Tallawarra B Power Station

Vegetation Offset Plan

EnergyAustralia Tallawarra Pty Ltd

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Abbreviations

Abbreviation	Description
СоА	Conditions of Approval
EMS	Environmental Management Strategy
km	Kilometres
kV	Kilovolt
m	Metres
mm	Millimetres
MW	Megawatts
NSW	New South Wales
OCGT	Open Cycle Gas Turbine
PCT	Plant Community Type
RFS	Rural Fire Service
Sp	Species
Spp	Species (plural)

1 Introduction

1.1 Overview

The Tallawarra B Gas Turbine Power Station Project Approval 07_0124 was granted under Section 75J of the *Environment Planning and Assessment Act 1979*, Modification 2 dated December 2020. This vegetation offset plan is prepared under as part of Condition of Approval (CoA) 3.41 for the Tallawarra B 400-megawatt gas fired power station (the Project). This plan details the required compensatory planting requirements as specified in the project approval for vegetation offsetting. This plan identifies the project background, the assessment of the compensatory planting required and details of the site establishment requirements for the offset planting.

1.2 Responsibility for achieving plan

Energy Australia will be responsible for all activities and tasks associated with compensatory planting and meeting offset obligations. This includes all planning, site establishment, planting, monitoring and maintenance requirements as detailed in CoA 3.41.

The plan shall be implemented in accordance with the specified measures and timeframes, unless otherwise agreed to by the Secretary.

1.3 **Project background**

1.3.1 Project site and surrounds

The Project is located adjacent to the existing Tallawarra A Power Station on Yallah Bay Road, Yallah. The site is located on the western bank of Lake Illawarra and on the southern footslopes of Mount Brown, which rises to about 130 metres (m). The Project is positioned in a historically disturbed location on the foundations of a former coal power station, which was decommissioned in 1989. The land is owned by EnergyAustralia.

The Tallawarra Lands surrounding the site are currently leased for low density cattle grazing and comprise of undulating grassy slopes.

The location of the project is shown in Figure 1-1.

A security mechanism is required to monitor and maintain the final offset site in perpetuity. In discussion with the Biodiversity Conservation Trust and other relevant stakeholders, EnergyAustralia will investigate available security mechanisms, and implement the security mechanism within 12 months of the completion of compensatory planting.

1.3.2 Project summary

The project involves the construction and operation of an open cycle gas turbine (OCGT) power station and associated infrastructure including a new transmission line, new gas receival station infrastructure and new gas feeder pipeline infrastructure.

Construction of the project would require the temporary establishment of construction ancillary areas adjacent to the project site. This will include the use of some land associated with the Tallawarra A power station.

Following construction, disturbed areas will be rehabilitated, and landscaping will be established.





Power Station Lot boundary

FIGURE 1.1: Site location

1.4 Purpose of this plan

This plan has been developed to meet legislative requirements as detailed via the Conditions of Approval (CoA) issued by the Minister of Planning. Furthermore, this plan will be produced in consideration of the statement of commitments listed as part of the environmental assessment of the Project.

All other relevant legislative requirements will be followed in accordance with the Project Environmental Management Strategy (EMS).

1.4.1 Conditions of approval

The removal of native vegetation is required as part of the Project and as such this Offset plan has been developed in accordance with Conditions of Approval (CoA) 3.41. Additionally, other CoA are considered in this Offset Plan to enable the objectives of this offset plan to be met, and the plan is also consistent with other CoAs. The Department of Planning, Industry and Environment's (DPIE) project approval conditions relevant to this EMS are listed in Table 1-1.

CoA #	CoA requirement	How addressed
3.38	The Proponent shall ensure that there is no disturbance to the endangered ecological communities, including the Illawarra Subtropical Rainforest in the Sydney Basin Bioregion and the Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions, during the construction and operation of the project	Section 2.1 and FFMP
3.39	The Proponent shall mark the areas of endangered ecological communities with flagging tape or similar prior to commencing construction to ensure that there is no incursion into, or clearing of the areas.	Section 2.1 and FFMP
3.40	The Proponent shall ensure that clearing of native vegetation is limited to the minimal extent required for the construction of the project and shall undertake all reasonable and feasible measures to avoid the clearing of any threatened flora species. All cleared areas shall be stabilised with local native grasses and ground cover plants as soon as practicable to minimise soil erosion.	Section 2.3, 2.4, 3.10, 3.11, FFMP and SWMP
3.41	At least one month prior to the commencement of construction of the project, the Proponent shall develop a plan for offsetting the biodiversity impacts resulting from the removal of any native vegetation. The plan shall be submitted to the Secretary for approval and include as appropriate, but not necessarily be limited to:	This plan
	a) measures for encouraging the natural regeneration of locally native vegetation, including weed management measures as identified in condition 3.44	Section 2.5, 3.2, 3.9 and 4.4
	 b) replanting/compensatory plantings (at a ratio of at least 2:1) and/or land offsets, and rehabilitation measures 	Section 3.5
	c) measures for replacing specific habitat values impacted by the project (e.g. provision of roost/nest boxes where significant habitat trees such as hollow bearing trees are impacted)	Section 3.6
	 d) a timeline for the implementation of the identified measures, including ongoing monitoring and maintenance 	Section 4.4
	e) demonstration of how the plan would achieve the outcome of maintaining or improving biodiversity values in the local area; and	Section 2.4, 2.5, 3.2.1
	f) measures for monitoring and maintaining any offsets in perpetuity.	Section 4
	The plan shall be implemented in accordance with the specified measures and timeframes, unless otherwise agreed to by the Secretary.	Section 1.2
3.42	The Proponent shall establish a riparian zone consisting of local native plant species adjacent to Yallah Creek within the power station site boundary. The width of the riparian zone is to be a minimum of 50 metres on both sides of the creek, where practicable. All works and disturbance areas associated with the construction and operation of the project must be located outside of the riparian zone, including new transmission line poles.	Section 3.2 and FFMP

