

77 - 91 Warnervale Road, Warnervale NSW

Biodiversity Management Plan

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Final



Report No. 21169RP3

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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Glossary

Term/Abbreviation	Definition
AEP	Anderson Environment and Planning
Agreement	The Biodiversity Certification Agreement for the Subject Land
All Zones	Both Management Zone 1 and Management Zone 2 as defined in Chapter 4
Avoided Land	As defined in the Agreement
BAM	Biodiversity Assessment Method
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BCAR	Biodiversity Certification Assessment Report
BCD	Biodiversity Conservation Division of the DPE
Biosecurity Act	NSW <i>Biosecurity Act 2015</i>
BMP	Biodiversity Management Plan
BMP Area	Area to be managed under this BMP
BRC	Bushland Regeneration Contractor
Certified Land	As defined in the Agreement
Client	Vale Nominee Pty Ltd
Council	Central Coast Council
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
EHG	NSW Environment and Heritage Group
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
ha	Hectares
Landowner	As defined in the Agreement
NSW	New South Wales
PCT	Plant Community Type
Subject Land	77-91 Warnervale Road, Warnervale NSW
TEC	Threatened Ecological Community
TPZ	Tree Protection Zone
WoNS	Weed of National Significance

1. Introduction

This Biodiversity Management Plan (BMP) has been prepared for land located at 77-91 Warnervale Road, Warnervale New South Wales (NSW) (the 'Subject Land'). It has been prepared in accordance with the Biodiversity Certification Agreement (the 'Agreement') issued by the NSW Department of Planning and Environment (DPE) for the Subject Land to guide the management and conservation of the retained wildlife corridor (the 'BMP Area') and maintain it in perpetuity as a high-quality wildlife corridor for threatened species. This BMP also includes measures for the protection of biodiversity during the Development Phase in relation to both the Certified Land and Avoided Land (as defined in the Agreement), as shown in **Figure 1**.

1.1. Background

1.1.1. Location and Description of the Subject Land

The Subject Land is approximately 5.17 hectares (ha) in area and currently comprises an existing residential dwelling, a shed, dam, paddocks and treed and grassland vegetation, as shown in **Figure 2**. The Subject Land is located within the Central Coast Local Government Area and is bound by Warnervale Road to the north, Porters Creek Public School to the west, an AV Jennings residential development site to the south (under construction), and an existing rural residential property to the east.

The native vegetation of the Subject Land is part of a larger patch of retained vegetation in the locality (5 km buffer around the Subject Land), with connectivity to the west through the Porters Creek Public School corridor to other rural-residential properties, and to south and west through the AV Jennings site which links to a large area of bushland on the western side of the train line and Railway Road. Warnervale Oval lies directly to the north of the Subject Land, providing partial connectivity to bushland surrounding the Oval, and a large patch of native vegetation occurs directly east of the Subject Land, on the eastern side of Virginia Road (**Figure 2**).

1.1.2. Definition and Location of the BMP Area

The BMP Area, which will be protected as a conservation lot in perpetuity, comprises the retained 50 m wide wildlife corridor at the south of the Subject Land (see **Figure 2**). This BMP also considers the biodiversity management within the areas of residential development in the Subject Land during the Development Phase.

The BMP Area adds to the existing 50 m of native vegetation retained by the AV Jennings site directly to the south and will create a combined corridor of 100 m width which will also link to the 66 m corridor to the west retained by the Porters Creek Public School. Although the area of habitat to be retained by all three corridors in the vicinity of the BMP Area is much larger, the actions specified to be implemented by this BMP are limited to the vegetation within the BMP Area that will remain in the ownership of Vale Nominee Pty Ltd (the 'client'). The approved overall layout of the development and the 50 m wildlife corridor (i.e. the BMP Area) is shown in **Figure 3**. For the purposes of this BMP, the BMP Area has the same definition as the Avoided Land (as defined in the Agreement). Additionally, the Development Site Footprint has the same definition as the Certified Land (as defined in the Agreement) (see **Figure 1**).

1.2. Purpose

The purpose of this BMP is to specify measures that will be implemented in the Subject Land and, in relation to the BMP Area, to protect and enhance this area for biodiversity in perpetuity. In particular, Clause 5.1(c) of the Agreement requires the preparation of a BMP to apply to the Certified Land during the Development Phase

and the Avoided Land in perpetuity (as defined in the Agreement). The Agreement requires the BMP to include matters referred to in Section 8.5 of the Biodiversity Certification Assessment Report (BCAR) prepared by Cumberland Ecology (2022), unless otherwise agreed with the DPE. Section 8.5 of the BCAR provides that the BMP include the following:

- An overview of the existing environment of the BMP Area;
- Details of the biodiversity management measures to be implemented;
- Details of the monitoring program to be undertaken;
- Details of the reporting requirements; and
- Details of the performance criteria for the biodiversity management measures.

The Agreement includes in Clause 5.7 reporting requirements of the Landowner. These require an annual report for each period of 12 months from the Effective Date for 5 years after the date of the Agreement (i.e. 10 February 2028) or development completion, whichever is the latter. The report must be submitted within 60 days of the end of each reporting period. As the Agreement will cease to apply to the Certified Land in the Occupation Phase, any reporting requirements in relation to the Certified land will cease in the Occupation Phase.

The primary objective of this BMP is to comply with the obligations under the Agreement. The vegetation within the BMP Area currently consists of predominantly canopy trees over a modified understorey and actions included in this BMP include re-planting of the shrub and ground cover layer as well as canopy trees in existing gaps. Other actions to be implemented according to the details in this BMP include clearing protocols, weed control, hollow salvage from the trees to be removed, installation of nest boxes and monitoring. During the Development Phase, the measures specified in this BMP will be implemented for the five-year period from the date of the Agreement, or until development completion, whichever occurs later unless otherwise agreed with the Biodiversity and Conservation Division (BCD) of the DPE. In relation to the Avoided Land, the relevant provisions of the Agreement apply in perpetuity as noted in Section 8.4 below, or as otherwise agreed with the Minister administering the BC Act, or the Minister's delegate.

Measures to be implemented according to this BMP are provided in Chapter 8 of the BCAR, and include the following:

- Biodiversity management measures in the Certified Land during clearing in the Development Phase (**Chapter 5 and 8**);
- Weed management measures to enhance the biodiversity values of the Subject Land (**Chapter 6**);
- Limited reinforcement of the vegetation in the BMP Area where required with native vegetation that is representative of the original plant community (**Chapter 7**);
- Provide for the enhancement and protection of the habitat values of the BMP Area by facilitating reconstruction and preventing intrusions (**Chapter 5, 7 and 8**); and

- Provide for ongoing monitoring to maintain the ecological values of the BMP Area in the long-term including nest box monitoring (**Chapter 8**).

The BMP will be managed in a series of phases as follows:

- Phase 1 – Site establishment and construction of proposed development;
- Phase 2 – Revegetation and weeding;
- Phase 3 – Maintenance; and
- Phase 4 – Monitoring and reporting.

2. Methodology

2.1. Literature Review

The preparation of this BMP involved a literature review that included review of previously prepared ecological reports, government mapping and guidelines for the preparation of vegetation management plans. The literature review also identified the most up to date methods of weed control for exotic species that are present in the Subject Land and included a review of government fact sheets and websites. Cumberland Ecology staff with expertise in bushland regeneration were also consulted on current best practice methods and techniques. The literature review included, but was not limited to review of the following documents;

- 77-91 Warnervale Road, Warnervale: Biodiversity Certification Assessment Report (Cumberland Ecology 2022);
- Conservation Management Plan – Precinct 7A, Warnervale and Hamlyn Terrace NSW (Umwelt 2014);
- Warnervale Road Warnervale Study Area: Ecological Assessment (Umwelt 2017);
- Ecological Assessment Report for Proposed Subdivision of Lot 72 DP7091 77 – 91 Warnervale Road Warnervale (Anderson Environment & Planning 2016);
- NSW Environment and Heritage Group (EHG) BioNet Atlas (EHG 2023a);
- NSW EHG BioNet Vegetation Classification Database (EHG 2023b);
- The Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (DCCEE 2023a), and the EPBC Act Species Protection and Threats Profile Database (DCCEE 2023b); and
- The Biodiversity Certification Agreement prepared by DPE for the Subject Land.

2.2. Field Surveys

Anderson Environment and Planning (AEP) previously conducted field surveys within the Subject Land between 12 October 2015 and 2 March 2016, comprising flora surveys, habitat assessment, and targeted fauna surveys involving trapping, bat call recording and spotlighting. As part of the preparation of the BCAR, Cumberland Ecology conducted field surveys within the Subject Land on 25 June 2021 and between 9 – 13 August 2021, 1 – 10 November 2021 and 16 – 29 December 2021. These were completed to ensure that the most up to date information was available for impact assessment purposes. Surveys included vegetation mapping, plot-based vegetation surveys in accordance with the Biodiversity Assessment Method (BAM), a habitat assessment, diurnal bird surveys, nocturnal spotlighting and call playback, baited infra-red cameras, Spot Assessment Technique (Phillips and Callaghan 2011) surveys, Elliot, pitfall and harp trapping, ultrasonic call detection, and roost watches.

3. Existing Biodiversity Values

3.1. Vegetation Communities

The Subject Land consists predominantly of scattered remnant canopy trees over a modified understorey, which forms part of a larger patch of vegetation that extends outside of the Subject Land to the west and south.

The BCAR prepared by Cumberland Ecology (2022) identified one Plant Community Type (PCT) within the Subject Land:

- PCT 1619 Smooth-barked Apple – Red Bloodwood – Brown Stringybark – Hairpin Banksia heathy open forest of coastal lowlands (total ~2.52 ha, 1.72 ha clearing, 0.80 ha retention in BMP Area).

In addition to PCT 1619, approximately 0.02 ha of planted native vegetation occurs within the Subject Land. The remaining vegetation within the Subject Land comprises exotic vegetation and cleared areas totalling an area of approximately 2.63 ha, which include the dam and existing dwellings.

A detailed description of this PCT is provided below and the distribution of this PCT and other vegetation types within the Subject Land is shown in **Figure 4**.

