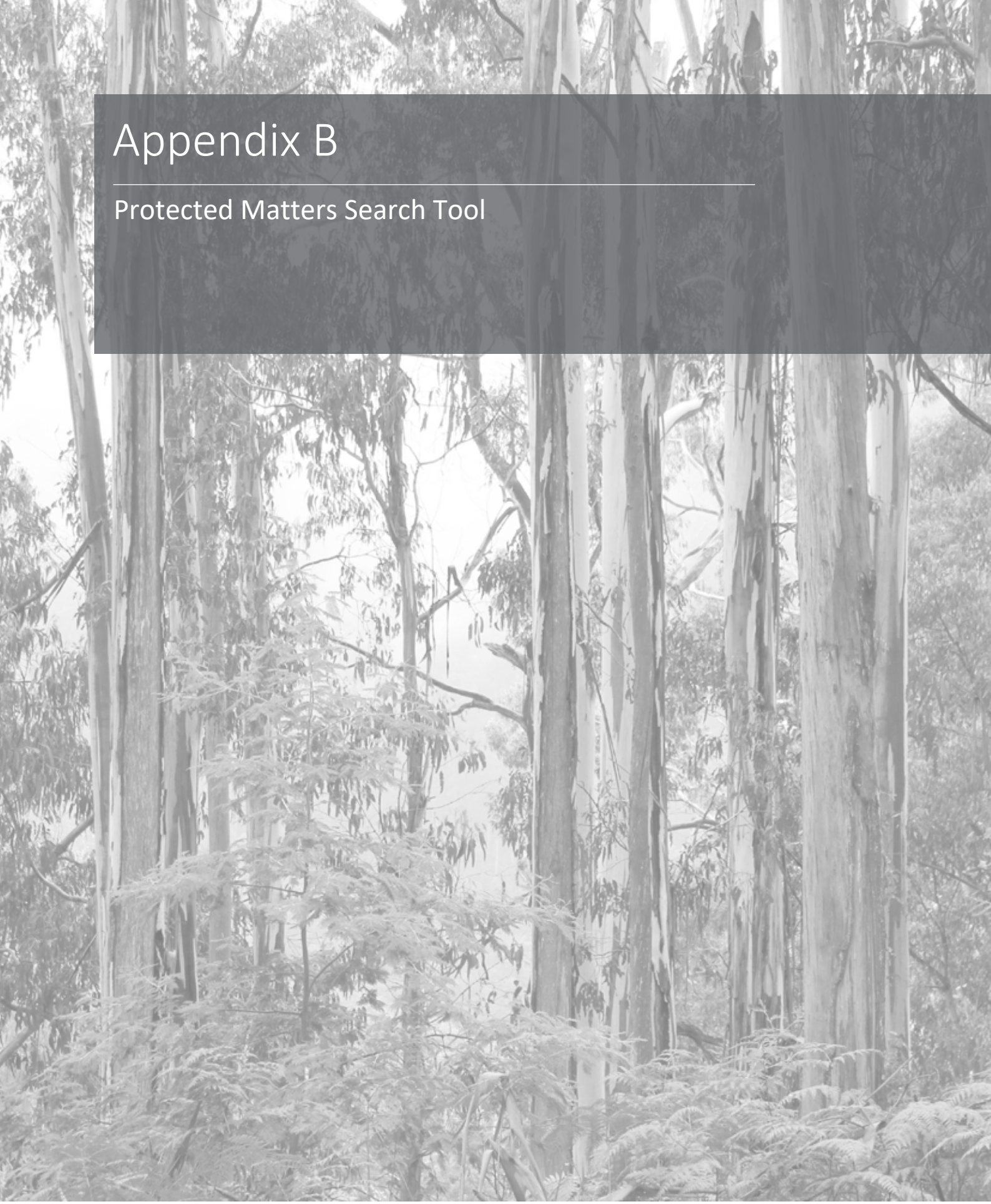
Table A.1 Likelihood of occurrence assessment

Scientific name	Common name	Listing		Source		Likelihood of occurrence	Justification
		BC Act	EPBC Act	NSW BioNet	PMST		
Lophoictinia isura	Square-tailed Kite	V	-	y	-	Unlikely	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated *by Eucalyptus longifolia, Corymbia maculata, E. elata*, or *E. smithii*. Individuals appear to occupy large hunting ranges of more than 100 km^2. They require large living trees for breeding, particularly near water with surrounding woodland /forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Neophema chrysogaster	Orange-bellied Parrot	E	CE	-	y	Unlikely	A single breeding population of fewer than 200 individuals occurs in a narrow coastal strip of south-west Tasmania. Adult birds depart Tasmania for the mainland in February. The first adults begin leaving the mainland for Tasmania in September with the last birds having departed by November. It is a coastal species inhabiting saltmarshes, sedgeplains, coastal dunes, pastures, shrublands and moorlands, generally within 10 km of the coast. Critical winter habitat for the species includes natural saltmarshes dominated by *Sarcocornia quinqueflora* (Beaded Glasswort) and Sclerostegia arbuscula (Shrubby Glasswort), as well as the associated grassy or weedy pastures. Historical records indicate that the Orange-bellied Parrot was formerly more abundant and widespread in NSW than it is now, however the species' distribution continues to extend into south-eastern NSW where suitable habitat is still available. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Neophema pulchella	Turquoise Parrot	V	-	y	-	Unlikely	Occurs in open woodlands and eucalypt forests with a ground cover of grasses and understorey of low shrubs. Generally found in the foothills of the Great Divide, including steep rocky ridges and gullies. Nest in hollow-bearing trees, either dead or alive; also, in hollows in tree stumps. Prefer to breed in open grassy forests and woodlands, and gullies that are moist. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Ninox strenua	Powerful Owl	V	-	y	-	Unlikely	The Powerful Owl occupies wet and dry eucalypt forests and rainforests. It may inhabit both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm. It has a large home range of between 450 and 1450 ha. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Pandion cristatus	Osprey	V	-	y	-	Unlikely	Found in coastal waters, inlets, estuaries and offshore islands. Occasionally found 100 km inland along larger rivers. It is water-dependent, hunting for fish in clear, open water. The Osprey occurs in terrestrial wetlands, coastal lands and offshore islands. It is a predominantly coastal species, generally using marine cliffs as nesting and roosting sites. Nests can also be made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Petroica phoenicea	Flame Robin	V	-	y	-	Unlikely	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The preferred habitat in summer includes moist eucalyptus forests and open woodlands, in winter prefers open woodlands and farmlands. It is considered migratory. Diet consists mainly of invertebrates. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Ptilinopus superbus	Superb Fruit-Dove	V	-	y	-	Unlikely	The Superb Fruit Dove ranges from northern NSW to as far south as Moruya. It is found in rainforests, closed forests (including mesophyll vine forests) and sometimes in eucalypt and acacia woodlands with fruit-bearing trees. It forages in the canopy of fruiting trees such as figs and palms. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Tyto novaehollandiae	Masked Owl	V	-	y	-	Unlikely	The Masked Owl is found in range of wooded habitats that provide tall or dense mature trees with hollows suitable for nesting and roosting. It is mostly seen in open forests and woodlands adjacent to cleared lands. Prey includes hollow-dependent arboreal marsupials and terrestrial mammals. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Listed Threatened Mammals							
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	-	y	Unlikely	Occurs from the Queensland border to Ulladulla, with largest numbers from the sandstone escarpment country in the Sydney Basin and Hunter Valley. Primarily found in dry sclerophyll forests and woodlands, but also found in rainforest fringes and subalpine woodlands. Forages on small, flying insects below the forest canopy. Roosts in colonies of between three and 80 in caves, Fairy Martin nests and mines, and beneath rock overhangs, but usually less than 10 individuals. Likely that it hibernates during the cooler months. The only known existing maternity roost is in a sandstone cave near Coonabarabran. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Dasyurus maculatus	Spotted-tailed Quoll (South-East Mainland Population)	V	E	y	-	Unlikely	Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Seventy per cent of the diet is medium-sized mammals, and also feeds on invertebrates, reptiles and birds. Individuals require large areas of relatively intact vegetation through which to forage. The home range of a female is between 180 and 1000 ha, while males have larger home ranges of between 2000 and 5000 ha. Breeding occurs from May to August. There is no habitat for this species within the site and therefore it is considered unlikely to occur.