Table 1-1 Compliance with CoA

CoA #	CoA requirement	How addressed
3.43	The Proponent shall monitor and maintain the riparian zone along Yallah Creek (referred to in condition 3.42) throughout the life of the project.	Section 4, Appendix C and FFMP
3.44	The Proponent shall monitor all rehabilitated areas, offset areas, and riparian zones for weed infestation. Any infestations shall be actively managed to remove or minimise their spread.	Section 4 and FFMP

1.4.2 Statements of commitments

The Project Environmental Assessment, Chapter 9, provides a Statement of Commitments in relation to environmental impact mitigation, management and monitoring during construction and operation. Relevant statement of commitments for the purposes of this offset plan are as follows:

- The proposed disturbance footprint will be clearly defined on-ground, using temporary fencing, to avoid unnecessary vegetation and habitat removal.
- Appropriate weed management strategies will be implemented during construction to ensure they are not spread throughout the study area.
- Revegetation of earthwork areas will be conducted as soon as practicable during the construction phases.
- Monitoring of the revegetated areas will be undertaken to ensure they are functioning as designed.
- The existing landscape planting for Tallawarra Stage A will be enhanced at key locations around the site. The existing earth mound to the east of the site will be elevated to screen the proposed power stations. Native vegetation will be planted on the mound. Vegetation will be retained on the north side of the site and planting will be maximised to reduce views of the site from the Tallawarra Lands area.

1.5 Consultation

EnergyAustralia consulted with the Biodiversity Conservation Division (BCD) via email and an online meeting in early September 2021. BCD was provided with a draft version of the Flora and Fauna Management Plan and this Vegetation Offset Plan (including the draft Landscape Plan) prior to the meeting, and we discussed aspects of both plans and project with a BCD representative. BCD provided formal feedback on both the FFMP and Vegetation Offset Plan on 8 September which has been incorporated in this plan. Stakeholder consultation correspondence is provided in Appendix D.

1.6 Methodology

The development of this Offset Plan included the completion of three initial days of field survey (16 June, 17 June and 12 July 2021) to prepare a detailed inventory of native vegetation that will require clearing at all stages of the Project (including both construction and early works). Offset sites were determined through a field survey and desktop assessment of environmental conditions to determine their suitability. Additional field survey was undertaken on 30 September 2022 to revise the offset planting area to a more suitable area, based on the advice of the New South Wales (NSW) Rural Fire Service (RFS). The new planting area adjoins existing vegetation enhancing connectivity of vegetation in the north east of the site.

For the purposes of this plan, *native vegetation* is considered to be trees/shrubs and saplings of woody vegetation indigenous to Australia in accordance with growth forms as defined by the Biodiversity Assessment Methodology¹. Given the nature of compensatory planting, this does not include ground cover species, vines, scramblers, or forbs as these species are difficult to quantify, and often do not have the long growth time required for woody species.

¹ See list of native species by growth form here: https://www.Imbc.nsw.gov.au/bamcalc/app/assets/NativeSpeciesByGrowthFrom_PowerQuery.xlsx Best efforts have been made to fully identify native species to the species level, to enable similar biodiversity values to be replaced. However, limitations such as the lack of fruiting material or restricted access to plant individuals (such as due to blackberry vine or safety considerations) only allowed some plants to be recorded to the Genus level. For the purposes of this plan, this is sufficient for the identification of native/non-native trees and associated compensatory planting.

2 Clearing area survey

2.1 Location and clearing extent

Clearing will be conducted for Project activities including:

- Site investigations
- Establishment of erosion and sediment control measures
- Development to the power station site
- Development of the gas receival station site
- Establishment of construction ancillary sites
- Establishment of the transmission line easements.

The areas where clearing is required for these facilities are shown as 'impact areas' within Figure 2-1 and consists of laydown areas and car parks, transmission line easement, and proposed pole locations. Further details of these sites are provided in Table 2-1.

No clearing areas are identified (or permitted) within areas of EEC or within the riparian exclusion zone. These areas must be marked off with flagging tape or similar prior to commencing construction to prevent incursion into, or clearing of the areas (as required by the Flora and Fauna Management Plan)

The location of clearing sites has been assessed as per the design dated on the 12th of July 2021. Variations of the design may occur between the initial assessment date and the beginning of construction such that purpose of these sites or required level of impact may change (e.g. proposed car park may instead be utilised for crib huts). Given the level of uncertainty around final design impacts, a conservative approach has been taken which assumes the complete removal of all native trees where assessed. This will have the benefit of allowing flexibility of the design and construction methodology in these areas.

Additional counts of impacted trees will be conducted at the time of clearing which may result in a lower count of impacted trees where changes to the design or construction methodology reduce the need for vegetation clearing. If so, then offset obligations may be less than described within this document. See Section 2.4 for recommendations and examples where required clearing can be reduced.

Alternatively, any additional clearing outside of the areas identified within Figure 2-1 and Table 2-1 has the potential to increase offset obligations and therefore will require further assessment in the form of a count of impacted trees and habitat values such as hollow bearing trees.

2.2 Existing environment

Previous ecological investigations (Aurecon, 2020) identified and mapped vegetation communities present within the site. Communities to be cleared are classified as:

- Planted natives and weeds
- Forest Red Gum and Paperbark mixed planting
- Acacia scrub
- Radiata pine forest
- Eucalypt and casuarina grassy woodland
- Scattered individual trees.

Locations of these communities are shown in Figure 2-1 and a description of each community is provided in Section 2.2.1 to 2.2.5.