3.1.1. Smooth-barked Apple – Red Bloodwood – Brown Stringybark – Hairpin Banksia heathy open forest of coastal lowlands

PCT Name: Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands

Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation)

Vegetation Class: Sydney Coastal Dry Sclerophyll Forests

Percent Cleared Value: 45%

3.1.1.1. Condition States

The occurrence of PCT 1619 in the Subject Land includes all of the native vegetation within the Subject Land and occurs in four broad condition states:

- Good (shrubs intact) condition;
- Good (shrubs removed) condition;
- Moderate condition; and
- Low condition.

Each of these condition states are described below.

i. Good (shrubs intact) Condition

This community occurs as a large strip of vegetation along the southern boundary that makes up the area primarily proposed to be retained as the 50 m wildlife corridor.

The canopy is dominated by *Eucalyptus capitellata* (Brown Stringybark) and *Corymbia gummifera* (Red Bloodwood), with *Angophora costata* (Smooth-barked Apple) and *Allocasuarina littoralis* (Black She-oak) occurring less commonly.

The native shrub layer includes *Melaleuca nodosa*, *Melaleuca sieberi*, *Phyllanthus hirtellus* (Thyme Spurge), and *Lambertia formosa* (Mountain Devil). Additional, though less prevalent, species include *Pimelea linifolia* subsp. *linifolia*, *Pittosporum undulatum* (Sweet Pittosporum), *Acacia suaveolens* (Sweet Wattle), *Hibbertia empetrifolia* subsp. *empetrifolia*, and *Leptospermum trinervium* (Slender Tea-tree).

The ground layer comprises an abundance of native species, with only a relatively low cover of exotics. The patch is dominated by *Schoenus apogon* (Fluke Bogrush), with *Cyathochaeta diandra*, *Austrostipa pubescens*, *Microlaena stipoides* subsp. *stipoides* and *Ptilothrix deusta* frequently appearing. Exotic species include *Axonopus fissifolius* (Narrow-leaved Carpet Grass), *Andropogon virginicus* (Whiskey Grass), *Hypochoeris radicata* (Catsear), and *Setaria parviflora*.

An example of this community within the Subject Land is shown in **Photograph 1**.

Photograph 1 PCT 1619 in good (shrubs intact) condition within the southern portion of the Subject Land (in the BMP Area)



ii. Good (shrubs removed) Condition

This community occurs as a patch within the north-eastern corner of the Subject Land. This patch of the PCT in the north is slightly more elevated and drier than the patch in the south, and has undergone a history of grazing as part of the general property rural-residential use.

The canopy is dominated by *Eucalyptus capitellata* (Brown Stringybark) and *Corymbia gummifera* (Red Bloodwood), with *Angophora costata* (Smooth-barked Apple) and *Allocasuarina littoralis* (Black She-oak) occurring less commonly. The native *Glochidion ferdinandi* (Cheese Tree) and the exotic tree *Cinnamomum camphora* (Camphor Laurel) occur within this vegetation condition state.

The native shrub layer is somewhat reduced due to grazing by horses and prior agricultural use. However, it retains a diversity of species that includes *Pimelea linifolia* subsp. *linifolia*, *Pittosporum undulatum* (Sweet Pittosporum), *Acacia suaveolens* (Sweet Wattle), *Hibbertia empetrifolia* subsp. *empetrifolia*, and *Leptospermum trinervium* (Slender Tea-tree).

The ground layer comprises an abundance of native species, with only a relatively low cover of exotics. This includes the natives *Cyathochaeta diandra* and *Microlaena stipoides* subsp. *stipoides* (Weeping Grass), with *Austrostipa pubescens*, *Anisopogon avenaceus* (Oat Speargrass), and *Lepidosperma neesii* also common throughout.

An example of this community within the Subject Land is shown in **Photograph 2**.

Photograph 2 PCT 1619 in good (shrubs removed) condition within the northern patch of the Subject Land



iii. Moderate Condition

This condition state of the community consists of two patches within the Subject Land where the canopy is mostly intact, however the shrub layer has been generally removed and the ground layer is degraded through historical and current agricultural use and is now predominantly exotic species; nevertheless, a few natives persist.

The canopy is dominated by mature *Eucalyptus capitellata*, *Corymbia gummiifera*, and *Angophora costata*, with several *Glochidion ferdinandi* present.

The shrub layer is sparse and includes only a few scattered *Acacia longifolia* subsp. *longifolia* (Sydney Golden Wattle), *Pimelea linifolia* subsp. *linifolia*, and *Pittosporum undulatum*.

Exotics that dominate the ground layer include *Cenchrus clandestinus* (Kikuyu) and *Axonopus fissifolius*, along with lesser coverage of species such as *Juncus cognatus*, *Paspalum dilatatum* (Paspalum), *Setaria parviflora*, and *Senecio madagascariensis* (Fireweed). Native species include *Cynodon dactylon* (Common Couch) (likely part of

the agricultural planted pasture grasses), *Imperata cylindrica* (Blady Grass), *Microlaena stipoides subsp. stipoides*, and the fern *Pteridium esculentum* (Bracken).

An example of this community within the Subject Land is shown in **Photograph 3**.

Photograph 3 PCT 1619 in moderate condition within the Subject Land



iv. Low Condition

This condition state of the community comprises scattered paddock canopy trees throughout a degraded ground layer resulting from historical and current agricultural use.

The canopy includes mature *Eucalyptus capitellata*, *Corymbia gummifera*, and *Angophora costata*. There is no shrub layer currently remaining. Several *Corymbia maculata* are present in the north-western most patch indicating a historical transitional area with the Narrabeen Buttonderry Footslopes Community (PCT 1590) which commonly intergrades with PCT 1619 in the Warnervale area as described by Bell (2002).

The ground layer comprises the prevalent exotics *Axonopus fissifolius*, *Cenchrus clandestinus*, and *Lolium perenne* (Perennial Ryegrass), along occurrences of other exotics such as *Juncus cognatus*, *Trifolium repens* (White Clover), *Lotus uliginosus* (Birds-foot Trefoil), and *Bromus catharticus* (Prairie Grass). While there is limited

native cover in the ground layer, *Cynodon dactylon*, *Microlaena stipoides* subsp. *stipoides*, *Lythrum hyssopifolia* (Hyssop Loosestrife), *Lobelia purpurascens* (Whiteroot), and *Hydrocotyle laxiflora* (Stinking Pennywort) are examples of the species that appear.

An example of this community within the Subject Land is shown in **Photograph 4**.

Photograph 4 PCT 1619 in low condition within the Subject Land



3.1.1.2. Alignment with Threatened Ecological Communities

Within the BioNet Vegetation Classification, this PCT is not associated with any Threatened Ecological Communities (TECs) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) or the EPBC Act.

3.1.2. Other Vegetation Types

3.1.2.1. Planted Natives

This community comprises a few planted native trees, interspersed by exotics, used for landscaping purposes around the main residential dwelling. This includes a couple of large, planted *Banksia integrifolia* (Coast Banksia), a *Callistemon salignus* (Willow Bottlebrush) and a *Callistemon viminalis* (Weeping Bottlebrush). This community does not meet the requirements to be allocated to a PCT as per Appendix D of the BAM and does

not conform to a TEC under the BC Act and/or EPBC Act. It has been assessed against the streamlined assessment module for planted native vegetation as described in Section 4.6 of the BCAR.

An example of Planted Natives is shown as **Photograph 5**.

Photograph 5 Planted natives within the Subject Land



3.1.2.2. Exotics/Cleared Land

Other vegetation within the site consists of areas dominated by exotic species, comprising both plantings of trees and shrubs, and exotic pasture areas. Trees occurring include *Liquidambar styraciflua* (American Sweetgum), *Fraxinus* sp. and *Jacaranda mimosifolia* (Jacaranda). Shrub species include *Murraya paniculata* (Orange Jessamine). Exotic grass species present include *Axonopus fissifolius*, *Paspalum dilatatum*, *Juncus cognatus*, *Senecio madagascariensis*, and *Cenchrus clandestinus*.

Exotic vegetation does not require allocation to a PCT.

Examples of exotic vegetation are shown in **Photograph 6** and **Photograph 7**.

Photograph 6 Exotic grassland within the Subject Land



Photograph 7 Exotic planted trees within the Subject Land



3.2. Flora Species

A wide diversity of flora species has been recorded within the Subject Land during field surveys conducted by both AEP and Cumberland Ecology, the majority of which are native. That notwithstanding, the floral assemblage across the Subject Land reflects the previous and current land uses which have resulted in a disturbed landscape.

One threatened flora species has been recorded from the Subject Land, *Callistemon linearifolius*. This species is listed as Vulnerable under the BC Act and was recorded as three individual plants. All three individuals were recorded within the BMP Area (**Figure 5**).

Several exotic flora species have been recorded within the Subject Land, including several weeds which are listed as Other Weeds of Regional Concern and one weed listed as a State Priority Weed within the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2021). One Weed of National Significance (WoNS) has been recorded within the Subject Land. **Appendix A** lists the exotic species recorded in the Subject Land.

3.3. Fauna Species

The vegetation within the Subject Land provides potential, albeit sub-optimal habitat for a range of fauna species. However, due to understorey clearing across the majority of the Subject Land, the habitat within the Subject Land is not considered to be of high faunal value for most species and would provide limited foraging habitat for mostly urban adapted bird species. Habitat resources present in the Subject Land includes tree hollows and mature vegetation suitable for use as foraging habitat by a range of fauna species, as well as a farm dam providing foraging habitat for wetland birds and amphibians. **Figure 6** shows the location of habitat features within the Subject Land.

Due to the presence of suitable habitat, the BCAR (Cumberland Ecology 2022) considered that numerous threatened fauna species had potential to utilise the Subject Land. During the field surveys, four threatened species were recorded within the Subject Land, the Powerful Owl (*Ninox strenua*), the Little Bent-winged Bat (*Miniopterus australis*), the Large Bent-winged Bat (*Miniopterus orianae oceanensis*) and the Southern Myotis (*Myotis macropus*). All of these species are listed as Vulnerable under the BC Act.

The Powerful Owl was recorded from the Subject Land during nocturnal spotlighting and call playback surveys in August 2021. No roosting habitat for this species was recorded on the Subject Land, as such, the Powerful Owl is likely to only use the Subject Land for foraging purposes.