Table A.1 Likelihood of occurrence assessment

Scientific name	Common name	Listing		Source		Likelihood of occurrence	Justification
		BC Act	EPBC Act	NSW BioNet	PMST		
Isoodon obesulus	Southern Brown Bandicoot (eastern)	E	E	-	y	Unlikely	This species prefers sandy soils with scrubby vegetation and/or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-	y	-	Unlikely	Occurs from Victoria to QLD, on both sides of the Great Dividing Range. Forms large maternity roosts (up to 100,000 individuals) in caves and mines in spring and summer. Individuals may fly several hundred kilometres to their wintering sites, where they roost in caves, culverts, buildings, and bridges. They occur in a broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. Has a fast, direct flight and forages for flying insects (particularly moths) above the tree canopy and along waterways. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Mormopterus norfolkensis	Eastern Freetail-bat	V	-	y	-	Unlikely	Distribution extends east of the Great Dividing Range from southern QLD to south of Sydney. Most records are from dry eucalypt forests and woodland. Individuals tend to forage in natural and artificial openings in forests, although it has also been caught foraging low over a rocky river within rainforest and wet sclerophyll forest habitats. The species generally roosts in hollow spouts of large mature eucalypts (including paddock trees), although individuals have been recorded roosting in the roof of a man-made structures. Foraging generally occurs within a few kilometres of roosting sites. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Perameles nasuta	Long-nosed Bandicoot	E	-	y		Unlikely	The Long-nosed bandicoot forages on invertebrates, fungi and tubers, leaving distinctive conical diggings as evidence of their foraging activities. The conical holes it leaves in the soil are often seen in areas of open grass. During the day it shelters in cryptic nests lined with leaves, grasses and debris. Individuals may shelter under older houses and buildings. There is no habitat for this species within the site and therefore it is considered unlikely to occur.
Phascolarctos cinereus	Koala	V	V	y	y	Unlikely	In NSW the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. Primary feed trees in the Central Coast KMA include *E. parramattensis*, *Eucalyptus robusta, E. tereticornis, E. microcorys, E. viminalis* and *E. amplifolia*. They are solitary with varying home ranges. There are no primary feed trees within the site and only one Secondary food tree (*E.moluccana*) present. There are no records within the locality and given the industrial site and surrounds, it is considered unlikely to occur.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	y	y	Unlikely	Occurs along the NSW coast, extending further inland in the north. This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Roosts in large colonies, commonly in dense riparian vegetation. There are records of Grey-headed Flying Fox within the locality. Suitable foraging species occur on the boundary of the site, however, given the industrial nature of the site and surrounds, it is considered unlikely that the species would be reliant on seasonal foraging resources within the site.
Listed Threatened Reptiles							
Hoplocephalus bungaroides	Broad-headed Snake	E	V	-	y	Unlikely	Mainly occurs in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they generally use rock crevices and exfoliating rock during the cooler months and tree hollows during summer. There is no habitat for this species within the site and therefore it is considered unlikely to occur.

Notes:
1. BC Act and EPBC Act status: V – Vulnerable, E – Endangered, CE – Critically Endangered, Mi – Migratory
2. Migratory wetland birds and fish recorded in the PMST and BioNet searches were excluded from the assessment as no wetland or aquatic habitat exists within or adjacent to the site.



Appendix B

Protected Matters Search Tool

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

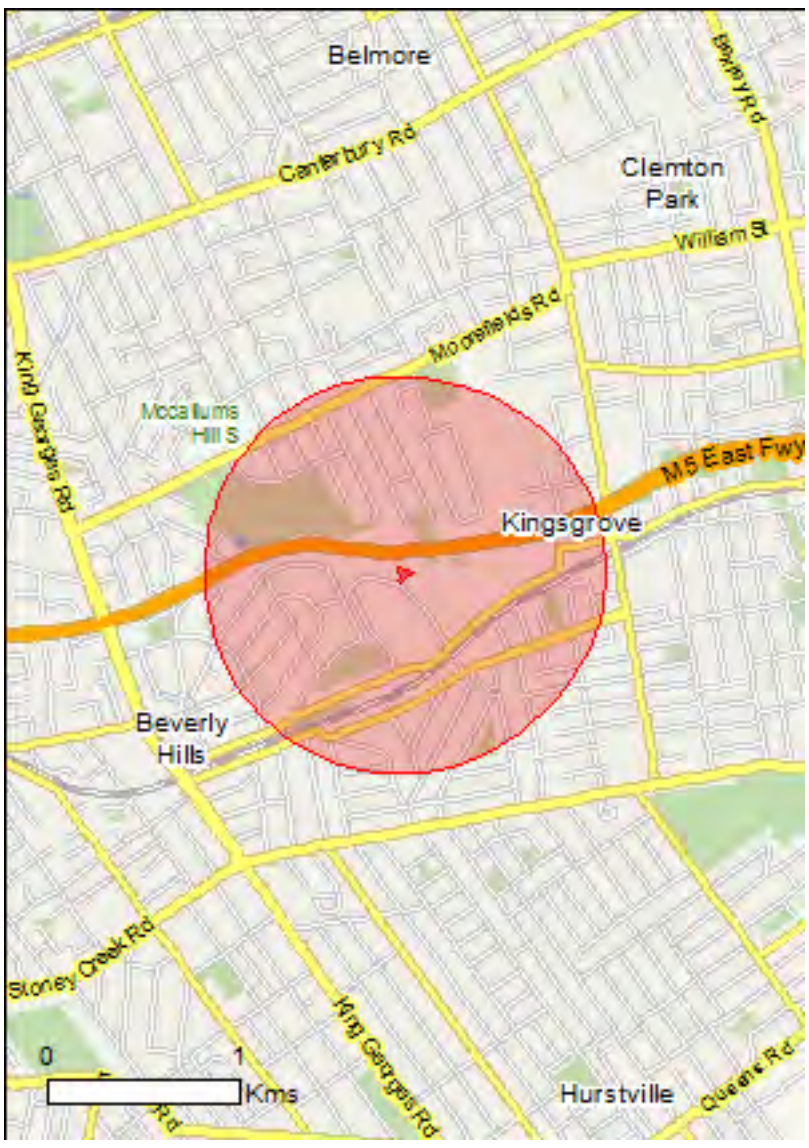
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 06/03/19 11:13:38

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

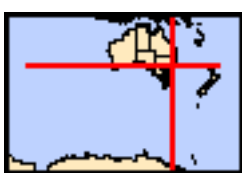
Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	28
Listed Migratory Species:	17

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	48
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Towra point nature reserve	Within 10km of Ramsar

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community may occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Dasyornis brachypterus		
Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Grantiella picta		
Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neophema chrysogaster		
Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species

Name	Status	Type of Presence
		habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Genoplesium baueri Yellow Gnat-orchid [7528]	Endangered	Species or species habitat likely to occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat may occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		

Name	Status	Type of Presence
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-33.941594 151.090761,-33.941425 151.090943,-33.941058 151.090718,-33.941213 151.091579,-33.941449 151.091123,-33.941663 151.090908,-33.941596 151.090763,-33.941596 151.090763,-33.941594 151.090761

Acknowledgements

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

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

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

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

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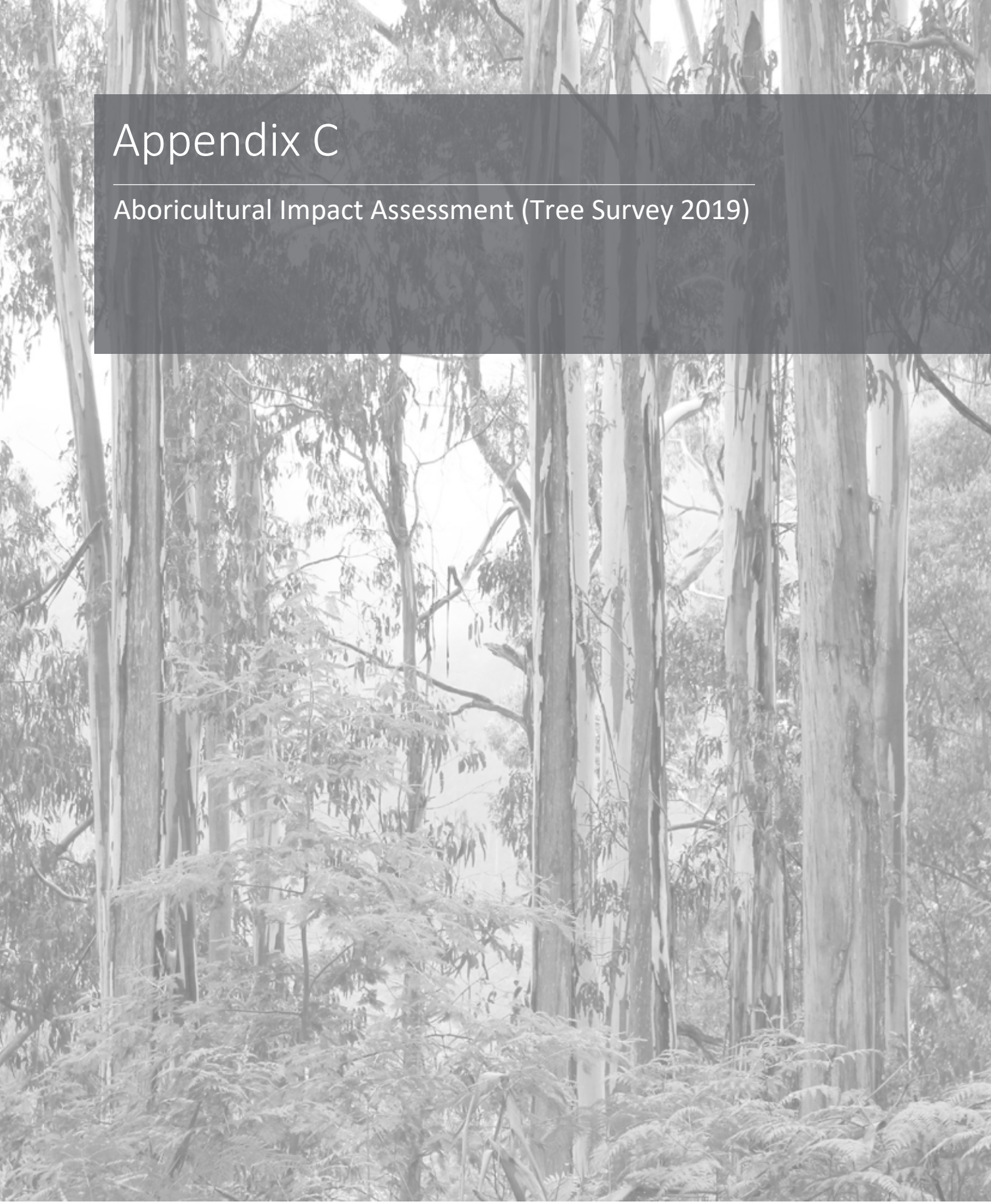