- Power Station Lot boundary
 - Tallawarra B gas receival station
 - Existing tower 502
 - Tallawarra B Power Station
- Stringing to existing tower under Endeavour Energy in separate approval
- Construction Ancillary Site 1
 - Construction Ancillary Site 2
 - Construction Ancillary Site 3
 - Construction Ancillary Site 4
 - Construction Ancillary Site 5
 - Switchyard Carpark
- 🚺 🕇 Riparian 50m buffer No Go Area
 - Archaeological sensitivity zone Moderate
 - Archaeological sensitivity zone High
- Construction parking areas
- Proposed pole location
- Threatened ecological commu
- Vegetation community (Aurecon 2021)

 - Coastal Swamp Oak Forest (TEC)
- Eucalypt and casuarina grassy woodland
- Forest red gum and paperbark forest
- Grey gum and forest red gum woodland
- Lowland Dry-Subtropical Rainforest (TEC)

 - Weeds and exotics
- Source: Aurecon, EA, NSW Spatial Services, OEH, Ecological, ESRI, Nearmap

Tallawarra B Power Station

2.2.1 Planted natives and Weeds

This community is largely located adjacent to roadways and within the proposed transmission line easement. The community consists largely of an assortment of native vegetation that was most likely planted as part of Tallawarra Landscape Master Plan (URS, 2006) which has since been heavily invaded by an assortment of weed species, particularly within the understorey.

Whilst native species include some local endemic species such as Swamp Oak (*Casuarina glauca*) and Native Cherry (*Exocarpus cupressiformis*), many natives identified originate from outside the Illawarra region including Bottletree (*Brachychiton rupestris*) and Brush Box (*Lophostemon confertus*). Lantana (*Lantana camara*) and Blackberry (*Rubus fruticosus*) are generally the most dominant weeds although other weed species such as Mickey Mouse Plant (*Ochna serrulate*) and invasive grasses such as Kikuyu (*Pennisetum clandestinum*) are also present. Examples of the community are shown in Figure 2-2 and Figure 2-3.



Figure 2-2 Typical vegetation (mixture of weeds and natives) between poles seven and eight.



Figure 2-3 Planted roadside trees between poles six and seven

2.2.2 Forest Red Gum and Paperbark mixed planting

This is a forest community with a canopy of about 5 – 10 metres high. It is dominated by Forest Red Gum (*Eucalyptus tereticornis*) and Prickly Leaved Paperbark (*Melaleuca styphelioides*), also with tea tree (*Leptospermum spp.*), Bottle Brush (*Callistemon salignus*), Swamp Mahogany (*Eucalyptus robusta*) and Coastal Grey Box (*Eucalyptus bosistoana*) (Figures 2-4 and 2-5).

This community does not correspond with a Plant Community Type (PCT) description as it is a mixed species planting (planted approximately 10 to 15 years ago) and is not a natural formation. However, it is similar to 'MU23 Coastal Grassy Red Gum Forest' (NPWS, 2002). The condition of the vegetation is moderate to high with minimal presence of weed species, although the high density of the tree plantings has resulted in tall thin-stemmed trees with little opportunity for a ground storey to be developed.



Figure 2-4 Typical representation of Forest Red Gum and Paperbark mixed planting at Construction Ancillary Site 1



Figure 2-5 Example of lack of groundcover within the Forest Red Gum Paperbark mixed planting.

2.2.3 Acacia scrub

This community is a scrubland formation with a canopy of about 3 – 5m high. It is a derived vegetation community resulting from colonisation by acacias and other colonising species following past clearing and disturbance of the original vegetation community (Figure 2-6 and Figure 2-7). Acacia species present include *Acacia mearnsii, A.longifolia, A.suaveolens.* The midstorey is generally dominated by large lantana shrubs (*Lantana camara*). Other weed species identified in the understorey includes asparagus weed (*Asparagus spp.*), bitou bush (*Chrysanthemoides monilifera*), fireweed (*Senecio madagascariensis*), blackberry (*Rubus fruticosus*), balloon cotton bush (*Gomphocarpus physocarpus*), oxalis (*Oxalis spp.*), cassia (*Senna spp.*), olive (*Olea europena*) and passion vine (*Passiflora spp.*).

This community corresponds with the PCT 'MU56 Acacia scrub' (NPWS, 2002), and is noted to occur in combination with species common to rainforest and wet sclerophyll forest types.





Figure 2-6 Acacia scrub within Construction Ancillary Site 4

Figure 2-7 Acacia scrub within the switchyard car park area

2.2.4 Radiata pine forest

This is an open forest structure community dominated by exotic radiata pine (*Pinus radiata*) and with a canopy of about 10 – 15 metres high. In more open areas (less canopy cover), the midstorey is dominated by weed species including lantana (*Lantana camera*), cotoneaster (*Cotoneaster spp.*), small-leaved privet (*Ligustrum sinense*). Other weed species identified in the understorey include asparagus weed (*Asparagus spp.*), Bitou Bush (*Chrysanthemoides monilifera*), Fireweed (*Senecio madagascariensis*), blackberry (*Rubus fruticosus*), balloon cotton bush (*Gomphocarpus physocarpus*).

Although a mostly exotic community, occasional paperbarks (*Melaleuca stypheloides*) and acacias (*Acacia mearnsii*) are located within the mid storey, particularly directly adjacent to the road corridor of the existing access road.