The Little Bent-winged Bat and Large Bent-winged Bat were both assumed as present within the Subject Land as they are dual credit species and their respective habitat constraints were not present within, or in close proximity to, the Subject Land. As such, these species were assessed as ecosystem credit species for foraging habitat only.

The Southern Myotis was likely recorded within the Subject Land on two ultrasonic detection devices deployed in December 2021. Considering the proximity of the microbat calls to the on-site dam, it was considered highly

likely that the microbat calls recorded were from the Southern Myotis. Hollow-bearing trees also occur in close proximity to the dam, providing suitable roosting habitat for this species.

Additionally, the Squirrel Glider (*Petaurus norfolcensis*) was assumed as present in the Subject Land to address Central Coast Council (Council) and DPE comments, despite no individuals being recorded during the Cumberland Ecology surveys in 2021, or the AEP surveys in 2016. A number of hollow-bearing trees occur within the Subject Land, and the native trees and shrubs present include preferred feed species for the Squirrel Glider, providing both suitable nesting and foraging habitat for this species.

4. Management Zones

4.1. Introduction

Under this BMP, the Avoided Land will be managed by the future landowners of the Avoided Land following development completion and will require weed management, monitoring, and the restoration and revegetation with native, endemic plant species. The BMP Area will be managed as two management zones, as shown in **Figure 7**. Management of the Avoided Land under this BMP is to be undertaken over a five-year period. It is noted that the relevant provisions of the Agreement apply in perpetuity to the Avoided Land as identified in Section 8.4 below, or as otherwise agreed with the Minister administering the BC Act, or the Minister's delegate.

4.2. Management Zone 1 – PCT 1619 Protected Vegetation Area

Management Zone 1 consists of 0.80 ha of intact PCT 1619 vegetation in good (shrubs intact) condition that occupies the majority of the BMP Area. This patch consists of a native canopy and shrub layer, and a mixed native and exotic ground layer.

4.2.1. Objectives

The objectives of this management zone are:

- Remove and control exotic weed species; and
- Limited infilling of gaps with native species.

4.2.2. Actions

As this vegetation community is in good condition it is expected that minor management actions are required. Initial actions within this management zone will be the removal of any exotic ground layer species present within the zone. **Appendix B** includes recommended weed control measures for exotic species previously recorded within the Subject Land. All of the existing native canopy, shrub and groundcover species will be retained.

After the clearance of exotic ground layer species has taken place, species characteristic of PCT 1619 may need to be planted, where gaps occur. Additionally, some areas of this management zone lack the appropriate cover of canopy species, particularly near the centre, and in the south-eastern corner of the management zone. These areas may require limited replanting of canopy species if natural regeneration from the surrounding vegetation does not occur. A species list for PCT 1619 is provided in **Appendix C**.

4.3. Management Zone 2 – PCT 1619 Regeneration Area

Management Zone 2 consists of ~50 m² of exotic/cleared land that occurs near the centre of the northern boundary of the BMP Area. This management zone consists mostly of exotic dominated grassland and a small portion a shed proposed to be demolished.

4.3.1. Objectives

The objectives of this management zone are:

- Demolition of existing structure, under ecologist supervision;
- Remove and control exotic weed species; and
- Revegetate areas with native canopy, shrub and groundcover species.

4.3.2. Actions

As this management zone currently contains exotic/cleared land, major management actions are required. Initial actions within this management zone will be the removal of the existing structure and any exotic shrub and groundcover species present. **Appendix B** includes recommended weed control measures for exotic species previously recorded within the Subject Land. The management zone will then be revegetated with species characteristic of PCT 1619 in all strata. A species list for PCT 1619 is provided in **Appendix C**.

5. Vegetation Clearing Plan

This chapter provides protocols for vegetation clearing and other site works associated with the residential development in the Certified Land, to avoid impacts to retained native vegetation in the BMP Area. Other specific BMP works such as weed control and revegetation are detailed in the later chapters.

5.1. Hygiene Protocols

To avoid the spread of Root Rot Fungus (*Phytophthora cinnamomi*) and other soil borne pathogens, appropriate hygiene procedures and guidelines described in *Best Practice Management Guidelines for Phytophthora cinnamomi within the Sydney Metropolitan Catchment Management Authority Area* (Botanic Gardens Trust 2008) will be followed.

This will involve all machinery, clothing (such as boots and gloves), and tools, which will have contact with soil to be disinfected with a spray prior to entering and leaving the BMP Area.

Recommended disinfectant products include:

- Non-corrosive disinfectants including Coolacide®, Phytoclean®, or Biogram® which can be for cleaning footwear, tools, tyres, machinery and other items in contact with soil;
- 70% Methylated spirits solution in a spray bottle which is suitable for personal use (clothing); and
- Sodium Hypochlorite 1%, which is effective, but can damage clothing and degrades rapidly in light.

5.2. Environmental Inductions

Inductions will be undertaken for all personnel who will work within the Subject Land prior to the commencement of any works to communicate environmental features to be protected and measures to be implemented. The induction will specify in detail which areas of vegetation are approved to be removed and the importance of not damaging retained vegetation. The induction will specify that unauthorised personnel are not permitted to enter retained vegetation areas, and that no machinery or stockpiling of materials is permitted within the BMP Area.

5.3. Protection of Retained Vegetation

5.3.1. BMP Area

Vegetation clearing is proposed to occur in the Subject Land immediately adjacent to the BMP Area, so appropriate measures will be implemented to protect retained native vegetation with this area.

Prior to clearing works commencing, the extent of clearing will be clearly marked by a 1.8m high temporary chain-link fence. To avoid unnecessary or inadvertent vegetation and habitat removal or impacts on fauna, disturbance must be restricted to the delineated area and no stockpiling of equipment, machinery, soil, rock or vegetation will occur beyond this boundary.

Following the completion of clearing works, a permanent fence will be erected where the temporary clearing boundary markers previously stood, except areas directly adjoining the bushland to the west and south of the adjoining properties. The areas directly adjoining the surrounding bushland must instead be identified with

bollards installed at intervals of no less than 1.5 m (**Figure 8**). A gate is to be included to allow access for future management, and signage is to be placed on the fence every 30 m which is to bear the words “Wildlife Corridor, no entry without landholder consent”. The BMP Area is to be protected through the Agreement being registered on the Title pursuant to the BC Act.

5.3.2. Subject Land

Prior to clearing works commencing, 2 m high temporary chain wire fencing is to be installed around the Tree Protection Zone (TPZ) of any trees proposed to be retained within the area to be cleared. No clearing of vegetation, storage of vehicles or machinery, stockpiling, materials storage, or unauthorised access is to occur within the TPZ of any retained trees.

5.4. Weed Management

Several weed species have been recorded from the BMP Area, and if left uncontrolled these may threaten the objectives of this area. In addition, disturbance during development works can create opportunities for weed invasion, and as such appropriate weed control activities will be undertaken during clearing. The amount of bare soil exposed at any one time will be minimised, and as outlined previously, sediment fencing will be installed along the boundary of any areas proposed to be cleared, and downslope of any activities involving earthworks to prevent the spread of weeds into the BMP Area from clearing works.

Prior to clearing, all plant equipment entering or exiting the Subject Land will be inspected and recommended for wash down (in designated wash down areas) as required to ensure weed material from off-site locations do not establish or spread into native vegetation within the BMP Area, or weed material present in the BMP Area do not establish in areas of native vegetation outside of the Subject Land. Any weed materials will need to be carefully removed off site in a manner appropriate to the species to prevent the spread of propagules to uncleared areas of native vegetation, both on and off site.

Of the exotic species recorded within the Subject Land, some are listed as Other Weeds of Regional Concern, and *Senecio madagascariensis* (Fireweed) is listed as a State Priority Weed within the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2021). These weeds are required to be controlled.

More detailed weed control measures for implementation in the BMP Area are presented in **Chapter 6**.

5.5. Habitat Clearing Protocols

Clearing in the Subject Land will be undertaken in accordance with the protocols outlined in this section. These have been developed in accordance with those presented in the Conservation Management Plan – Precinct 7A, Warnervale and Hamlyn Terrace NSW (Umwelt 2014).

Major clearing works are to be undertaken between March and August to facilitate survival of displaced fauna. Any microchiropteran bats, or other nocturnal fauna captured during the clearing process must be released after nightfall to minimise the risk of predation by diurnal predators and harassment by diurnal birds.

All measures will be taken to ensure the safe and secure relocation of fauna found during the clearing process, however, in the unlikely event that any animals are inadvertently injured, they will be taken to the nearest veterinary clinic for treatment, or if the animal is unlikely to survive transport to a clinic, it will be humanely euthanised.

5.5.1. Pre-clearance Surveys

Prior to vegetation clearance, any trees that require removal will be inspected for hollows, nests and other habitat features prior to removal through a pre-clearance survey by a qualified ecologist. Pre-clearing surveys will include demarcation of key habitat features as hollow-bearing trees, fallen logs and bush rock generally within two weeks of the proposed clearing activities. Any hollow logs, tree hollows or bush rock that would be suitable for salvage as habitat features will also be identified and marked during this survey.

5.5.2. Clearing of Non-Habitat Trees

Immediately prior to tree-felling commencing, a visual canopy inspection will be undertaken by a suitably qualified ecologist, paying particular attention to the presence of threatened birds, Grey-headed Flying-foxes and Koalas. If no threatened species are observed, non-habitat trees can then be cleared. Cleared vegetation is then to be left undisturbed overnight to allow any remaining fauna to vacate the area.

If threatened birds are observed nesting in a non-habitat tree, the felling of the tree must be suspended for a period determined by the ecologist to allow for nestlings to fledge. If non-threatened birds are observed, efforts are to be made to reduce the impact of tree-felling on these species. Any orphaned young are to be handled and transported to the nearest veterinary clinic as per the procedure in **Section 5.6**.

If other threatened fauna are observed in the canopy, the tree is to be left overnight and another visual canopy inspection is to be undertaken the next day. If the threatened animal remains in the canopy, it is to be captured and removed by a licensed and experienced wildlife handler.