Appendix C

Aboricultural Impact Assessment (Tree Survey 2019)

TREE SURVEY
ARBORICULTURAL CONSULTANTS

ARBORICULTURAL IMPACT ASSESSMENT

2F The Crescent, Kingsgrove

Version 2

Prepared for:

W & J Lee Property Investments Pty Ltd

20 December 2019

Document information

Title:	2F The Crescent, Kingsgrove
Report type:	Arboricultural Impact Assessment (AIA)
Prepared by:	 **Phil Witten** Principal Arboricultural Consultant Registered Consulting Arborist No. 2458 AQF 5 | ISA | SRA-ANZ | AA | TRAQ | Adv.QTRA
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Document status

Document status	Date	Revision description
Version 1	12/12/19	Update to section 4.2
Version 2	20/12/19	Final version

Abbreviations

Abbreviation	Description
AQF	Australian Qualifications Framework
AS	Australian Standards
DBH	Diameter at Breast Height
Id	Identification
m	Metre
mm	Millimetre
NDE	Non-Destructive Excavation
NO	Number
NSW	New South Wales
sp.	Species
SRZ	Structural Root Zone
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment

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1 Background

1.1 Introduction

Tree Survey was commissioned by W & J Lee Property Investments Pty Ltd to prepare an Arboricultural Impact Assessment (AIA) for a proposed development at 2F The Crescent, Kingsgrove. The purpose of this report is to:

- Identify the trees within and adjacent to the proposed construction footprint.
- Assess the current health and condition of the subject trees.
- Assess the potential impacts of the development on the subject trees.
- Evaluate the significance of the subject trees and assess their suitability for retention.

1.2 The proposal

The key features of the proposal are summarised as follows:

- Construction of a commercial recycling facility including a gatehouse, truck weighbridge, OSD tank and thirteen (13) parking spaces.
- Landscaping and installation of associated services.

1.3 The subject trees

The site inspection was undertaken on the 30th of August 2019. A total of thirty (30) trees and one (1) group of trees were assessed and included in this report. Further information, observations, and measurements specific to each of the subject trees can be found in **Chapter 3**.

1.4 Documents and plans referenced

The conclusions and recommendations of this report are based on the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, the findings from the site inspections and analysis of the following documents/plans:

- *Georges River Council Tree Management Policy 2019.*
- *Robert Lee Architects - Proposed Site Plan, 11/12/19.*

Robert Lee Architects - Proposed Site Plan has been used as a base map for **Appendix I** and **III**.

1.5 Council tree preservation

All trees included in this report are protected under the conditions prescribed within the *Georges River Council Tree Management Policy 2019.*

2 Method

2.1 Visual tree assessment

The subject trees were assessed in accordance with a stage one visual tree assessment (VTA) as formulated by Mattheck & Breloer (1994)[1], and practices consistent with modern arboriculture.

The following limitations apply to this methodology:

- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing.
- Tree height and canopy spread were estimated unless otherwise stated.
- Trees within adjacent properties or restricted areas were not subject to a complete visual inspection (i.e., defects and abnormalities may be present but not recorded).
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

2.2 Retention value

The retention value of a tree or group of trees is determined using a combination of environmental, cultural, physical, and social values.

- **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Medium:** These trees are moderately important for retention. Their removal should only be considered if adversely affecting the proposed building/works, and all other alternatives have been considered and exhausted.
- **High:** These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by *Australian Standard AS4970 Protection of trees on development sites*.

This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Aboriculturalists (IACA) Significance of a Tree, Assessment Rating System (STARS). The system uses a scale of High, Medium, and Low significance in the landscape. Once the landscape significance of a tree has been defined, the retention value can be determined. Each tree must meet a minimum of three (3) assessment criteria to be classified within a category. Further details and the assessment criteria can be found in the **Appendices.**

[1] VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994). Principle explanations and illustrations are contained within the publication, Field Guide for Visual Tree Assessment by Mattheck, C., and Breloer, H. Arboricultural Journa1, Vol 18 pp 1-23 (1994).

2.3 Tree protection zones

- **Tree protection zone (TPZ):** The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process so that the tree can remain viable. The TPZ is an area that is isolated from the work zone to ensure no disturbance or encroachment occurs in this zone. Tree sensitive construction measures must be implemented if work is to proceed within the TPZ.
- **Structural root zone (SRZ):** The SRZ is the area of the root system (as defined by AS 4970-2009) used for stability, mechanical support, and anchorage of the tree. Severance of structural roots (>50 mm in diameter) within the SRZ is not recommended as it may lead to the destabilisation and/or decline of the tree.

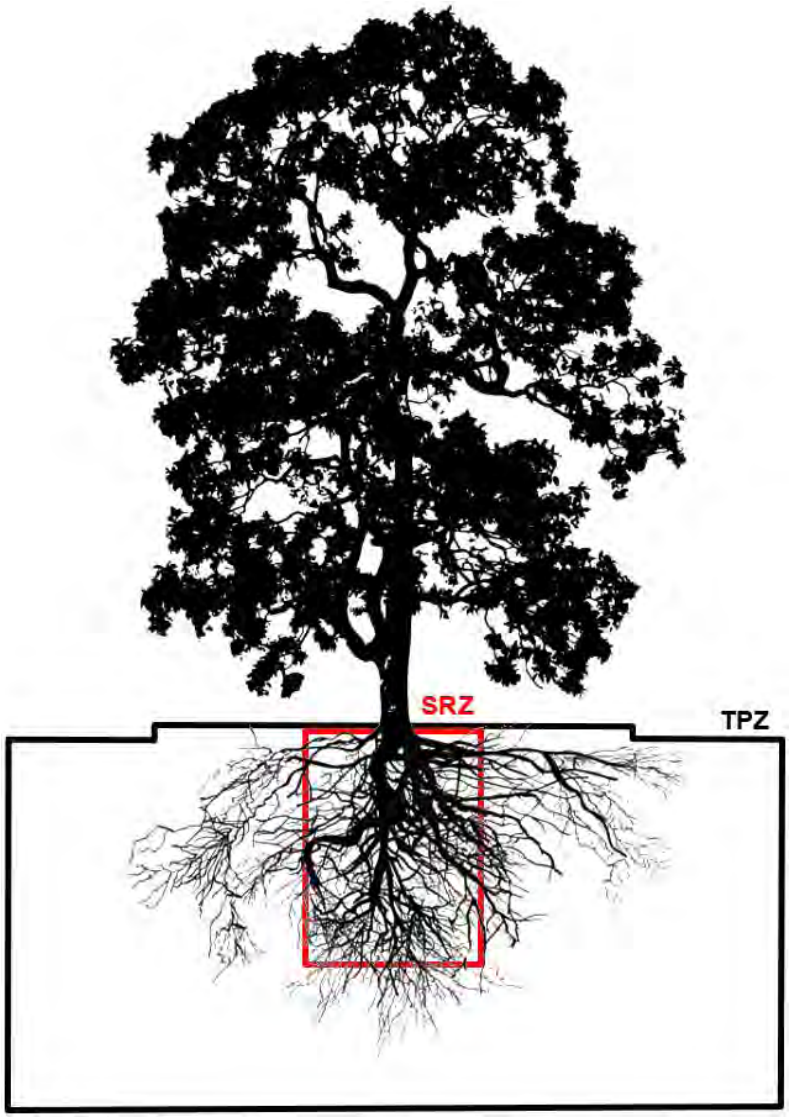


Figure 1: Indicative TPZ and SRZ

2.4 Impact assessment

- **No encroachment (0%):** No likely or foreseeable encroachment within the TPZ.
- **Minor encroachment (<10%):** If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ.
- **Major encroachment (>10%):** If the proposed encroachment is greater than 10% of the TPZ, the project arborist must demonstrate that the tree(s) remain viable. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ. Root investigation by non-destructive methods may be required for any proposed works within this area.