2.2.5 Eucalypt and casuarina grassy woodland

This is an open woodland community with assorted eucalypt species including brown stringybark (*Eucalyptus capitellata*), spotted gum (*Corymbia maculata*), lemon scented gum (*Corymbia citriodora*), forest red gum (*Eucalyptus teriticornis*) and coast grey box (*Eucalyptus bosistoana*). There are several additional medium to large trees including willow bottlebrush (*Callistemon salignus*) and swamp oak (*Casuarina glauca*). The ground cover is dominated by couch grass (*Cynodon dactylon*) and other ground herbs including clovers (*Trifoloum spp.*), plantains (*Plantago spp.*), crabgrass (*Digitaria sanguinalis*), and flea bane (*Conyza spp.*).

2.2.6 Scattered individual trees

In some instances, individual trees that do not belong to any of the other identified communities are to be removed. This includes Red Bloodwood (*Corymbia maculata*), Forest Red Gum (*Eucalyptus tereticornis*) and Blackbutt (*E. pilularis*) and other non-surveyed trees that are conservatively assumed to be native species. It is uncertain if these trees are planted or natural regeneration, and they are generally surrounded by a non-native groundcover.

2.3 Native vegetation identified for removal

The survey of clearing areas identified an inventory of 805 native trees of various ages and sizes to be removed for the Project. A count of these trees at each project area is detailed in Table 2-1, with a detailed inventory of trees identified for removal provided in Appendix A.

Table 2-1 Vegetation inventory of clearing areas

Site location	Native vegetation to be removed
Construction ancillary site 1	502
Construction ancillary site 2	14
Construction ancillary site 3	20
Construction ancillary site 4	37
Construction ancillary site 5	32
Gas receival station	8
Switchyard carpark	16
Tallawarra B Power Station	16
Transmission line easement	160
Total	805

2.4 Opportunities for limiting clearing

In compliance with CoA 3.40, clearing of native vegetation is to be kept to the minimal extent necessary. Although the removal of up to 805 native trees is required, the selection of these sites was carefully chosen as the only remaining options due to environment, site access and geographic restraints within the Power Station boundary, with all other disturbed areas already being utilised for the purposes of the project.

However, the inventory of required cleared trees has taken a conservative approach and with it assumed that all native trees within identified laydown and transmission line easement sites will be removed. As such there may be opportunities at each location to retain vegetation and thus minimise required offsets whilst reducing safety and environmental risks. This includes:

Construction ancillary sites 1 - 5

Clearing for temporary works should only be undertaken where necessary. Detailed construction planning should be undertaken to ensure that all areas identified as construction laydown areas need to be cleared. In some cases, it may be feasible to reduce the area of construction ancillary sites, or to protect and retain stands of trees located within the extend of the mapped areas.

Transmission line easement

Clearing estimates have been based upon complete ground clearance of a 6-metre easement either side of the proposed transmission line. Depending on transmission line detailed design, reduced easement widths may be considered in consultation with Endeavour Energy. Some native vegetation may be able to be retained by pruning rather than clearing (in accordance with the relevant National powerline vegetation management requirements).

Where new poles are located within stands of vegetation, a conservative assessment of clearing to support access and pole installation of 100 square metres per pole has been made. Detailed construction planning should seek to minimise the clearing of vegetation for access and construction of new poles.

2.5 Rehabilitation and revegetation

As required within CoA 3.41(a) the regeneration of locally native vegetation and effective weed management is required in addition to the 2:1 compensatory planting ratio. This will be integral in areas where impacts to native vegetation have been identified (as detailed within Table 2-1) as this disturbance will result in the loss of native species, whilst providing the opportunity for further weed establishment. Therefore, effective rehabilitation is required following any disturbance.

The below requirements summarise how disturbed sites are to be rehabilitated such that biodiversity values of the area are maintained and enhanced. Additional details are provided within the associated Flora and Fauna Management Plan for the Project.

2.5.1 Landscaping plan

A separate Project landscaping plan has been prepared in consultation with Wollongong City Council. The landscaping plan seeks to manage the visual impacts of the Project and to optimise the landscaping and revegetation undertaken for the Project. This landscaping plan is not held to the same monitoring, maintenance, and performance requirements as this offset plan (as detailed in CoA 3.41). Therefore, activities conducted as part of the landscaping plan is not considered to contribute to the compensatory targets of this offset plan. The landscaping plan is found in Appendix E of the Flora and Fauna Management Sub Plan.

However, the landscaping plan presents an opportunity to encourage the long-term establishment and regeneration of native vegetation as required within CoA 3.41(a) whilst meeting visual amenity requirements. This is to be achieved using locally endemic species as identified within Appendix B.

2.5.2 Construction rehabilitation and weed management

Throughout all construction and early works activities, the following is to occur to enable weed species to be effectively controlled, and disturbed areas are able to be effectively rehabilitated:

- Washdown of vehicles, boots, and equipment prior to entering site and when moving between vegetated locations.
- Effective stockpile management and use of any weed free imported material to prevent weed invasion
- Reestablishment of disturbed areas with native and locally endemic groundcover species (as detailed within Section 3.11) as soon as practicable
- Active rehabilitation and removal of weed species within the construction site, riparian zones and amongst adjacent retained native vegetation within the Power Station Site Boundary.
- Separation of weed species from native species (weeds not to be used as mulch)
- No stockpiling of weed contaminated material
- Disposal of weed material at an appropriate waste facility
- Management of weed species, particularly the extensive infestation of WoNs such as Blackberry (*Rubus fruticosus*) and Lantana (*Lantana camara*) which are present within the riparian zone and underneath the proposed transmission line easement from pole 4 to 6 (Figure 2-1).

Following the completion of construction and the reestablishment of temporary laydown areas, weeds are to be continued to be suppressed as part of general maintenance of the Power Station Site. A current annual program of herbicide spraying of both priority weeds (such as *Lantana camara*) and other general weeds exists for Tallawarra Power Station and the surrounding Tallawarra Lands, with spraying in each area occurring throughout the year. It is recommended that this program continues, with additional effort placed upon the rehabilitated/landscaped areas to allow native vegetation to establish and thrive.