5.5.3. Clearing of Habitat Trees

5.5.3.1. Day Prior to Felling of Habitat Trees

The actions outlined below only need to be implemented if clearing of non-habitat trees has not occurred the day prior to the felling of habitat trees:

- A visual canopy inspection will be undertaken by a suitably qualified ecologist, with particular attention paid to the presence of non-hollow dependent threatened species such as nesting birds, the Grey-headed Flying-fox and the Koala. In the event that threatened nesting birds are observed, the felling of that tree is to be suspended for a period determined by the ecologist to allow nestlings to fledge. If other threatened fauna is observed, the quality of the habitat tree is to be reduced by removing branches and/or daily tapping/shaking of the tree;
- All habitat trees are to be tapped/shaken the day prior to felling, with the use of heavy machinery;

- If hollow-dependent fauna are identified, actions to reduce the quality of the habitat tree will be undertaken. This may include further tapping/shaking of the tree and/or removal of branches away from the hollow to discourage use; and
- If there is strong indication that breeding of a threatened species is occurring, advice from an ecologist will be sought to advise on the actions to be taken. The type of actions will depend on the ecological significance and sensitivity of the species. Actions may include using techniques to verify the breeding activity, actions to discourage fauna if breeding is not verified, or in unusual cases the cessation of clearing until the animal's breeding has completed.

5.5.3.2. Day of Felling Habitat Trees

The following will occur on the day of habitat tree felling:

- All habitat trees will be subject to a visual inspection by a suitably qualified ecologist, to survey for nonhollow- dependent threatened species. If such are identified, relevant actions required may include shaking the tree to encourage the animal to move on, or (as a last resort) the animal be captured and removed by a licensed and experienced wildlife handler;
- Trees with no records of occupancy from previous shaking should be shaken again and felled if no fauna emerge;
- In all cases (except for trees with fauna present), hollow-bearing trees will be slowly pushed over (where safe and practical to do so) with the use of a bulldozer or excavator;
- Trees marked for hollow salvage, or with persistent fauna present, will be sectionally dismantled, and for large sections, a crane used to lower sections. A person qualified to work at heights will be utilised for this work to assist with safely transporting these features to the ground;
- Trees previously identified as containing non-threatened birds will be shaken and then felled, provided no threatened species are identified. All reasonable attempts will be made to reduce the impact of felling on non-threatened species. Orphaned young will be taken to wildlife carers;
- If a threatened species is identified in a hollow on the day of felling, the supervising ecologist will advise on the most appropriate method to minimise potential harm. This may include leaving the tree overnight, further shaking to encourage the animal to vacate the tree, removal of branches away from the hollow to discourage ongoing use, or measures to capture and relocate the animal to secure habitats;
- Where a habitat tree is known to contain a threatened species, all reasonable measures to minimise potential impact will be carried out, prior to felling the tree. This may include the options outlined above;
- Captured, uninjured animals will be released on the day of capture in nearby suitable secure habitat and will not be held for extended periods of time. These should be released near installed nest boxes where possible; and

- Captured, injured animals will be taken to the nearest veterinary clinic or wildlife carer for assessment and treatment. Animals will be released in a suitable secure habitat in the BMP Area, near to their original location.

5.5.3.3. After Felling Habitat Trees

The following will be undertaken after trees are felled:

- Following felling, habitat trees will be inspected for remaining or injured fauna species and to ensure that no hollows are blocked against the ground. If hollows are blocked, the tree may be rolled (where safe and practical) to ensure that any fauna remaining in hollows are able to escape. Any captured, uninjured fauna will be relocated to the BMP Area. Any injured fauna will be captured, appropriately housed and transported to a wildlife carer without delay;
- All felled habitat trees will remain in place for one night to allow any fauna still in hollows to move on; and
- Felled habitat trees will be inspected for hollows, cracks and crevices suitable for salvage and installation in the BMP Area.

5.5.4. Clearing of Other Habitat Features

Other habitat features that are not trees, such as logs and bushrock, are to be cleared using a two-stage clearing process. The first stage involves clearing around identified habitat features and leaving the features for a 24-hour period. The second stage will involve clearing of the habitat feature under ecologist supervision. This will involve the ecologist initially inspecting the habitat feature for the presence of fauna immediately prior to the removal of the habitat feature. Any fauna present during the clearing process will be relocated into the BMP Area, or taken to the nearest veterinary clinic if injured.

5.5.5. Clearing of Structures

There is potential for microchiropteran bats and birds to roost within the sheds and dwelling, therefore a suitably qualified ecologist must be present to oversee the demolition of these structures and removal of the concrete slabs.

5.5.6. Dam Dewatering

A suitably qualified ecologist must be present throughout the dam dewatering process to catch and relocate any aquatic or terrestrial species present. All native species will be relocated to a nearby suitable waterbody and any exotic species will be humanely euthanised. The ecologist should also be present while an excavator strips the sediment out of the dam to a depth of approximately 0.5 m to relocate any sub-terranean species.

Due to the risk of spreading Chytridiomycosis (infection of frogs by amphibian chytrid) to frogs that may be occurring within the existing dam, ecologists that are involved in relocating fauna during the dam dewatering process will be required to follow the procedures outlined in the *Hygiene Protocol for the Control of Disease in Frogs* (DECC (NSW) 2008).

A brief letter report will be provided on completion of these works detailing the total number and species of individuals recorded and details of their release/health.

5.6. Veterinary Hospitals

The contact details for veterinary hospitals in proximity to the Subject Land are provided below. These are to be contacted prior to the commencement of felling habitat trees.

- Kanwal Veterinary Hospital. 5/2 Wiowera Road, Kanwal NSW 2259 (4.5 km from site – 7 min drive). Telephone: (02) 4392 2088. Hours: Mon-Fri 8:30am – 6pm, Sat-Sun 9am – 12pm.
- Coast and Valleys Veterinary Hospital. 138 Hue Hue Road, Alison NSW 2259 (9.7 km from site – 10 min drive). Telephone: (02) 4355 4704. Hours: Mon-Fri 8:30am – 6pm, Sat-Sun 9am – 6pm.
- Doyalson Animal Hospital. 423 Scenic Drive, Doyalson NSW 2262 (10.7 km from site – 14 min drive). Telephone: (02) 4399 2129. Hours: Mon-Fri 8:30am – 6:30pm, Sat 8:30am – 5:30pm, Sun Closed.

5.7. Salvage of Habitat Items

Where present, fauna habitat features including hollow-bearing trees, hollow-bearing logs, other woody material and bushrock will be salvaged from the development footprint during clearing and stockpiled for future use in restoration of the BMP Area. The placement of salvaged items in the BMP area will increase habitat complexity as such items are used by a variety of invertebrate and vertebrate species as microhabitat. Furthermore, the re-use of large hollows has been demonstrated to provide higher potential for uptake success by comparison to artificial nest boxes (Central Coast Council 2016). Hollows to be translocated will be those that are structurally sound to the extent that they survive the trees felling and subsequent translocation. The suitability of each hollow is to be determined during pre-clearance surveys by an ecologist.

Trees and stags containing hollows felled during the clearing process will be generally relocated to within the BMP Area and used for habitat reconstruction. Hollows will be trimmed by a tree removal specialist and will be installed in trees within the BMP Area in accordance with the *Central Coast Council Guideline for the Relocation of Large Tree Hollows* (Central Coast Council 2016). This document provides detailed recommendations for the salvaging of tree hollows, including the steps to follow in removing tree hollows, treating them with oil and strapping them to ensure their longevity and installing them appropriately into their new surrounds to maximise future use by hollow-dependant fauna species.

Habitat features are to be generally stored until such time as restoration of the BMP Area commences. Storage must be undertaken within designated stockpile areas, with onsite contractors made aware material is to be retained, to prevent loss of stored habitat features prior to utilisation. Placement of stored habitat features within the BMP Area will be undertaken in accordance with specifications from an ecologist.

Additionally, the Landowner will liaise with Council to ascertain if Council can identify additional sites to receive artificial hollows in suitable habitat up to the offset ratio provided in **Section 5.8**.

5.8. Nest Box/Salvaged Hollow Installation

A nest box will be provided for each hollow above 5 cm in diameter to be removed on a 1:1 ratio. It is anticipated, as per the BCAR, that a total of 19 hollow-bearing trees will be removed from the Subject Land, therefore a minimum of 19 nest boxes will be installed in the BMP Area in addition to any salvaged hollows

from the clearing area. These nest boxes/salvaged hollows should ideally be installed at a density of 10 hollows per hectare. Accordingly, 10 nest boxes/salvaged hollows should be installed in the BMP Area with the remaining 9 nest boxes being installed offsite, but if Council cannot identify suitable offsite areas and grant timely access on a reasonable basis, the remaining 9 nest boxes should be installed in the BMP Area. No less than 75% of the required number of nest boxes (15 nest boxes) are to be installed at least two weeks prior to the commencement of clearing.

These nest boxes will be monitored as part of regular monitoring of the BMP Area (see **Chapter 8**) to determine their usage by fauna species and to ensure they remain serviceable in the long term.

5.9. Erosion and Sediment Control

Potential impacts to flora and fauna occurring in the construction phase that can be managed include run-off, sedimentation, erosion and pollution. To reduce sedimentation on the construction site, erosion control measures will be implemented including minimising the amount of exposed soils at any given time. All soil stockpiles should be adequately covered when not in use to prevent erosion from heavy rainfall. Clearing should not take place during periods of heavy rain to minimise erosion and sediment run-off.

Sediment fences will be established around the perimeter of the development area as outlined previously to prevent the impacts of sedimentation on the adjoining vegetation. During construction, precautions will be taken to ensure that no pollution, such as petrochemical substances or water containing suspended solids, escapes the construction site. Pollution traps and efficient removal of pollution to an off-site location would help to minimise pollution impacts.

6. Weed and Pest Management Plan

6.1. Introduction

6.1.1. Objectives

The BMP Area contains several Priority Weed species identified in the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2021). In addition, future development within the Subject Land has the potential to contribute to the spread of exotic species, including garden escapees, into the BMP Area.

In addition to weeds, a number of pest animals occur within the Subject Land and surrounding areas that are a threat to native flora and fauna and future restoration works as a result of competition for resources, predation, general displacement, and degradation of native vegetation.