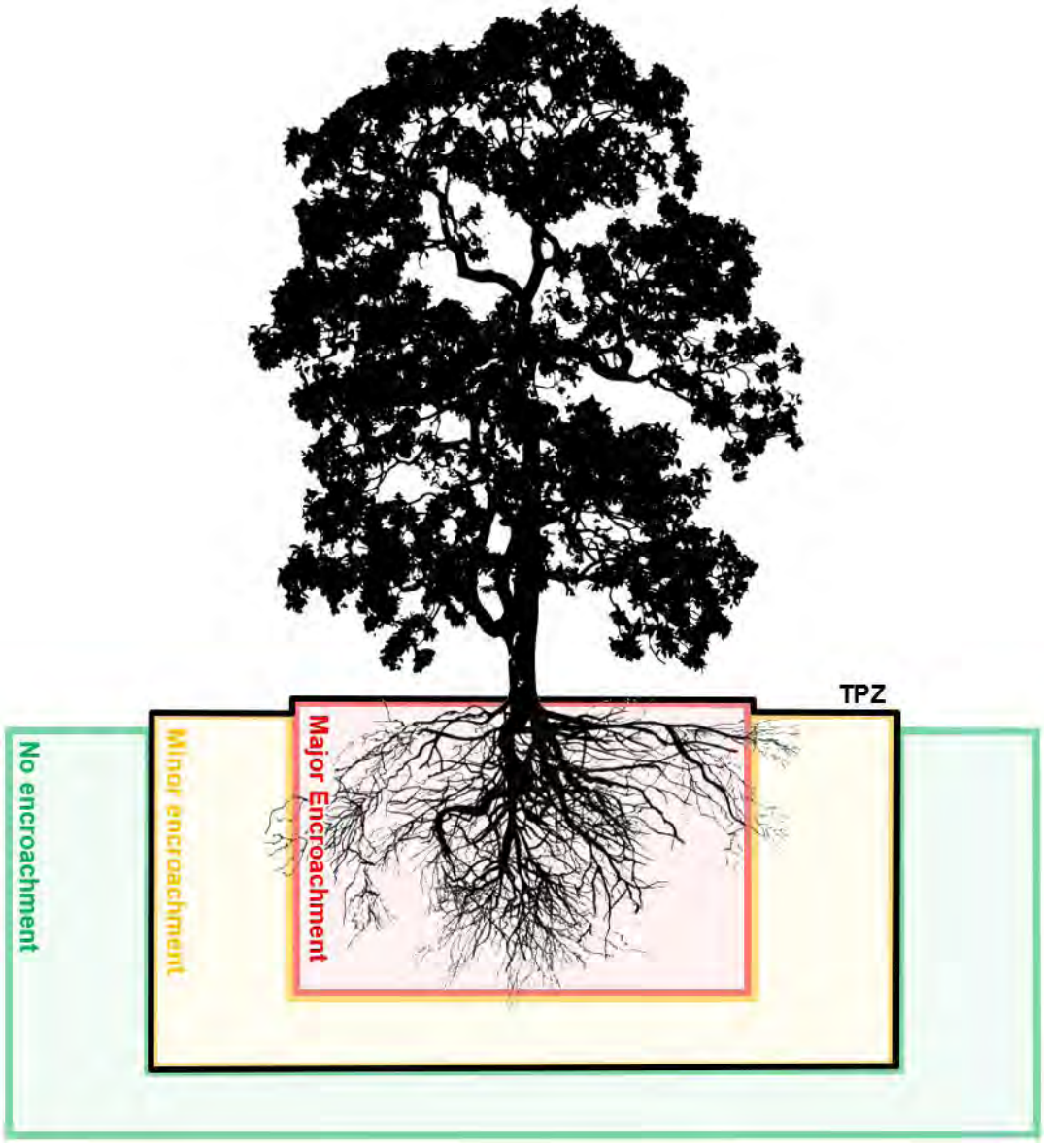


Figure 2: Indicative zones of encroachment within the TPZ

2.5 Mitigation measures

Encroachment within the TPZ must be compensated with a range of mitigation measures to ensure that impacts to the subject tree(s) are reduced or restricted wherever possible. Mitigation must be increased relative to the level of encroachment within the TPZ to ensure the subject tree(s) remain viable. The table below outlines requirements under AS 4970-2009, and mitigation measures required within each category of encroachment. These mitigation measures will only apply if trees are proposed to be retained.

Table 1: Mitigation measures

Encroachment	Mitigation Measures
No encroachment (0%)	• N/A
Minor encroachment (<10%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • Detailed root investigations should not be required. • Tree protection must be installed.
Major encroachment (>10%)	• The project arborist must demonstrate the tree(s) would remain viable. • Root investigation by non-destructive methods may be required for any trees proposed for retention. • Consideration of relevant factors, including root location and distribution, tree species, condition, site constraints, and design factors. • The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • The project arborist will be required to supervise any works within the TPZ. • Tree protection must be installed.

3 Results

Table 2 shows the results of the arboricultural assessment. Key points are:

3.1 Trees proposed for retention

No encroachment (0%): No likely or foreseeable encroachment within the TPZ:

- A total of **8** trees are located outside of the proposed construction footprint. No impacts on these trees are foreseeable under the current proposal.
- All trees and vegetation located within the drainage reserve at the rear of the property **(Group A)** are located outside of the proposed construction footprint. No impacts on these trees are foreseeable under the current proposal.

Minor encroachment (<10%): The proposed encroachment is less than 10% of the TPZ:

- A total of **3** trees **(Tree 3, 5, 6)** will be subject to a minor encroachment of less than **10%** within the TPZ. The encroachment will not impact upon the SRZ and is unlikely to impact the overall health or condition of the trees. Under the current proposal, these trees can be successfully retained.

Major encroachment (10-20%): The proposed encroachment is between 10-20% of the TPZ:

- A total of **3** trees **(Tree 1, 2, 19)** will be subject to an encroachment between **10-20%** within the TPZ. The encroachment will not impact the SRZ and is unlikely to impact the overall health or condition of the trees providing mitigation measures are implemented (see **Chapter 4**). Under the current proposal, these trees can be successfully retained.

3.2 Trees proposed for removal

Major encroachment (>20%): The proposed encroachment is greater than 20% of the TPZ:

- A total of **16** trees will be subject to an encroachment of greater than 20% within the TPZ. These trees are located within, or directly adjacent to the proposed construction footprint and cannot be retained under the current proposal.

3.3 Discussion

The tree protection zone (TPZ) is the optimal combination of the crown and root area that requires protection during the construction process so that the tree can remain viable. The TPZ is an area that is isolated from the work zone to ensure no disturbance or encroachment occurs in this zone. The TPZ (as defined by *AS 4970-2009*) is calculated by measuring the diameter at breast height (DBH) and multiplying it by twelve (12). The resulting value is applied as a radial measurement from the centre of the trunk to delineate the TPZ.

Encroachment within the TPZ is acceptable, providing that the arborist can demonstrate that the tree will remain viable. In general, up to 20% encroachment is usually considered acceptable, providing that the tree is healthy, and a number of mitigation measures are applied. Encroachment of greater than 20% (of the total TPZ area) can begin to impact the structural root zone (SRZ) and is generally more difficult to mitigate. Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree. For the purposes of this assessment, trees within an encroachment of greater than 20% have been recommended for removal.