3 Compensatory planting plan

3.1 Landscaping plan

A separate Project landscaping plan has been prepared in consultation with Wollongong City Council. The landscaping plan seeks to manage the visual impacts of the Project and to optimise the landscaping and revegetation undertaken for the Project. This landscaping plan is not held to the same monitoring, maintenance, and performance requirements as this offset plan (as detailed in CoA 3.41). Therefore, activities conducted as part of the landscaping plan are not considered to contribute to the targets of this offset plan.

The landscaping plan is provided in the Flora and Fauna Management Sub Plan in Appendix E.

3.2 Location options

Four options were considered for the potential offset planting site: Yallah Creek south, Yallah Creek north, the Bowling Club Mound and Duck Creek. These sites were considered as they were on land owned by EnergyAustralia, were not likely to impact on current or future EnergyAustralia activities and were adjacent to known ecological communities or in areas where replanting would provide visual amenity. These options are discussed in detail below.

3.2.1 Option 1 – Yallah Creek south (preferred option)

The current preferred offset planting site is identified north of Tallawarra Power Station along the Yallah Creek drainage line (Figure 3-6). The area is very wet, with saturated soils, in a landscape of rainforest vegetation bordering the Yallah Creek drainage line. There has been historical grazing adjacent to Yallah Creek drainage line, resulting in an open grassy area and a transmission line cutting across the site. (Figure 3-1).

A minimum of 1.2 hectares would be required to accommodate the number of trees (~1770) to be planted. Utilisation of this area would require an access route maintained to the ponds. Buffer zones should be maintained around batters of the ponds and Aboriginal Cultural Heritage sites.



Figure 3-1. Yallah Creek south (preferred option) offset area.

This site is the preferred option and is referred to as 'the offset site' for the remainder of this offset plan. This site is the preferred option due to the following benefits:

- Offset site in this location would contribute to the development of a Yallah Creek riparian zone in line with CoA 3.42. Whilst this condition requires the establishment of a riparian zone specifically within the power station site boundary, riparian vegetation already extends right up to hardstand areas and there is limited opportunity for additional native vegetation planting within the site boundary (Figure 3-6). As such utilising area within the Tallawarra Lands area will allow for further contribution to the development of the Yallah Creek riparian zone, whilst meeting offset obligations and improving biodiversity values within the area.
- The location would not impact upon current and future planned EnergyAustralia activities
- Abundant space is present for the required replanting.
- Planting of appropriate species would provide connectivity between fragmented patches of the threatened ecological community *Illawarra Subtropical Rainforest in the Sydney Basin Bioregion* located along the Yallah Creek drainage line (Figure 3-2 and Figure 3-3). This would improve biodiversity values in the area by enhancing connectivity of existing patches, improving pathways, roosting and sheltering for terrestrial and arboreal fauna.

Whilst some weeds are present such as Spiny-Leaved Sow Thistle (*Sonchus asper*), the site does not contain the infestation of thick woody vegetation such as Lantana (*Lantana carmara*) and Blackberry (*Rubus fruiticosus*) that is present throughout the rest of the Tallawarra site. Therefore, required weeding at site preparation and establishment stage would be minimised (though post planting weed control is required).



Figure 3-2 Rainforest TEC located along Yallah Creek drainage line, north of the offset site.



Figure 3-3 Rainforest TEC along Yallah Creek drainage line, north of the offset site.

3.2.2 Option 2 - Yallah Creek north

Yallak Creek north is another potential offset planting site along the Yallah Creek drainage line (Figure 3-6). This area is currently used as a pasture site with active cattle grazing in the area. It consists of a mostly grassland groundcover along two drainage lines (Yallah Creek and a small drainage line tributary), with some pasture weeds such as Balloon Cotton Bush (*Gomphocarpus physocarpus*). One large, damaged Coral Tree (*Erythrina sp.*) is present at the edge of the vegetated *Illawarra Subtropical Rainforest* riparian zone, and is an identified weed². If this site is selected, it is recommended that the tree, fallen logs and all branch materials are removed to prevent further establishment of the weed, which may cause competition with offset plantings if this site is selected.

During the field inspection a concrete dyke cutting across both drainage lines creating two bio-retention ponds (Figure 3-4) was identified. Common Eastern Froglet (*Crinia signifera*) was aurally observed during field inspection indicating that these ponds are suitable as frog habitat. It is recommended planting does not occur too close to this concrete dyke so tree roots do not damage its structural integrity in the future.

² See <u>https://weeds.dpi.nsw.gov.au/Weeds/CockspurCoralTree#biosecurity</u>

This area is located upon the 'Shellharbour' soil landscape. This landscape is characterised by rolling low hills with a volcanic sandstone geology. Previous soil surveys in the area³ have characterised top soil in the area as heavy clay to sandy loam with a pH between 6.5 to 7.5. Field inspection of the area was conducted following 8mm of rain in the previous 24 hours which resulted in the ground within the drainage lines to become waterlogged, however the upper slopes away from the drainage lines remained relatively dry. Minimal erosion is present, except in areas where cattle have significantly disturbed the soil.

Non-native species observed during field survey include a single fox (*Vulpes vulpes*) and multiple cattle (*Bos taurus*). Whilst the fox will not affect revegetation, cattle have the potential to significantly impact planted seedlings through trampling or grazing. As such cattle access must be excluded from the establishment area with effective fencing for the first five years of establishment.