The objectives of weed and pest management in the BMP Area are to control the existing weeds and pests that occur to facilitate the recovery of the native vegetation and fauna present and to prevent the establishment of any additional weed and pest species, through ongoing maintenance and management.

6.1.2. Relevant Legislation

Under the NSW *Biosecurity Act 2015* (Biosecurity Act) all weeds and pests are required to be controlled by all persons under a “General Biosecurity Duty”. The General Biosecurity Duty means that all public and private land owners or managers and all other people who deal with weed or pest species (biosecurity matters) must use the most appropriate approach to prevent, eliminate, or minimise the negative impact (biosecurity risk) of those weeds or pests (DPI 2017). The power for enforcement of penalties relating to compliance with the legislation is given to Local Control Authorities (i.e. Local Governments).

State-wide management of weeds and pests under the Biosecurity Act is directed by the *NSW Invasive Species Plan 2023- 2028* (DPI 2023). This assigns weed and pest responses to four categories:

- Prevention of new weeds and pests establishing;
- Eradication of small and localised infestations where feasible;
- Containment of larger infestations to stop wider spread; and
- Protection of key assets, such as threatened plants and agricultural land, to prevent their damage or degradation by weed and pest invasion.

Under the Biosecurity Act some weed species have been prioritised for management by specific regulations and controls under the Act. These are known as State Level Priority Weeds. Specific legal requirements exist for how these weeds are managed. Thirty-two WoNS have been identified by Australian governments based on their invasiveness, potential for spread and environmental, social, and economic impacts. All 32 WoNS are now included under the Biosecurity Act as State Priority Weeds, and therefore all have specific legislative requirements for management.

All land within the BMP Area is within the Greater Sydney Local Land Services region, and weed management within the region is be undertaken under the guidelines of the *Greater Sydney Regional Strategic Weed*

Management Plan (LLS: Greater Sydney 2021). Appendix 1 of the plan outlines the State Listed Priority Weeds, Regional Priority Weeds, and other weeds of regional concern.

State Priority Weeds, Other Weeds of Regional Concern and WoNS recorded within the Subject Land are detailed in **Table 1**.

Table 1 Weeds and WoNS identified within the Subject Land

Scientific Name	Common name	Priority Status	WoNS?
<i>Andropogon virginicus</i>	Whiskey Grass	Other Weed of Regional Concern	No
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	Other Weed of Regional Concern	No
<i>Cinnamomum camphora</i>	Camphor Laurel	Other Weed of Regional Concern	No
<i>Ligustrum sinense</i>	Small-leaved Privet	Other Weed of Regional Concern	No
<i>Senecio madagascariensis</i>	Fireweed	State Priority – Asset Protection	Yes

6.2. Best Management Practice

Contractors for weed removal within the BMP Area will have regard to the following, to minimise impacts upon existing vegetation and habitats:

- The main principles of the Bradley Method of bush regeneration, i.e. not over-clearing (remove only targeted species), employment of minimal disturbance techniques to avoid soil and surrounding vegetation disturbance, and replacement of disturbed mulch/leaf-litter;
- Removal of fruiting/seeding parts of weeds carefully, to minimise spread of plant propagules;
- Use of chemicals and sprays only during suitable weather conditions (i.e. not during wet or windy conditions), and only during appropriate seasons;
- All equipment must be thoroughly cleaned prior to entering the Subject Land to minimise contamination;
- Proximity to watercourses and swampy areas; and
- Presence of native fauna or nesting/breeding sites.

6.3. Weed Control Methods

All weed removal works in the BMP Area should be approached using the control methods described in **Appendix B**, and are outlined below.

6.3.1. Manual Weed Removal

Manual removal, or hand weeding, is an effective form of weed control when all viable parts of the plant are removed from the soil (roots, fruiting material and rhizomes) and site. All weeds removed by hand will be handled according to best practice bush regeneration techniques to prevent subsequent seed set from the

removed weeds, and the unviable plant material will be retained on site to provide mulch and natural leaf litter to protect the soil surface.

6.3.2. Woody Weed Removal

Large woody weeds such as *Ligustrum sinense* and *Cinnamomum camphora* are present within the Subject Land and BMP Area. Recommended removal techniques for these species include:

- The selective spraying of woody weed regrowth, with selective and non-selective herbicides;
- Cutting/scraping and painting deep rooted woody weeds and climbers with hand tools, chainsaws and brush cutters and painting cut stumps with herbicides containing Glyphosate or Picloran; and
- Target drilling and injecting certain large tree weeds with herbicides such as Glyphosate and a Garlon/diesel mix.

6.3.3. Use of Herbicides

All herbicides must be used according to recommendations on the herbicide label. Appropriate Personal Protective Equipment should be worn, and consideration given to time of day, likelihood of rainfall, wind direction and likely impact on native species as per guidelines on the label. Use of glyphosate will be appropriate for most species. Glyphosate is the preferred herbicide for use in environmentally sensitive areas as it is rapidly broken down by microbes in the soil so residue is short lived and will not affect remnant and planted native individuals in the long-term following application. In areas near water courses, an appropriate form of the herbicide must be used to minimise impact to aquatic life and amphibians. Herbicide use must be avoided within 2 m of the riparian edges. Examples of appropriate herbicide forms are "Roundup Biactive" and "Clearup Bio 360" which have surfactants that are formulated to minimise harm to amphibians. As runoff is a likely way for herbicide residue to enter watercourses, chemical treatment must be avoided prior to or directly after rains.

It is important to note that there can be legal restrictions and permit requirements for use of specific herbicides for specific plants, and chemical labels and permit requirements always need to be researched prior to herbicide application. The relevant permit numbers are PER9907, and PER11916. These permits need to be obtained from the Federal Government body, the Australian Pesticides and Veterinary Management Authority.

Manual removal will be an appropriate form of control for some species, and all chemical treatment must be carried out according to best practice guidelines. Planting must not occur within 10 days of herbicide application.

6.3.4. Use of Weed Suppression Materials

Use of weed suppression materials such as jute matting or mulch is not recommended within the BMP Area, due to the presence of native species throughout – these materials suppress native regeneration as well as weed germination and are most suitable for areas where revegetation is undertaken in areas where native vegetation does not currently exist, or areas where there is a significant risk of erosion due to soil disturbance.

6.4. Weed Management in the BMP Area

6.4.1. Initial Weed Control

After marking of the clearing boundary has been completed, initial weed treatment in the BMP Area will commence using the methods described in **Appendix B**. This will consist primarily of manually removing individual weeds, with larger infestations of weeds being sprayed with Glyphosate 360g/L at a concentration of 10 mL herbicide to 1 L of water. This strength is commonly used in bushland regeneration works as it will effectively kill most herbaceous weed species. A marker dye should be used in the herbicide solution to ensure no areas are missed. Knapsack sprayers with a spray cone to direct the spray towards the ground are recommended to be used to prevent herbicide drift into adjacent vegetated areas. Spraying should be adjusted based on on-ground conditions and should target areas with weed infestations. Spraying should only be used on large infestations that would either take too long, or be too difficult, to completely remove by hand, to reduce the impact of herbicides on surrounding native vegetation.

Following the initial spraying, the site should be left for three weeks to allow time for any treated weeds to die back. After this period the treated areas should be resprayed with Glyphosate again, with a focus made on treating any exotic plant species that still have green colouring left in foliage, and any juvenile germinated exotic grasses.

If required, mulch can be laid across the BMP Area in areas that contain no native plants. In areas containing native plants, the mulch can be spread on the ground surface around the occurrences of remnant native plants. If mulch is used, a certified weed-free mulch of known provenance should be used.

6.4.2. Ongoing Weed Maintenance

Weed suppression methods such as mulching/matting will suppress mass regrowth of weeds within the BMP Area, but not entirely prevent regrowth of weeds. The most cost and time effective method of controlling weed regrowth will be by spraying a non-selective Glyphosate herbicide. This is only to be used for large infestations. If targeting individual weeds, then wick wiping/direct press techniques are advisable.

Ongoing maintenance of the BMP Area by the Bushland Regeneration Contractor (BRC) should involve the BMP Area being inspected and managed in its entirety biannually (twice-yearly), to diminish the soil seed bank of exotic weed species present on site. To eliminate the occurrence of these species they need to be controlled before they have a chance to set seed, otherwise progress on the site will not be made.

Tree guards must remain around all native planted trees and shrubs, for at least 18 months to protect them from herbivory. Rabbits can devastate revegetation areas soon after planting if tree guards are not used. Tree guards will also allow herbicide to be used for control of most regrowth weeds, without damage to native plants by herbicide drift.

The following sequential steps are recommended to manage each area of the BMP Area effectively for each site visit:

- Initially the bushland regeneration team working in the BMP Area should work from one end of each area to the other. During this work weeds occurring within each tree guard alongside native plants should be

removed by hand and any weed occurring within a patch of dominant native plants (such as a patch of grasses).

- A member of the team should then work through the entire area, spraying all regrowth weeds between native plantings/remnant natives in open areas with herbicide, and spot spraying where possible in regeneration areas.

It is important during visits for ongoing weed maintenance that as many weed species as possible are controlled. This will minimise maturity and set seed of weeds between site visits. Some weed species are prolific seeders, and many exotic plants can have seed that remains viable in the soil for long periods of time. To effectively diminish the soil seed bank occurrences of exotic species it is important that individuals are not allowed to set seed.

During visits for weed control, Priority Weeds and WoNS must be prioritised for control. Individual plants of these species on site should not be allowed to achieve a reproductive stage in their life cycles. Temporary sediment fencing should be retained until it is determined plants have sufficiently established to prevent surface soil erosion.

It is recommended that signs of rabbit herbivory be noted during site visits, and control measures undertaken if significant impacts to planted vegetation are occurring threatening the long-term viability of the BMP Area.

6.4.3. Exotic Animal Control

A trapping and/or baiting program should be implemented for the control of foxes within the BMP Area as required. These programs are to be undertaken in conjunction with existing plans or programs run by EHG and other relevant organisations. In order to prevent the further colonisation of the BMP Area by the Common Myna (*Acridotheres tristis*), all nest boxes are to be fitted with anti-Myna baffles to prevent the Common Myna from nesting inside them.