Table 2: Results of the arboricultural assessment

Id.	Botanical name	Height (metres)	Spread (metres diameter)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH (millimetres diameter)	TPZ (metres radius)	SRZ (metres radius)	Encroachment	% Encroachment within TPZ	Other notes	Proposal
1	*Eucalyptus sideroxylon*	14	8	Good	Fair	Mature	Medium	Medium	High	500	6	2.5	**Major**	20%	Tree is located **adjacent** to the development footprint	**Retain**
2	*Casuarina glauca*	14	8	Good	Good	Mature	Medium	Medium	High	400	4.8	2.3	**Major**	12%	Tree is located **adjacent** to the development footprint	**Retain**
3	*Casuarina glauca*	13	6	Good	Good	Mature	Medium	Medium	High	350	4.2	2.1	**Minor**	9%	Tree is located **adjacent** to the development footprint	**Retain**
4	*Eucalyptus sideroxylon*	14	5	Fair	Fair	Mature	Medium	Medium	High	450	5.4	2.4	**Major**	36%	Tree is located **adjacent** to the development footprint	**Remove**
5	*Casuarina glauca*	14	3	Good	Good	Mature	Medium	Medium	High	300	3.6	2	**Minor**	2%	Tree is located **adjacent** to the development footprint	**Retain**
6	*Casuarina glauca*	15	5	Good	Good	Mature	Medium	Medium	High	400	4.8	2.3	**Minor**	4%	Tree is located **adjacent** to the development footprint	**Retain**
7	*Eucalyptus sideroxylon*	15	5	Fair	Good	Mature	Medium	Medium	High	450	5.4	2.4	**Major**	27%	Tree is located **adjacent** to the development footprint	**Remove**
8	*Casuarina glauca*	8	4	Fair	Fair	Semi-mature	Low	Medium	Medium	250	3	1.9	**Major**	54%	Tree is located **inside** the development footprint	**Remove**
9	*Casuarina glauca*	12	4	Good	Good	Mature	Medium	Medium	High	250	3	1.9	**Major**	62%	Tree is located **inside** the development footprint	**Remove**
10	*Eucalyptus sp*	14	7	Good	Fair	Mature	Medium	Medium	High	450	5.4	2.4	**Major**	64%	Tree is located **inside** the development footprint	**Remove**
11	*Casuarina glauca*	15	5	Good	Good	Mature	Medium	Medium	High	450	5.4	2.4	**Major**	72%	Tree is located **inside** the development footprint	**Remove**
12	*Casuarina glauca*	13	4	Fair	Fair	Mature	Low	Medium	Medium	300	3.6	2	**Major**	70%	Tree is located **inside** the development footprint	**Remove**
13	*Casuarina glauca*	15	4	Good	Good	Mature	Medium	Medium	High	300	3.6	2	**Major**	56%	Tree is located **inside** the development footprint	**Remove**
14	*Casuarina glauca*	15	4	Good	Good	Mature	Medium	Medium	High	250	3	1.9	**Major**	47%	Tree is located **adjacent** to the development footprint	**Remove**
15	*Casuarina glauca*	15	5	Good	Good	Mature	Medium	Medium	High	350	4.2	2.1	**Major**	58%	Tree is located **inside** the development footprint	**Remove**
16	*Eucalyptus sideroxylon*	15	7	Fair	Good	Mature	Medium	Medium	High	450	5.4	2.4	**Major**	37%	Tree is located **adjacent** to the development footprint	**Remove**
17	*Casuarina glauca*	15	5	Fair	Poor	Mature	Low	Medium	Low	300	3.6	2	**Major**	56%	Tree is located **inside** the development footprint	**Remove**
18	*Casuarina glauca*	15	5	Fair	Poor	Mature	Low	Medium	Low	300	3.6	2	**Major**	60%	Tree is located **inside** the development footprint	**Remove**
19	*Eucalyptus sideroxylon*	13	6	Good	Fair	Mature	Medium	Medium	High	350	4.2	2.1	**Major**	16%	Tree is located **adjacent** to the development footprint	**Retain**
20	*Eucalyptus sideroxylon*	15	7	Good	Fair	Mature	Medium	Medium	High	450	5.4	2.4	**Major**	39%	Tree is located **adjacent** to the development footprint	**Remove**
21	*Eucalyptus moluccana*	14	4	Fair	Fair	Mature	Medium	Medium	High	300	3.6	2	**Major**	32%	Tree is located **adjacent** to the development footprint	**Remove**
22	*Casuarina glauca*	16	6	Fair	Fair	Mature	Low	Medium	Medium	400	4.8	2.3	**Major**	45%	Tree is located **adjacent** to the development footprint	**Remove**
23	*Eucalyptus sp*	14	6	Fair	Fair	Semi-mature	Low	Medium	Low	250	3	1.9	**No**	0%	Tree is located **outside** the development footprint	**Retain**
24	*Casuarina glauca*	12	6	Fair	Fair	Mature	Low	Medium	Medium	300	3.6	2	**No**	0%	Tree is located **outside** the development footprint	**Retain**
25	*Casuarina glauca*	16	6	Fair	Fair	Mature	Low	Medium	Medium	300	3.6	2	**No**	0%	Tree is located **outside** the development footprint	**Retain**
26	*Eucalyptus grandis*	28	16	Good	Good	Mature	Medium	Medium	High	600	7.2	2.7	**No**	0%	Tree is located **outside** the development footprint	**Retain**

Id.	Botanical name	Height (metres)	Spread (metres diameter)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH (millimetres diameter)	TPZ (metres radius)	SRZ (metres radius)	Encroachment	% Encroachment within TPZ	Other notes	Proposal
27	*Eucalyptus grandis*	28	16	Good	Good	Mature	Medium	Medium	High	550	6.6	2.6	**No**	0%	Tree is located **outside** the development footprint	**Retain**
28	*Eucalyptus grandis*	28	12	Good	Good	Mature	Medium	Medium	High	400	4.8	2.3	**No**	0%	Tree is located **outside** the development footprint	**Retain**
29	*Eucalyptus botryoides*	26	18	Good	Good	Mature	Medium	Medium	High	600	7.2	2.7	**No**	0%	Tree is located **outside** the development footprint	**Retain**
30	*Eucalyptus saligna*	28	16	Good	Good	Mature	Medium	Medium	High	500	6	2.5	**No**	0%	Tree is located **outside** the development footprint	**Retain**
Group A • The subject trees are located within a stormwater drainage channel adjacent to the northern boundary of the subject site. • The trees comprise primarily of two species; *Casuarina glauca* and *Erythrina crista-galli.* • A sloping batter is located along the stormwater channel. The batter is approximately 3m in length and slopes downwards from the site boundary into the drainage channel. The bottom of the batter is approximately 2m below the existing ground level within the subject site. The majority of the trees are located at the bottom of the batter, at least 3-4m away from the site boundary. • The proposed construction footprint is located far enough away from the trees within the stormwater channel that it will not cause any impacts. These trees can be retained under the current proposal.												**No**	0%	The trees are located **outside** the development footprint	**Retain**

4 Recommendations

4.1 Trees proposed for retention

A total of **14** individual trees and **1** group of trees are proposed for retention. The following mitigation measures will be required:

- The tree protection plan (**Appendix II**) must be implemented.

4.2 Site-specific tree protection measures

- Excavation within the tree protection zone of **Tree 1, 2,** and **19** should be carried out under the supervision of the project arborist. (see **Appendix III**).
- Removal and demolition of existing structures within the TPZ must be carried out using tree sensitive methods (see **Appendix II**).
- No over-excavation, battering, or benching shall be undertaken beyond the footprint of any structure unless approved by the project arborist.
- Structural soil (with a particle size larger than that of the existing soil) should be used for any fill required in the TPZ. Soils used for this purpose must be consistent with the existing soils and preferably sourced from the same area to reduce the risk of contamination.
- Any underground services proposed within the TPZ must be installed using tree sensitive methods (see **Appendix II**) under the supervision of the project arborist.