Figure 3-4 Bio-retention pond within drainage line

3.2.3 Option 3 – Bowling club mound

Discussions with EnergyAustralia identified that a small mound adjacent to the Bowling Club site (Figure 3-5) has the requirement within the Statement of Commitments to be raised and revegetated to meet visual amenity standards. Survey of this mound identified abundant weed species such as Lantana, Blackberry, Castor Oil Plant, Prickly Pear and Rhodes Grass. This would require substantial weed clearing into the long term. Additionally, there is known asbestos contamination issues within the soil in this mound which presents a significant environmental/safety hazard if disturbed.

As such, although this area requires revegetation for screening purposes, it is not suitable as a specific compensatory plantings offset site, due to the risks associated with weed competition, coupled with the hazardous materials present. However, if revegetated for screening purposes, eucalypt species such as Forest Red Gum and Coastal Grey Box, Spotted Gum or Coastal Grey Box could be considered as they can provide adequate screening, and are known to be present nearby and therefore may be more suited to site conditions. Although planting of vegetation in this location to meet screening objectives would require detailed consideration of its suitability based on the hazardous materials present, potential exposures in establishment, as well as consideration potential impacts of tree roots on capping materials.

³ As provided through https://www.environment.nsw.gov.au/eSpade2Webapp



Figure 3-5 Former Bowling Club mound site

3.2.4 Option 4 – Duck Creek

A secondary potential offset site of Duck Creek, located south west of Tallawarra Power Station, has also been proposed by Energy Australia. However as the Yallah Creek offset set can fully meet the obligations of CoA 3.42, there is no need to establish a secondary offset site at Duck Creek. As such, the Duck Creek offset site should only be considered if other external factors prevent the use of Yallah Creek and only once appropriate site investigations have been undertaken.



1:5,500 1:5,500 0 115

Projection: GDA 1994 MGA Zone 56

Metres

230





Legend

	Power Station lot boundary
C.5	Riparian zone buffer - Yallah Creek
	Works Exclusion Areas
	Contour line (2m)
= =	North Drain
2	Waterbody
	Watercourse
	Contour line (2m)
	Access track
Indicat	ive planting locations
•	Rainforest Zone
•	Eucalyptus Zone

Source: Aurecon, EA, NSW Spatial Services, ESRI

 Tallawarra B Power Station

 FIGURE 3-6: Offset site locations

3.3 Aboriginal Cultural Heritage

Aboriginal objects due diligence assessment for the Tallawarra Power Station site has identified the Yallah Creek riparian zone as having a moderate archaeological sensitivity (Niche 2021). Therefore, as planting works will require new ground disturbance further assessment in the form of an Aboriginal Cultural Heritage Assessment will be required in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). Additionally, Aboriginal community consultation will be required in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponent 2010* (DECCW 2010).

Furthermore, all activities associated with this Offset Plan are to occur in accordance the Aboriginal Cultural Heritage Management Sub-Plan for the project .

It is noted that all areas of low archaeological sensitivity identified within Niche (2021) are highly disturbed or modified areas that would not be suitable as an offset site location. As such all suitable locations for the offset site that have been assessed as part of the Aboriginal Cultural Heritage due diligence have a moderate or high archaeological sensitivity. Alternative offsets sites not assessed as part of Niche (2021), such as Duck Creek, will also require due diligence assessment and possibly impact assessment.

3.4 Offsetting schedule

Activities associated with this offset plan will be conducted in accordance with the following schedule:

- Inventory of cleared native trees initial inventory completed as of July 2021, to be updated once all vegetation clearance has been completed.
- Aboriginal Cultural Heritage assessment 12 months prior to planting
- Sourcing of plants (including seed collection and propagation if required) 12 to 18 months prior to planting
- Site preparation works 3 weeks prior to planting
- Planting to be conducted during appropriate seasonal and weather conditions
- Maintenance and monitoring to be conducted in perpetuity following planting

Further details of offsetting activities are provided below in Sections 3.5 to 3.15. Additionally, the planting and maintenance schedule is summarised in Table 4-1. Specific monitoring requirements and maintenance requirements are discussed in Section 4.

3.5 Site plantings

The CoA requires a 2:1 compensatory offset planting for each tree removed. To verify the site planting requirements calculated in this Offset Plan, records must be kept by all contractors that undertake any form of vegetation clearing for the project. All vegetation clearing records must be provided to the HSSE Lead. Vegetation clearing records must include

- Area (square metres) of vegetation removed
- A map of the clearing area
- Date that the clearing was undertaken
- A count and type of any habitat features removed, including hollow bearing trees or stags
- A count of the native vegetation removed. Native vegetation is considered to be trees/shrubs and saplings of woody vegetation indigenous to Australia in accordance with growth forms as defined by the Biodiversity Assessment Methodology.

Subject to validation of the actual vegetation clearing undertaken for the Project, this Offset plan has identified a requirement to offset an estimated 805 trees to be removed. This relates to a minimum of 1,610 trees that require planting as a compensatory offset. Recognising the high costs of conducting additional replanting in subsequent years to replace trees that have not survived the initial planting, it is recommended that an additional 10% of trees are planted to account for potential mortality. As such the it is recommended that 1,771 trees be planted within the offset site. These quantities must be revised following the completion of clearing for the Project to ensure that the offset planting amounts are correct.

Tree selection is guided by those species that occur in surrounding vegetation communities as well as species which can be successfully grown in the area as detailed in local tree planting guides (E.g. https://finder.growingillawarranatives.org/plants/finder and https://www.irbd.com.au/). Using local species increases the chances that trees planted are better suited to the existing conditions, and more likely to successfully establish, avoiding costly follow up in-fill planting in subsequent years.

A broad mix of trees and shrubs are nominated to increase the value of the regrowth vegetation and over time allow for site seeding and secondary regeneration of a desirable species mix. Using a mixture of species will also create structural diversity in growth forms and potentially mitigate the risk of loss of one species from unpredicted changes (which may result in a total stand loss if a monoculture was planted).