7. Revegetation Plan

7.1. Introduction

This chapter provides details for the restoration of the native vegetation within the two management zones of the BMP Area. Although this area contains substantial native canopy vegetation cover, there are gaps in the canopy, with a very small portion comprising of exotic vegetation. The objective of this revegetation plan is to provide details of the measures that will be implemented in this area to replace and rehabilitate the missing components of the natural vegetation and enhance the biodiversity value of this area.

7.2. Revegetation Preparation

The revegetation of disturbed areas of the BMP Area will require the treatment of soils, the installation of protective plant fencing, and ongoing maintenance treatments such as watering and weeding. Recommended revegetation strategies include:

- Initial and ongoing control of weeds and competing grasses using bushland regeneration techniques and conventional best practice chemical and physical strategies as outlined in **Chapter 6**;
- Use of local provenance plants;
- Treatment of soils within each planted tube stock plant hole with a plant establishment aid that contains a mix of materials such as slow and quick release fertilisers, water holding crystals, rooting hormones and wetting agents, (i.e. products such as Terra Cottem by TC Advantage Pty Ltd or Sure Start by Barmac). These agents assist in establishing newly installed plants and can reduce establishment watering resources by up to 50%;
- Suppressing weeds around plantings using products, such as 40 cm square jute fibre mats or woodchip leaf mulch to a 50 cm diameter and 10 mm depth, noting that mulch is not to be placed up against the trunks of trees;
- Protecting individual tree and shrub plantings with a tree guard from feral animal grazing, frost and maintenance herbicide spraying overspray. Bamboo stakes 3 x 10-12 mm x 750 mm and 1 x 350 mm x 450 mm plastic tree guards are suitable for this purpose; and
- Maintaining revegetated areas (including watering, weeding, replacing dead plant material and repairing/replacing weed mat/mulch), as a part of an ongoing maintenance.

7.3. Recommended Revegetation Techniques

Appropriate plant species for PCT 1619 within the BMP Area are provided in **Appendix C** and are to be used for revegetation using plants sourced from local provenance (within the local area). Plants may be sourced from seed collections or cuttings from within the existing remnant vegetation within the Subject Land or from commercially attainable tube stock.

Natural regeneration from the seedbank will be encouraged in areas currently mapped as comprising native vegetation forming the PCT identified within the Subject Land; however, in the areas comprising cleared land assisted regeneration will likely be required to establish and restore the native vegetation.

7.3.1. Species Selection

It is recommended that a mix of local native trees, shrubs, and ground layer plants are replanted at the specified densities outlined below. Lists of suitable plant species are provided in **Appendix C**. All plants will be disease and pest-free, hardened off and well-watered at the time of planting. All plants are to be provided in a healthy condition. They must have good root development and a sturdy shoot system.

Final species selection will be based upon:

- Known use by Squirrel Gliders and other threatened fauna (trees/shrubs);
- Availability of seed material;
- Exclusion of plants likely to naturally regenerate on the site; and
- Previous experience with species re-vegetation performance.

7.3.2. Planting Densities

The recommended planting specifications for the BMP Area (where required) are:

- Canopy Trees @ 1 unit / 4 m².
- Shrubs @ 1 unit / 2 m² (can be differentially spaced across the BMP Area in thickets).
- Groundcovers @ 4 units / 1 m² planted in clumps/thickets or singly.

Differential cover of shrubs will also provide a greater diversity of fauna habitat, particularly for some small, woodland birds which forage in grassy areas and shelter in shrub thickets. Trees and shrubs should be planted unevenly in patches to mimic natural distribution. Planting should be avoided within 10 metres of existing (retained) canopy trees or in areas where natural regeneration of native trees and shrubs is occurring.

Natural regeneration will be encouraged, with planting of canopy species only undertaken where needed if natural regeneration does not occur in months following weed removal. If required, canopy species will be planted in bare patches. Planting of understorey and ground layer species will be undertaken to restore areas where dense weed infestations have been removed and for the purposes of increasing species diversity in these strata.

7.3.3. Characteristic Planting Units

Native species should be planted in characteristic planting units to correspond with the topography, aspect, soil type and proximity to water.

Grasses may be planted in clumps of 3+ (spaced 15–20 cm apart within clumps) to generate physical / structural support for each other and microclimates. Wind pollinated grasses such as *Themeda triandra* (Kangaroo Grass) may be particularly planted in clumps to aid fertilisation and to create a natural grassland understorey within the restoration areas. Trees and shrubs should be planted unevenly in patches to mimic natural distribution.

7.3.4. Planting Supply

Any tube stock will be purchased of local provenance native plants identified in **Appendix C**. If the required quantities of tube stock are not available, then it may be necessary to collect or source suitable quantities of local native seed for propagation.

If required for propagation, local native plant propagules should be collected using principles prescribed in 'Bringing the Bush back to Western Sydney' (DIPNR 2003). Seeds and vegetative propagules should be of local provenance, preferably from within 10 km of the Subject Land. Material should be propagated in a local commercial or community nursery, with well-established plants used for revegetation, for trees and shrub species particularly. It may be necessary to get the required amounts of seed and vegetative material contract-collected and grown-on by specialist nurseries. Local native plants should be grown in "Hiko" tube, maxi cell or viro-tube, or Forestry Tube-type containers.

7.4. Maintenance

After planting works have been completed, treated areas within the BMP Area should be maintained by appropriately qualified personnel, selectively spot spraying and hand weeding around native plants, watering plants and replacing dead plants as needed.

Provision should be made to irrigate areas, as required, in the first 3 months after installation, (on at least 4-5 occasions, depending on rainfall conditions, more watering if required). Note that a permit from the NSW Office of Water may be required to use water for watering-in newly installed plants.

Re-growing environmental weeds such as vines, woody trees and shrubs, broadleaf annuals and naturalised grasses should be closely monitored and controlled using ecologically sensitive bushland regeneration hand weeding and spot-spraying methods, to ensure adequate weed control and native plant establishment (refer to **Chapter 6**). Weeding inside each planting bag by hand or selective herbicides will be required, as well as in an approximate 50 cm radius around the outside of each plant and tree guard.

Plants that have died due to drought or pest and disease damage must be replaced as required. Plants that are observed to have died should be replaced by the bushland maintenance team with a planting of the same form.

Maintenance of retained trees, including trees planted on residential allotments, will also be undertaken and be detailed in ongoing reports for the five-year period from the date of the Agreement, or until development completion, whichever occurs later unless otherwise agreed with the BCD.

8. Monitoring and Reporting

8.1. Responsibilities

A suitably qualified project manager/ecologist should liaise with the BRC in the coordination, supervision, and management of all works with respect to the management of the BMP Area.

8.2. Monitoring

A qualified bushland management or ecological consultant will carry out a program of regular monitoring of the implementation of the BMP. The monitoring program will be carried out for the duration of the BMP and a monitoring survey will be completed every 12 months for five years from the date of the Agreement (10/02/2023), or until development completion, whichever occurs later unless otherwise agreed with BCD.

General observations of the nature and condition of the vegetation within the BMP Area along with the collection of quantitative data, in the form of two 20 m x 20 m quadrats, and one 10 m x 10 m quadrat, will be taken during each monitoring period. These monitoring plots will be undertaken according to the BAM. The two 20 m x 20 m plots are to be placed within Management Zone 1, and the 10 m x 10 m plot is to be placed in Management Zone 2. Monitoring will include the following:

- Photo reference points will be established at fixed locations in the BMP Area and a photograph shall be taken at each photo reference point for a visual assessment of site progress;
- Plot based monitoring of the BMP Area, comprising:
 - Composition for each growth form group by counting the number of native plant species recorded for each growth form group within each plot;
 - Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within each plot;
 - Cover of 'High Threat Exotic' weed species within each plot; and
 - Exotic to native understorey ratio.
- Estimates of the success rate of plantings and natural regeneration, and assessment of plant replacement requirements;
- Weed abundance and locations of significant weed infestations in the BMP Area; and
- Recommendations for corrective measures and/or vegetation management.

The indicative locations of the monitoring points are provided in **Figure 7**. The exact locations of the monitoring points will be determined closer to the first round of monitoring.

During the monitoring surveys of the BMP Area, the installed nest boxes/salvaged hollows and any retained hollow-bearing trees will be monitored to determine their usage by native fauna species. During each monitoring survey, each nest box/salvaged hollow or hollow-bearing tree will be inspected using a camera on a pole and the results recorded, including the number and species of the fauna recorded. The condition of the nest box will also be recorded in order to identify when they need replacing due to damage or age.

8.3. Reporting

8.3.1. BMP Area Monitoring

A brief and concise report will be prepared annually based on the findings of the annual monitoring period. The report will be forwarded to the Environment Agency Head for approval within 60 days after the end of each reporting period, each year for five years from the date of the Agreement, or until development completion, whichever occurs later unless otherwise agreed with the BCD. This report will be based around the points outlined in **Section 8.2** and the final report must be submitted to the Environment Agency Head for approval at the end of the five-year period, or development completion, and will certify completion of the works.

Each annual report must:

- Describe the revegetation works undertaken;
- State the findings of the monitoring surveys; and
- Contain site photographs, as well as a short description of weeds in each management zone and a short comparison to the photographs of previous years. Any other notable occurrences of weeds will also be reported. The report will also recommend and prioritise areas where weed control should be targeted for the following maintenance period.

8.4. Timing and Responsibilities

This BMP covers work to be carried out on site over a five-year period. As such, the measures specified in this BMP in relation to the Certified Land will be implemented for the five-year period from the date of the Agreement and for the duration of development works, whichever occurs later unless otherwise agreed with the BCD. In relation to the Avoided Land, the provisions of the Agreement apply in perpetuity as follows:

- The landowner or any future landowners must ensure that there is no disturbance of the Avoided Land, including the removal of any native vegetation, fallen timber or habitat, or any earthworks;
- The landowner or any future landowners must comply with this BMP generally;
- The landowner or any future landowners acknowledge that the aforementioned dot points apply despite any legislation, regulation, rule or code which provides that the landowner is permitted to clear vegetation on the Avoided Land; and
- The landowner or any future landowners must take all reasonable steps to ensure that persons who enter or intend to enter the Avoided Land comply with the obligations listed above.