4.3 Trees proposed for removal

A total of **16** trees are proposed for removal. Any loss of trees should be offset with replacement planting at a ratio of 2:1, in accordance with the *Georges River Council Tree Management Policy*. Examples of suitable replacement species are included below:

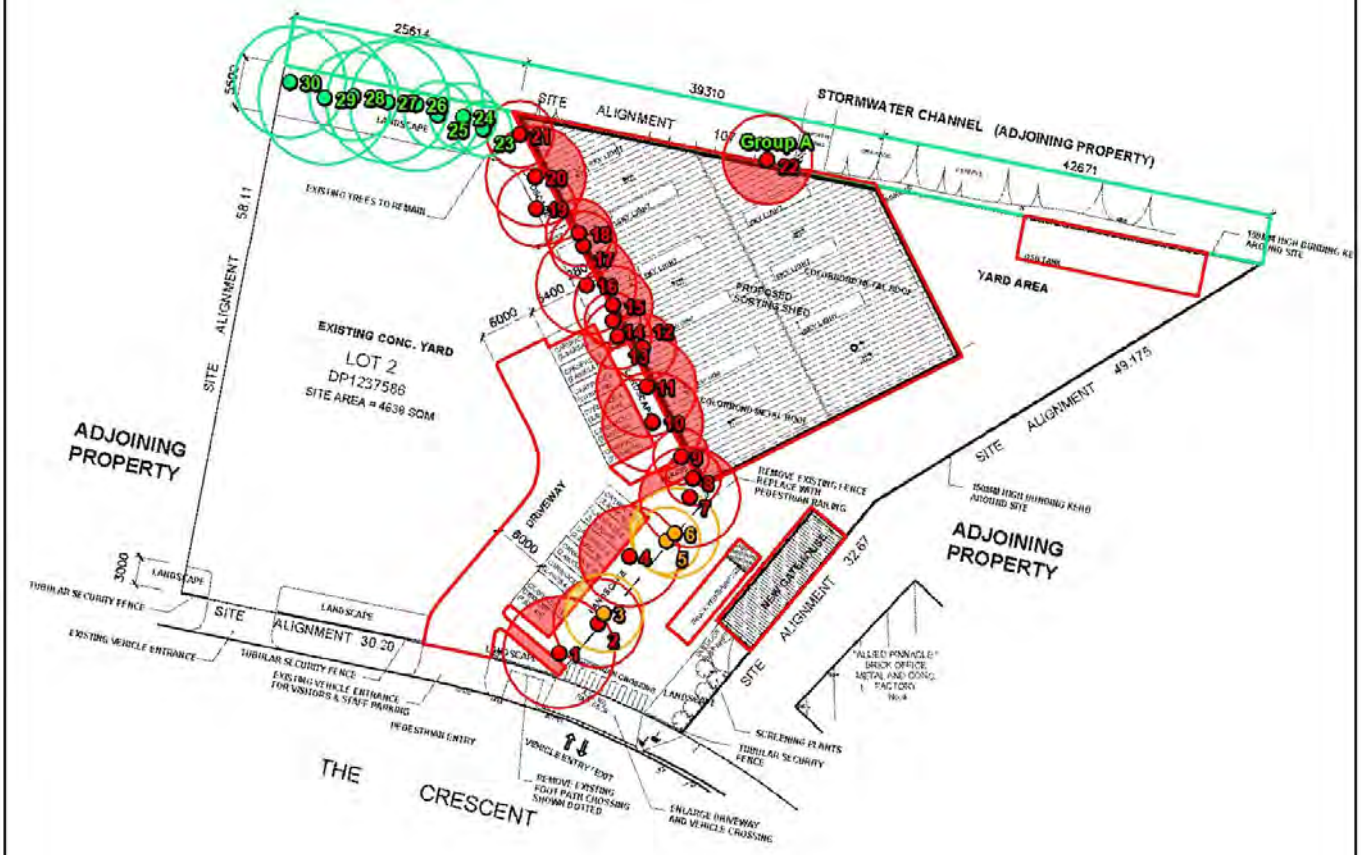
- *Acmena smithii* (Lillypilly)
- *Angophora hispida* (Dwarf Apple)
- *Banksia integrifolia* (Coastal Banksia)
- *Banksia serrata* (Old Man Banksia)
- *Callicoma serratifolia* (Black Wattle)
- *Callistemon salignus* (Willow Bottlebrush)
- *Ceratopetalum apetalum* (Coachwood)
- *Ceratopetalum gummiferum* (Christmas Bush)
- *Elaeocarpus reticulatus* (Blueberry Ash)
- *Melaleuca linariifolia* (Snow in Summer)
- *Melaleuca stylphelioides* (Prickly-leaved Paperbark)
- *Syzygium paniculatum* (Magenta Cherry)
- *Tristaniopsis laurina* (Water Gum)

All tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with *Australian Standard AS 4373-2007, Pruning of Amenity Trees* and the *NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).*

Appendix I **- Impact assessment**

Arboricultural Impact Assessment

Page 1 of 2



Legend

The subject trees
- No encroachment
- Minor encroachment
- Major encroachment

Protection zones
- TPZ (continuous line)
- SRZ (dashed line)
- Encroachment (shaded area)

Other items
- Disturbance footprint

0 5 10 20 Meters

N

TREE SURVEY
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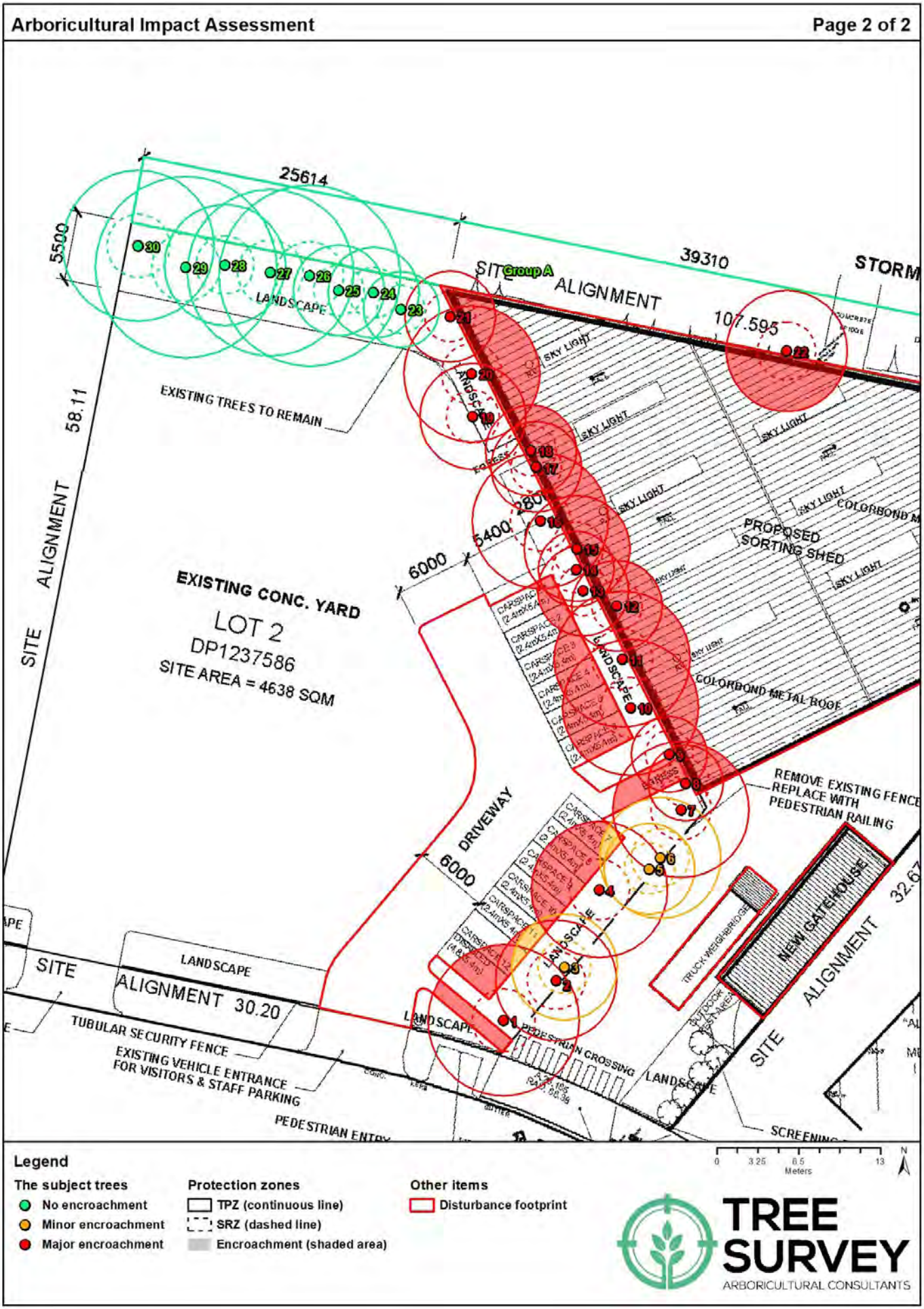

Arboricultural Impact Assessment
Page 2 of 2
25614
5500
39310
STORM
SITE Group A
ALIGNMENT
107.595
LANDSCAPE
EXISTING TREES TO REMAIN
SKY LIGHT
58.11
SITE ALIGNMENT
EXISTING CONC. YARD
LOT 2
DP1237586
SITE AREA = 4638 SQM
5400
6000
PROPOSED
SORTING SHED
COLORBOND METAL ROOF
REMOVE EXISTING FENCE
REPLACE WITH
PEDESTRIAN RAILING
DRIVEWAY
6000
NEW GATEHOUSE
TRUCK WEIGHBRIDGE
SITE
ALIGNMENT 30.20
LANDSCAPE
TUBULAR SECURITY FENCE
EXISTING VEHICLE ENTRANCE
FOR VISITORS & STAFF PARKING
PEDESTRIAN ENTRY
PEDESTRIAN CROSSING
SCREENING
Legend
The subject trees
No encroachment
Minor encroachment
Major encroachment
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Encroachment (shaded area)
Other items
Disturbance footprint
0 3.25 6.5 13
Meters
N
TREE SURVEY
ARBORICULTURAL CONSULTANTS

Appendix II **- Tree protection plan**

Tree protection fencing

Tree protection fencing must be established at the locations shown in **Appendix III**. Existing fencing, site hoarding, or structures (such as a wall or building) may be used as tree protection fencing, providing the TPZ remains isolated from the construction footprint.