To meet these revegetation objectives, the following planting zones are identified:

- Riparian Rainforest planting zone
 - Situated directly along the western side of the planting area and adjacent to the bank of Yallah Creek, to develop a riparian zone
 - Establishing a mixture of rainforest tree and shrub species consistent with the Plant Community Type (PCT) 1300: Whalebone Tree - Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion.
 - Planted to enhance biodiversity outcomes by planting seedlings in a location which will provide a vegetated link upstream and downstream of the offset site, to the existing fragmented patches of the threatened ecological community *Illawarra Subtropical Rainforest in the Sydney Basin Bioregion*.
 - Planting locally endemic species such as Whalebone Tree (*Streblus brunonianus*), Coffee Bush (*Breynia oblonifolia*) and Native Quince (*Alectryon subcinereus*) which are known to occur in the surrounding environment. This would have the benefit of allowing for the collection of native seeds in the surrounding area.
 - This community naturally has minimal groundcover due to the shading caused by the extensive middle and upper stratums of the community. As such the few species that do occur as groundcover consists largely of shade preferring ferns such as Necklace fern (*Asplenium flabellifolium*) and Sickle Fern (*Pellaea falcata*). These species are unlikely to become established until the community has reached a canopy cover close to benchmark conditions (Table 5-1) and exotic groundcovers have been outcompeted by overshading. Therefore, planting of these species is only recommended once community has reached benchmark conditions and where self-seeding of native groundcovers dispersed from adjacent rainforest areas has not occurred.
 - This community contains a high diversity of vine/scrambler species, however it is not recommended for these to be planted during initial plantings, as there will be insufficient mature vegetation to provide suitable climbing support. In some cases, the planting of these species may even smother tree plantings whilst they are small. Additionally, many of these species are common and are able to selfseed successfully without human intervention, such as the Silkpod Vine (*Parsonia straminea*) which spreads via airborne seeds. Therefore, it is likely that these species will colonise the offset area, once the zone approaches benchmark conditions.
- Eucalyptus planting zone
 - Situated on the outer bank of the riparian zone
 - Establishing a mixture of mostly Eucalypt species that also occur in surrounding PCTs such as *PCT* 838: Forest Red Gum Thin-leaved Stringybark grassy woodland on coastal lowlands, southern

Sydney Basin Bioregion and PCT 1326: Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion

- Will enhance habitat values (such as winter flowering gums, potential for developing hollows in the future, shelter and rough/loose bark habitat) associated with the removal of over 300 eucalypt plants adjacent to the existing powerstation, at a more natural location.
- Planting species such as Forest Red Gum (*Eucalyptus tereticornis*), Spotted Gum (*Corymbia maculata*), Woolybutt (*Eucalyptus longifolia*), Thin-leaved Stringybark (*Eucalyptus eugenoides*) and White Feather Honey-myrtle (*Melaleuca decora*) which are known to occur in surrounding environment and grow well with each other. This would have the benefit of allowing for the collection of native seeds in the surrounding area.
- Grassy groundcover species have consistent with this community has been recommended for rehabilitation purposes within Section 3.11. The introduction of native groundcover seeds, and the continued weed maintenance of the offset site will assist in developing a native understorey as canopy cover increases.

Recommended species suitable for planting within the Offset Site and for meeting the above revegetation objectives are provided in Appendix B. A combination of some or all these species can be used depending on plant sourcing ability. However, a greater diversity of the plantings will promote better biodiversity outcomes and lower risk of unsuccessful plantings if unexpected factors cause certain species to become unviable.

Furthermore, it is recommended particular emphasis is placed upon planting of key diagnostic species for each target PCT to achieve revegetation objectives. Therefore, the Eucalypt Zone should contain a sizeable proportion of Forest Red Gum (*Eucalyptus tereticornis*) and the Rainforest Zone should contain a sizeable proportion of Whalebone Tree (*Streblus brunonianus*).

Additional species not listed in Appendix B may be utilised if gathered from a local seed source within target PCTs (i.e. PCT 838, 1300 and 1326) provided that they are neither invasive species or high growth native species such as Sweet Pittosporum (*Pittosporum undulatum*) which have the potential to outcompete desired species.

3.6 Replacement of habitat values

The presence of habitat values has been considered during the species planting selection process as detailed in Table 3-1. Through planting of these species, it is likely that lost habitat will be largely replaced, or if not improved over existing lost vegetation.

Where possible, large woody debris created as a result of native tree removal should be retained and placed within the offset area to provide habitat for small fauna species such as snakes and lizards.

One small hollow (<40mm) was identified within a *Eucalyptus sp.* tree along the proposed powerline easement (pole 1 to 2) and therefore needs to be replaced with a nest box in accordance with CoA 3.41 (c). As this may be suitable roosting for microbat species such as the Little Bent-winged Bat (*Miniopterus australis*) which are known to occur in the local, a minimum of one nest box (to meet a one to one ratio of replacement) is to be installed in line with microbat nest box designs such as detailed in Franks and Franks (2006). Additional nest boxes can be installed if desired and economical.

Location of the nest box is best suited for installation amongst the retained eucalypt planted area north of the Bowling Club Site. Continued monitoring and maintenance of the nest box is to be undertaken to allow a nest box is repaired where required, not invaded by pest species, and determine whether it has been successfully utilised by native species. Monitoring and maintenance requirements for nest boxes are detailed in Table 3-1.