The BMP Area is to be managed in a series of phases as follows:

- Phase 1 – Site establishment and construction of proposed development;

- Phase 2 – Revegetation and weeding;
- Phase 3 – Maintenance; and
- Phase 4 – Monitoring and Reporting

Timing for each phase of management within the BMP Area are shown within **Table 2** overleaf. Responsibility for each activity within each phase will be allocated by the Landowner.

Table 2 Timing and responsibilities

Management Zone	Action	Performance Criteria	Timing
Phase 1: Site establishment and construction of proposed development			
Extent of clearing boundary	Installation of sediment/erosion controls	Sediment/erosion control have been installed around the perimeters of all clearance works, including around the TPZs of any retained trees.	Prior to commencement of clearing works
Extent of clearing boundary	Delineation of clearing boundary	Temporary fencing has been installed around the perimeters of all clearance works.	Prior to commencement of clearing works
Extent of clearing boundary	Vegetation clearance	Vegetation removed under ecologist supervision following completion of pre-clearance surveys. Any logs, bushrock, or salvaged hollows removed have been placed within the BMP Area	During construction works
Phase 2: Revegetation and primary weeding			
All Zones	Primary weeding conducted across BMP Area	All woody weeds, or large infestations, have been removed from the BMP Area and all other weeds have been treated	First two months of restoration works
Zone 1	Revegetation. PCT 1619 species will need to be planted, where gaps occur	Areas requiring revegetation have been planted to the specifications outlined in Chapter 7 , using the species in Appendix C .	Immediately upon establishment of BMP Area – Within first month
Zone 2	Revegetation. PCT 1619 species will need to be planted	Cleared areas have been planted to the specifications outlined in Chapter 7 , using the species in Appendix C .	Immediately upon establishment of BMP Area – Within first month
BMP Area	Installation of permanent fencing and educational signage	Permanent fence and educational signage has been installed around the boundaries of the BMP Area.	Following completion of clearing works
BMP Area	Carry out secondary weeding	Manual removal of individual weeds	Following primary weeding, site visits quarterly.

Management Zone	Action	Performance Criteria	Timing
Phase 3: Maintenance			
All Zones	Fixed Point Monitoring	Photographs (4 total) of fixed monitoring sites to compare the survival and retention of plantings	Annually for five years from date of Agreement, or until development completion, whichever occurs later unless otherwise agreed with BCD.
All Zones	Carry out maintenance weeding (control of all weed species including annual weeds) throughout management zones	Weed coverage targets (all weed species) achieved at end of year 5, or development completion: less than 2% woody weed cover in any 1000 m ² ; and less than 20% exotic ground cover in any 1000 m ² .	Quarterly for five years from date of Agreement, or until development completion, whichever occurs later unless otherwise agreed with BCD.
All Zones	Maintenance of plantings	0 dead plantings remaining (each replaced with new planting). Plants watered when drought stressed. Additional plantings where required due to observed gaps in any strata. Densities for each stratum will be as below or greater: Trees @ 1 unit / 4m ² , Shrubs @ 1 unit / 2m ² , Groundcovers @ 4 unit / 1m ² , Replanted canopy species must achieve a median height of no less than three metres.	Quarterly for five years from date of Agreement, or until development completion, whichever occurs later unless otherwise agreed with BCD.
BMP Area	Nest box maintenance	Ensure physical structure of nest boxes is adequate to support fauna use	Annually for five years from date of Agreement, or until development completion, whichever occurs later unless otherwise agreed with BCD.
Phase 4: Monitoring and reporting			
BMP Area	Annual inspection of site	Site inspection completed, as outlined in Section 8.2 .	Annually for the first five years from the Agreement date, or until development

Management Zone	Action	Performance Criteria	Timing
			completion, whichever occurs later unless otherwise agreed with BCD.
BMP Area	Nest box monitoring	Nest box monitoring completed, as outlined in Section 8.2 .	In perpetuity.
BMP Area	Annual Report	Annual report prepared on progress of BMP, as outlined in Section 8.3 .	Annually for the first five years from the Agreement date, or until development completion, whichever occurs later unless otherwise agreed with BCD.

9. References

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APPENDIX A :

Weed Species Recorded in the Subject Land



Table 3 Weed species recorded in the Subject Land

Family	Scientific Name	Common Name
Apiaceae	<i>Cyclospermum leptophyllum</i>	Slender Celery
Apiaceae	<i>Hydrocotyle bonariensis</i>	Pennywort
Asteraceae	<i>Conyza sumatrensis</i>	Tall Fleabane
Asteraceae	<i>Gamochaeta americana</i>	Cudweed
Asteraceae	<i>Hypochaeris radicata</i>	Catsear
Asteraceae	<i>Lactuca saligna</i>	Willow-leaved Lettuce
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed
Asteraceae	<i>Taraxacum officinale</i>	Dandelion
Caryophyllaceae	<i>Cerastium glomeratum</i>	Mouse-ear Chickweed
Cyperaceae	<i>Cyperus brevifolius</i>	Mullumbimby Couch
Fabaceae (Faboideae)	<i>Lotus uliginosus</i>	Greater Bird's Foot Trefoil
Fabaceae (Faboideae)	<i>Medicago minima</i>	Woolly Burr Medic
Fabaceae (Faboideae)	<i>Trifolium repens</i>	White Clover
Iridaceae	<i>Gladiolus undulatus</i>	Wild Gladiolus
Juncaceae	<i>Juncus cognatus</i>	-
Lauraceae	<i>Cinnamomum camphora</i>	Camphor laurel
Malvaceae	<i>Modiola caroliniana</i>	Red-flowered Mallow
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne
Oleaceae	<i>Ligustrum sinense</i>	Small-leaved Privet
Oxalidaceae	<i>Oxalis corniculata</i>	Yellow Wood Sorrel
Plantaginaceae	<i>Plantago lanceolata</i>	Lamb's Tongues
Poaceae	<i>Andropogon virginicus</i>	Whisky grass
Poaceae	<i>Anthoxanthum odoratum</i>	Sweet vernal-grass
Poaceae	<i>Axonopus fissifolius</i>	Carpet Grass
Poaceae	<i>Bromus catharticus</i>	Brome Grass
Poaceae	<i>Cenchrus clandestinus</i>	Kikuyu
Poaceae	<i>Lolium perenne</i>	Perennial Ryegrass
Poaceae	<i>Paspalum dilatatum</i>	Dallisgrass
Poaceae	<i>Poa annua</i>	Winter Grass
Poaceae	<i>Setaria parviflora</i>	Pigeon Grass
Poaceae	<i>Sporobolus africanus</i>	Parramatta Grass
Rubiaceae	<i>Richardia humistrata</i>	-
Verbenaceae	<i>Verbena bonariensis</i>	Purple Top
Verbenaceae	<i>Verbena quadrangularis</i>	-

APPENDIX B :

Weed Control Methods



Table 4 Weed species priority status and control method

Family	Scientific Name	Common Name	Priority Status	WoNS	Control Method
Apiaceae	<i>Cyclospermum leptophyllum</i>	Slender Celery		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Apiaceae	<i>Hydrocotyle bonariensis</i>	Pennywort		No	- Mechanical - using a shovel or mattock Dig up underground rhizomes - Extremely time consuming and impractical - use a wick/wand to apply undiluted Glyphosate to leaf surface
Asteraceae	<i>Conyza sumatrensis</i>	Tall Fleabane		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L - On-going grubbing (all year)
Asteraceae	<i>Gamochaeta americana</i>	Cudweed		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Asteraceae	<i>Hypochaeris radicata</i>	Catsear		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Asteraceae	<i>Lactuca saligna</i>	Willow-leaved Lettuce		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	SP	Yes	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Asteraceae	<i>Taraxacum officinale</i>	Dandelion		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Caryophyllaceae	<i>Cerastium glomeratum</i>	Mouse-ear Chickweed		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L

Family	Scientific Name	Common Name	Priority Status	WoNS	Control Method
Cyperaceae	<i>Cyperus brevifolius</i>	Mullumbimby Couch		No	- Hand Weed - Remove strong network of rhizomes from which individual plants can regenerate - Spot Spray - Glyphosate 10mL/1L
Fabaceae (Faboideae)	<i>Lotus uliginosus</i>	Greater Bird's Foot Trefoil		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Fabaceae (Faboideae)	<i>Medicago minima</i>	Woolly Burr Medic		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Fabaceae (Faboideae)	<i>Trifolium repens</i>	White Clover		No	- Hand Weed – Spot Spray - Glyphosate 10mL/1L
Iridaceae	<i>Gladiolus undulatus</i>	Wild Gladiolus		No	- Dig out with hand tools - Care needs to be taken to removal all small cormels present under the main corm - May require bagging and removal of soil around the main corm to remove all cormels - Spray regrowth seedlings with glyphosate 10mL/1L
Juncaceae	<i>Juncus cognatus</i>	-		No	- Use a hand mattock to dig individuals out, taking care to remove all below ground vegetative material. Follow up treatment will be needed for new seedlings, and regrowth from missed rhizomes. - Spray foliage with glyphosate 20 mL/1L (of environmentally sensitive solution in waterways)
Lauraceae	<i>Cinnamomum camphora</i>	Camphor laurel	OWRC	No	- Hand weed seedlings - Spray seedlings and coppice regrowth with glyphosate 10mL/1L - Drill and inject stem with, or chisel and apply, undiluted glyphosate - Cut and paint stump with undiluted glyphosate (will require an arborist for large trees) - Cut and grind stump of large trees (arborist)

Family	Scientific Name	Common Name	Priority Status	WoNS	Control Method
Malvaceae	<i>Modiola caroliniana</i>	Red-flowered Mallow		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne		No	- Hand weed - Spray with glyphosate 10mL/1L - Cut large, firmly rooted individuals at the base with secateurs and paint with undiluted glyphosate
Oleaceae	<i>Ligustrum sinense</i>	Small-leaved Privet	OWRC	No	- Hand weed juveniles - Drill holes with power drill with thick drill bit into mature trees, around base of trunk and fill holes with undiluted glyphosate. Once glyphosate has been absorbed refill holes with undiluted glyphosate several times. - Cut shrub and mature individuals as close to ground as possible with loppers or hand saw (or chainsaw) and treat stump with undiluted glyphosate - Spray juveniles and regrowth foliage of cut and painted individuals with glyphosate 10mL/1L
Oxalidaceae	<i>Oxalis corniculata</i>	Yellow Wood Sorrel		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Plantaginaceae	<i>Plantago lanceolata</i>	Lamb's Tongues		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Andropogon virginicus</i>	Whisky grass	OWRC	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	OWRC	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Axonopus fissifolius</i>	Carpet Grass		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L