Tree protection fencing must be installed prior to site establishment and remain intact until the completion of works. Once erected, protective fencing must not be removed or altered without the approval of the project arborist.

Tree protection fencing shall be:

- Enclosed to the full extent of the TPZ (or as specified in the Recommendations and Tree Protection Plan).
- Temporary mesh panel fencing (minimum height 1.8m).
- Certified and inspected by the project arborist.
- Installed prior to the commencement of works.
- Prominently signposted with 300mm x 450mm boards stating, “NO ACCESS - TREE PROTECTION ZONE.”

If tree protection fencing cannot be installed due to sloping or uneven ground, tree protection barriers must be installed as an alternative.

Specifications for tree protection barriers are as follows:

- Star pickets spaced at 2m intervals,
- Connected by a continuous high-visibility barrier/hazard mesh.
- Maintained at a minimum height of 1m.

Where approved works are required within the TPZ, fencing may be setback to provide construction access. Trunk, branch, and ground protection shall be installed and must comply with *AS 4970-2009, Protection of Trees on Development Sites*. Any additional construction activities within the TPZ of the subject trees must be assessed and approved by the project arborist.

Trunk protection

Where the provision of tree protection fencing is impractical or must be temporarily removed, trunk protection shall be installed to avoid accidental mechanical damage.

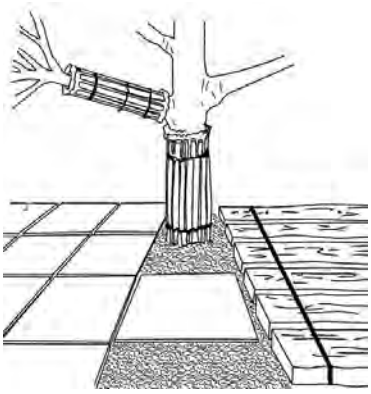
Specifications for trunk protection are as follows:

- A thick layer of carpet underfelt, geotextile fabric, or similar wrapped around the trunk to a minimum height of 2m.
- 1.8m lengths of softwood timbers aligned vertically and spaced evenly around the trunk (with a small gap of approximately 50mm between the timbers).
- The timbers must be secured using galvanised hoop strap (aluminium strapping).

The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree.

Ground protection

If temporary access for vehicle, plant or machinery is required within the TPZ ground protection shall be installed. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Where possible, areas of the existing pavement shall be used as ground protection.



Specifications for light traffic access (<3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- A layer of mulch or crushed rock (at a minimum depth of 100mm)

Specifications for heavy traffic access (>3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- A layer of lightly compacted road base (at a minimum depth of 200mm)
- Geotextile fabric shall extend a minimum 300mm beyond the edge of the road base.

Pedestrian, vehicular, and machinery access within the TPZ shall be restricted solely to areas where ground protection has been installed.

Excavations

All approved excavations (including root investigations) within the TPZ must be carried out using tree sensitive methods under the supervision of the project arborist. These methods may include:

- Manual excavation (hand tools).
- Air spade.
- Hydro-vacuum excavations (sucker-truck).

Where approved by the project arborist, excavations using compact machinery fitted with a flat-bladed bucket is permissible. Excavations using compact machinery shall be undertaking in small increments and guided by the Project Arborist, who is to look for and prevent root damage to roots (>50mm in diameter).

Exposed roots shall be protected from direct sunlight, drying out, and extremes of temperature by covering with geotextile fabric, and plastic membrane or glad wrap (where practical). Coverings shall be weighted to secure them in place. The geotextile fabric shall be kept damp at all times.

No over-excavation, battering, or benching shall be undertaken beyond the footprint of any structure unless approved by the project arborist. Hand excavation and root mapping shall be undertaken along excavation lines within the TPZ prior to the commencement of mechanical excavation (to prevent tearing and shattering of roots from excavation equipment). Any conflicting roots (>50mm in diameter) shall be pruned using clean, sharp secateurs or a pruning saw to ensure a clean cut, free from tears. All root pruning must be documented and carried out by the project arborist.

Underground services

All underground services should be routed outside of the TPZ. If underground services need to be installed within the TPZ, they must be installed using tree sensitive excavation methods under the supervision of the project arborist. Alternatively, boring methods such as horizontal directional drilling (HDD) may be used for underground service installation, providing the installation is at a minimum depth of 800mm below grade. Excavations for entry/exit pits must be located outside the TPZ.

Site Inspections

In accordance with the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, inspections must be conducted by the project arborist at the following key project stages:

- Prior to any work commencing on-site (including demolition, earthworks, or site clearing) and following the installation of tree protection.
- During any excavations, building works and any other activities carried out within the TPZ of any tree to be retained & protected.
- A minimum of every month during the construction phase from commencement to issue of the occupation certificate.
- Following the completion of the building works.

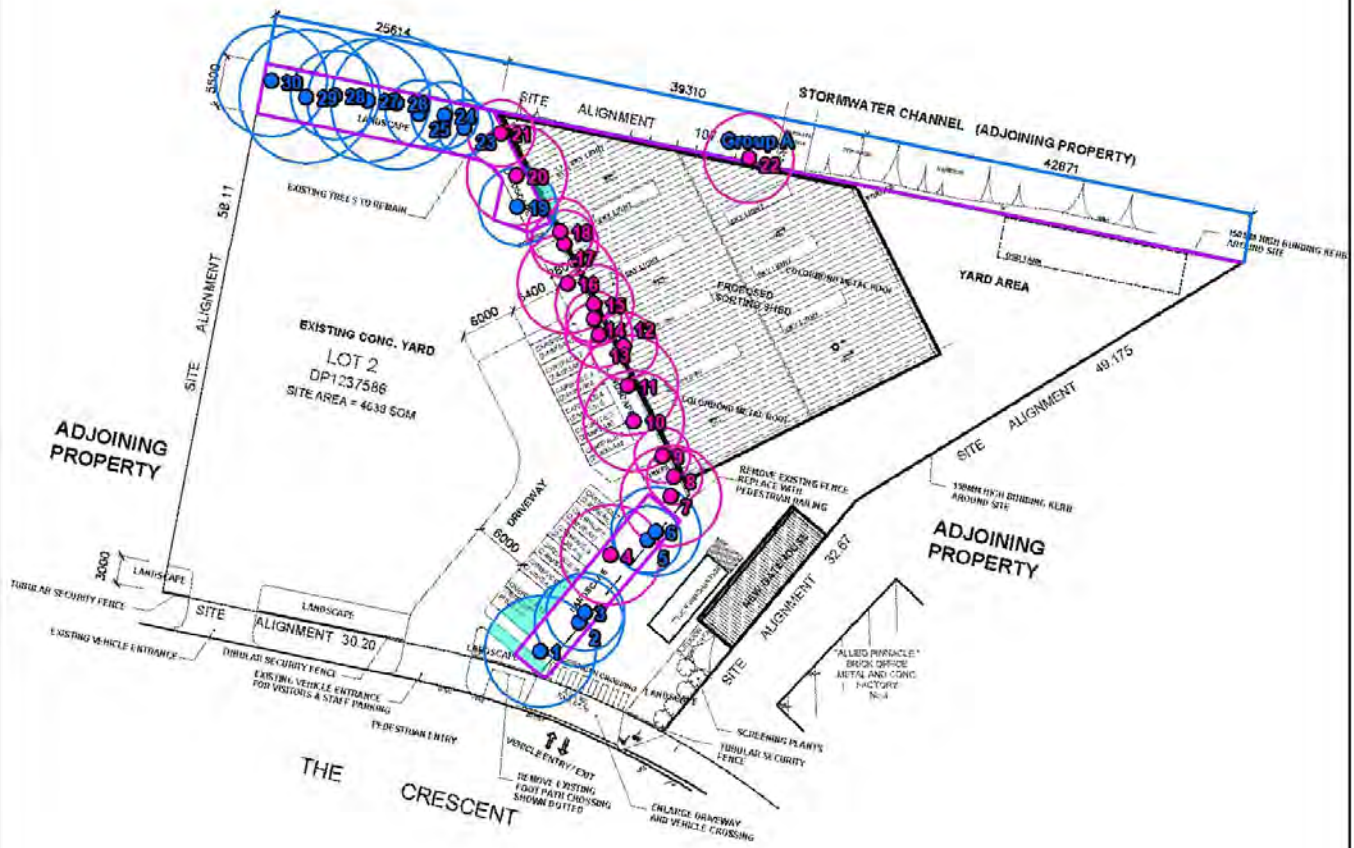
It shall be the responsibility of the project manager to notify the project arborist prior to any works within the TPZ of any protected tree at a minimum of 48 hours' notice. To ensure the tree protection plan is implemented, hold points have been specified in the schedule of work (**Table 1**).