Family	Scientific Name	Common Name	Priority Status	WoNS	Control Method
Poaceae	<i>Bromus catharticus</i>	Brome Grass		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Cenchrus clandestinus</i>	Kikuyu	OWRC	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Lolium perenne</i>	Perennial Ryegrass		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Paspalum dilatatum</i>	Dallisgrass		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Poa annua</i>	Winter Grass		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Setaria parviflora</i>	Pigeon Grass		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Poaceae	<i>Sporobolus africanus</i>	Parramatta Grass		No	- Dispose of waste carefully, as smallest cutting can regrow.
Rubiaceae	<i>Richardia humistrata</i>	-		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
Verbenaceae	<i>Verbena bonariensis</i>	Purple Top		No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L

Table Key: OWRC = Other Weed of Regional Concern, SP = State Priority Weed, WoNS = Weed of National Significance

APPENDIX C :

PCT 1619 Species Planting List



Table 5 PCT 1619 species planting list

Family	Scientific Name	Common Name
Canopy		
Myrtaceae	<i>Angophora costata</i>	Sydney Red Gum
Myrtaceae	<i>Corymbia gummifera</i>	Red Bloodwood
Myrtaceae	<i>Eucalyptus capitellata</i>	Brown Stringybark
Casuarinaceae	<i>Allocasuarina littoralis</i>	Black She-Oak
Shrub		
Proteaceae	<i>Banksia spinulosa</i>	Hairpin Banksia
Phyllanthaceae	<i>Phyllanthus hirtellus</i>	Thyme Spurge
Proteaceae	<i>Persoonia levis</i>	Broad-leaved Geebung
Proteaceae	<i>Persoonia linearis</i>	Narrow-leaved Geebung
Thymelaeaceae	<i>Pimelea linifolia</i>	Slender Rice Flower
Myrtaceae	<i>Leptospermum polygalifolium</i>	Tantoon
Ericaceae	<i>Epacris pulchella</i>	Wallum Heath
Fabaceae (Mimosoideae)	<i>Acacia myrtifolia</i>	Red-stemmed Wattle
Myrtaceae	<i>Leptospermum trinervium</i>	Slender Tea-tree
Fabaceae (Faboideae)	<i>Gompholobium latifolium</i>	Golden Glory Pea
Pittosporaceae	<i>Billardiera scandens</i>	Hairy Apple Berry
Asphodelaceae	<i>Xanthorrhoea latifolia</i>	-
Groundcover		
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken
Poaceae	<i>Entolasia stricta</i>	Wiry Panic
Poaceae	<i>Themeda triandra</i>	Kangaroo Grass
Asparagaceae	<i>Lomandra obliqua</i>	-
Cyperaceae	<i>Lepidosperma laterale</i>	Variable Sword-sedge
Cyperaceae	<i>Ptilothrix deusta</i>	-
Poaceae	<i>Imperata cylindrica</i>	Blady Grass
Poaceae	<i>Aristida vagans</i>	Threeawn Speargrass
Poaceae	<i>Panicum simile</i>	Two-colour Panic
Asphodelaceae	<i>Dianella caerulea</i>	Blue Flax-lily
Haloragaceae	<i>Gonocarpus tetragynus</i>	-
Campanulaceae	<i>Lobelia purpurascens</i>	Whiteroot
Goodeniaceae	<i>Goodenia heterophylla</i>	-
Fabaceae (Faboideae)	<i>Glycine clandestina</i>	-

FIGURES



Legend

-  Subject Land
-  Avoided Land
-  Certified Land

Coordinate System: MGA Zone 56 (GDA 94)
Image Source:
Near Map 2023
Date: 05.03.2023



Figure 1. Location of Certified Land and Avoided Land within the subject land





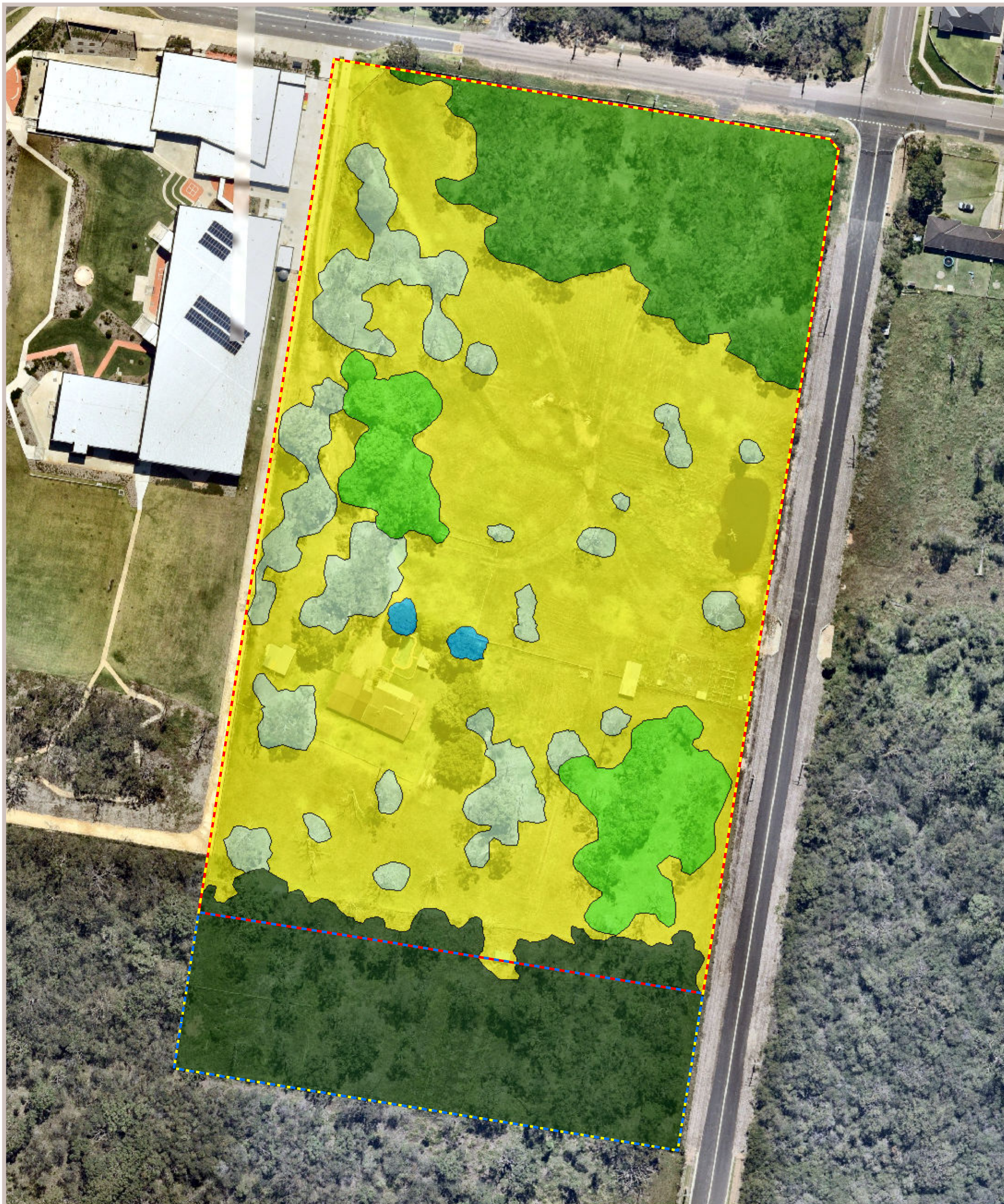
- Legend**
- Subject Land
 - BMP Area
 - Development Site Footprint

Coordinate System: MGA Zone 56 (GDA 94)
Image Source:
Near Map 2023
Date: 05.03.2023



Figure 2. Location of the subject land and BMP Area

0 50 m



Legend

- Subject Land
- BMP Area
- Development Site Footprint

Vegetation Communities

- 1. PCT1619 - Good - shrubs intact
- 2. PCT1619 - Good - shrubs removed
- 3. PCT 1619 - Moderate
- 4. PCT 1619 - Low

- Planted Native Vegetation
- Exotic Vegetation / Cleared

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:
Near Map 2023
Date: 05.03.2023



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Figure 4. Vegetation communities in the subject land

0 50 m



Legend

- Subject Land
- BMP Area
- Development Site Footprint

Threatened Flora

- Callistemon linearifolius

Coordinate System: MGA Zone 56 (GDA 94)
 Image Source:
 Near Map 2023
 Date: 05.03.2023



Figure 5. Threatened flora locations within the subject land

0 50 m



Legend

- Subject Land
- BMP Area
- Development Site Footprint

Habitat Feature

- | | | |
|---|---|--|
| ● Allocasuarina stand | ● Hollow log | ● Stag |
| ● C.gummifera feed tree | ● Hollow-bearing Tree | ● Stag, Termite Nest |
| ● Dam | ● Hollow-bearing Tree, Termite Nest | ○ Termite Nest |
| ● Damp area | ● Pond | ● Timber Pile |

Coordinate System: MGA Zone 56 (GDA 94)
 Image Source:
 Near Map 2023
 Date: 05.03.2023



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Figure 6. Habitat features of the subject land

0 50 m



Legend

- Subject Land
- BMP Area
- Development Site Footprint
- Monitoring Plots

Management Zones

- Management Zone 1 – PCT 1619 Assisted Regeneration
- Management Zone 2 – PCT 1619 Active Revegetation

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:
Near Map 2023
Date: 05.03.2023



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Figure 7. Management zones and monitoring plots within the BMP Area

0 50 m



- Legend**
- Subject Land
 - BMP Area
 - 1.5 m Bollards
 - Permanent Fence

Coordinate System: MGA Zone 56 (GDA 94)
 Image Source:
 Near Map 2023
 Date: 05.03.2023



Figure 8. Fencing plan within the BMP Area

0 50 m