Table 1: Schedule of work

Construction stage	Hold point	Description
Pre-construction	1	Prior to demolition and/or site establishment, indicate clearly (with spray paint on trunks) trees marked for removal only.
	2	Tree protection (for trees that will be retained) shall be installed prior to demolition and site establishment. This may include the mulching of areas within the TPZ. Project arborist shall inspect and certify tree protection.
During Construction	3	Scheduled inspection of trees by the project arborist should be undertaken monthly during the construction period.
	4	Project arborist to supervise and document all works carried out within the TPZ of trees to be retained.
	5	Inspection of trees by project arborist after all major construction has ceased, following the removal of tree protection measures.
Post Construction	6	Final inspection of trees by project arborist.

Appendix III **- Tree protection map**

Tree Protection Map



Legend

The subject trees
- Retain
- Remove

Protection zones
- TPZ (continuous line)
- SRZ (dashed line)

Protection measures
- Arborist supervision
- Tree protection fencing

0 5 10 20 Meters

N

TREE SURVEY
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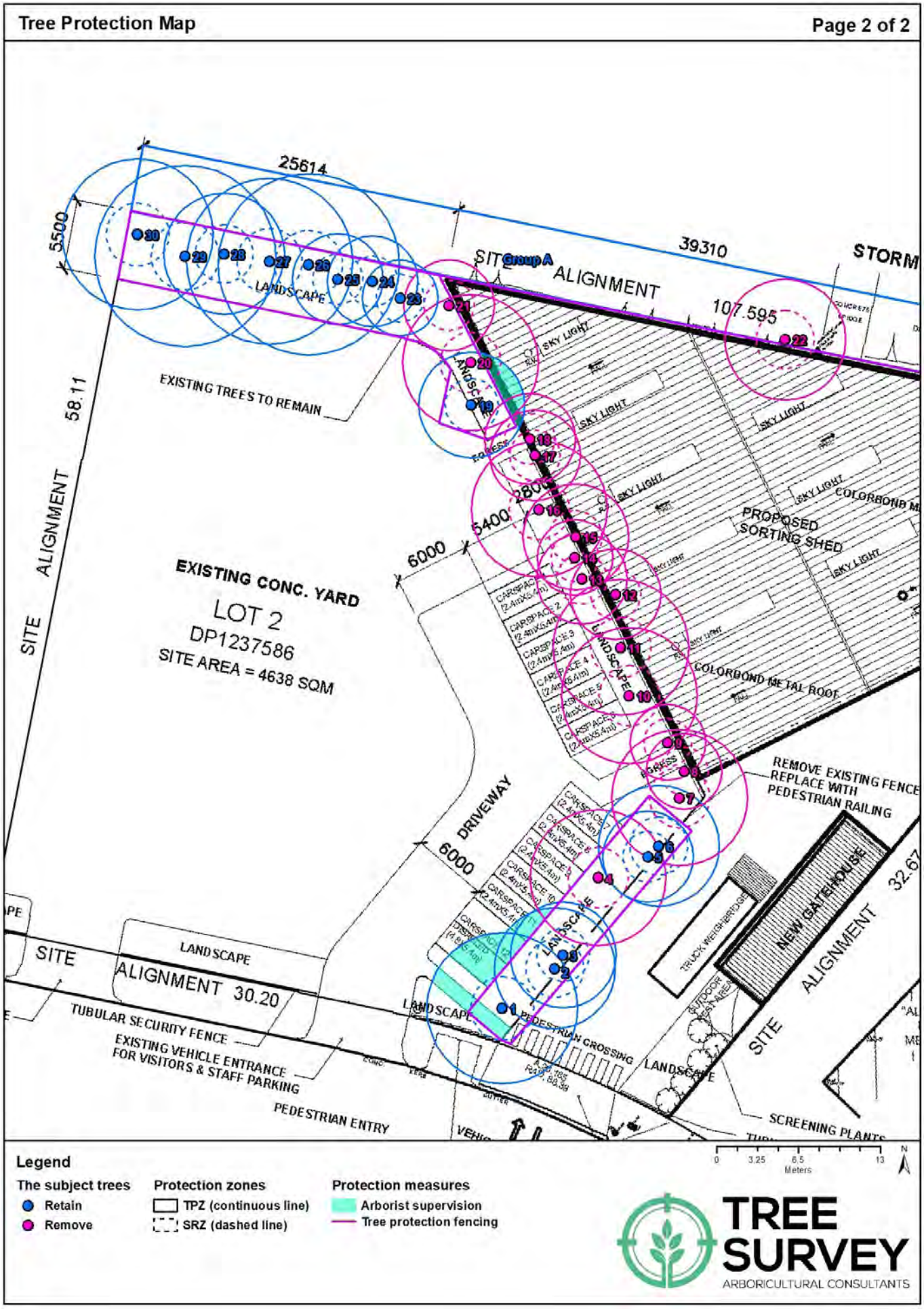
Tree Protection Map
Page 2 of 2
25614
39310
5500
58.11
SITE ALIGNMENT
SITE Group A ALIGNMENT
107.595
STORM
LANDSCAPE
EXISTING TREES TO REMAIN
SKY LIGHT
FOREST
2800
5400
6000
EXISTING CONC. YARD
LOT 2
DP1237586
SITE AREA = 4638 SQM
PROPOSED SORTING SHED
COLORBOND METAL ROOF
DRIVEWAY
REMOVE EXISTING FENCE
REPLACE WITH
PEDESTRIAN RAILING
NEW GATEHOUSE
TRUCK WEIGHBRIDGE
OUTDOOR STAFF AREA
32.67
SITE ALIGNMENT 30.20
TUBULAR SECURITY FENCE
EXISTING VEHICLE ENTRANCE
FOR VISITORS & STAFF PARKING
PEDESTRIAN ENTRY
PEDESTRIAN CROSSING
SCREENING PLANTS
Legend
The subject trees
Retain
Remove
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Protection measures
Arborist supervision
Tree protection fencing
0 3.25 6.5 13
Meters
N
TREE SURVEY
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Appendix IV **- STARS© assessment matrix**

Tree Significance - Assessment Criteria

Low	Medium	High
The tree is in fair-poor condition and good or low vigour. The tree has form atypical of the species The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms The tree has a wound or defect that has the potential to become structurally unsound. The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties. The tree is a declared noxious weed by legislation	The tree is in fair to good condition The tree has form typical or atypical of the species The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street The tree provides a fair contribution to the visual character and amenity of the local area The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ	The tree is in good condition and good vigour The tree has a form typical for the species The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age. The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on council's significant tree register The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity. The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group, or has commemorative values. The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.

Useful Life Expectancy - Assessment Criteria			
Remove	**Short**	**Medium**	**Long**
Trees with a high level of risk that would need removing within the next 5 years. Dead trees. Trees that should be removed within the next 5 years. Dying or suppressed or declining trees through disease or inhospitable conditions. Dangerous trees through instability or recent loss of adjacent trees. Dangerous trees through structural defects, including cavities, decay, included bark, wounds, or poor form. Damaged trees that considered unsafe to retain. Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. Trees that will become dangerous after removal of other trees for the reasons.	Trees that appear to be retainable with an acceptable level of risk for 5-15 years. Trees that may only live between 5 and 15 more years. Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals. Trees that may live for more than 15 years but would be removed during the course of normal management for safety or nuisance reasons. Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.	Trees that appear to be retainable with an acceptable level of risk for 15-40 years. Trees that may only live between 15 and 40 more years. Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals. Trees that may live for more than 40 years but would be removed during the course of normal management for safety or nuisance reasons. Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.	Trees that appear to be retainable with an acceptable level of risk for more than 40 years. Structurally sound trees located in positions that can accommodate future growth. Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery. Trees of special significance for historical, commemorative, or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

Useful Life Expectancy	Tree Significance					
		High	**Medium**	**Low**		
	Long >40 years					
	Medium 15-40 years					
	Short <1-15 years					
	Dead					

Legend for Matrix Assessment

	Priority for retention (High): These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.
	Consider for retention (Medium): These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with the removal considered only if adversely affecting the proposed building/works, and all other alternatives have been considered and exhausted.
	Consider for removal (Low): These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Consider for removal (Low): These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Reference

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS)
Institute of Australian Consulting Arboriculturists
Australia, www.iaca.org.au