Table 3-1 Nest box monitoring and maintenance requirements

Habitat value	Purpose	Frequency	Responsibility
Nest box monitoring	 To enable the success and viability of nest boxes. Nest box monitoring is to include the below details to assist in the identification of required corrective actions: Name of observer Date of observation Assessment of nest box condition (E.g. structural integrity, evidence of rot/termite activity) Evidence of fauna activity, including pest species such as European Honey Bees (<i>Apis mellifera</i>) and Common Myna (<i>Acridotheres tristis</i>) 	Monitoring of nest boxes is to occur at least at least every six months during construction phase of the project. Upon completion of construction, monitoring can be reduced to once yearly for two years. Upon the second yearly inspection the need for additional inspection can be reviewed.	Energy Australia HSSE

3.7 Signage

Signs should be erected stating that the areas are a compensatory planting zone, it is a livestock exclusion zone and that no access is permitted by unauthorised persons.

No parking for vehicles is to occur in the compensatory planting areas except where used for planting maintenance works (e.g. for weeding)

3.8 Site preparation

Poor weed control is a major cause of failure in many revegetation campaigns (Rutherford et al., 2000). As such effective site preparation is essential to the success of the offset plan.

At least one month prior to planting and when weeds are actively growing, the offset site should be sprayed with a broad spectrum non residual glyphosate-based herbicide which has been manufactured for low aquatic toxicity to aquatic ecosystems (bioactive formulation). This is to only be conducted by a suitably qualified person under the NSW Pesticides Act (1999) and Workplace Health and Safety Act (2011). ChemCert AQF 3 Accreditation is classified as a suitable qualification. Any herbicide use is to be approved by Energy Australia prior to use.

Additionally, given the close proximity to the riparian corridor and the presence of the *Illawarra Subtropical Rainforest* TEC downstream of site, herbicide application must be conducted in accordance with *NSW Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations* (DPI, 2018). This includes measures such as:

- Spraying during appropriate weather conditions (low wind, temperature less than 28°C)
- Use of appropriate spray equipment and nozzles that minimise down drift
- Maintaining a down-wind buffer zone
- Operating sprayers at appropriate height, angle, and pressure to minimise drift

Herbicide treatment is effective only on actively growing plants; therefore, spraying must occur approximately 7 days after rains of over 20 mm or when new growth of at least 50 mm is obvious.

The use of the long-stem planting method (as discussed in Section 3.12.4) will minimise the need for extensive ground ripping and weed management. As such herbicide use is to be restricted to spot spraying in one metre wide strips along the proposed planting contour lines to minimise weed presence that would directly interfere with plantings.

Once the weeds have been sprayed, ripping or digging of the soil must not commence for at least 21 days to enable the herbicide to penetrate the entire plant and reduce its viability.

Historical soil reports for the site⁴ determined the topsoil pH to be 6.5 to 7.5 which is suitable for most plantings. Therefore, no additional soil ameliorates will need to be added.

3.9 Fencing

Given the presence of cattle within the offset site, livestock exclusion fencing is required to be placed around the compensatory planting areas and realigned and moved further east and north, to protect the site from both native and introduced herbivores and enable the planting area to be established and exclude cattle. Design of fencing is to consider potential livestock routes to allow for sufficient passage around the offset site and adjacent threatened ecological communities, so that surrounding land uses can be maintained.

Fencing material can be made from either conventional material (E.g. barbed wire) or electric fencing in accordance with availability, cost and desired maintenance schedule, provided that it is made secure enough to prevent livestock access to all planted seedlings. Choice of fencing material and design is to be decided upon by rehabilitation contractor and EnergyAustralia.

Fencing is to be installed prior to or during the site preparation phase. Exclusion fencing should be inspected during each monitoring period to check that no damage has occurred (see Table 4-1 for monitoring period schedule).

3.10 Erosion and sediment control

Assessment of the offset site identified that soils are relatively stable with no significant erosion present. The proposed long-stem planting method (as detailed in Section 3.12.4) does not require extensive ripping or disturbance of soil except at each individual planting point. Furthermore, the retention of groundcover in between each planting row will allow for sediment capture, as such sediment and erosion issues are expected to be minimal. Therefore, the implementation of erosion and sediment control features is not required and may lead to additional unnecessary disturbance if installed, provided that significantly soil disturbance does not occur.

However, if significance ground disturbance from vehicle tracks/augur holes or drainage line crossings significantly disturb the soil, then sediment controls are to be implemented as per the 'Blue Book' (Managing Urban Stormwater: Soils and construction - Volume 1 (4th edition)) (NSW Government 2004). This will require the construction of sediment fencing on the lower contour slope below where plantings occur to prevent erosion of dug material into the adjacent waterway.

Sediment fencing is to be removed once disturbed ground has been stabilised by groundcover vegetation as confirmed during follow up monitoring event.

3.11 Groundcover seeding

Where required for stabilisation native groundcover seeds should be sowed into the soil to minimise loss of sediment and prevent out-competition of the native groundcover by invasive weeds. Groundcover species should be locally endemic and be consistent with the objectives of each planting zone (i.e. be consistent with target PCTs listed in Section 3.3. Species that would achieve these goals are:

- Common sedge (*Carex longebrachiata*) Eucalyptus Zone
- Kangaroo grass (Themeda australis) Eucalyptus Zone
- Commelina (Commelina cyanea) Eucalyptus Zone
- Weeping Grass (*Microleana stipoides*) Eucalyptus Zone

⁴ As per NSW Department Primary Industries and Environment eSpade data https://www.environment.nsw.gov.au/eSpade2Webapp

- Kidney Weed (*Dichondra repens*) Eucalyptus Zone
- Tussock grass (Poa labillardieri) Eucalyptus Zone
- Bushy Hedgehog-grass (Echinopogon caespitosus) Eucalyptus Zone
- Native Geranium (Geranium homeanum) Eucalyptus Zone
- Basket Grass (Oplosmenus hirtellus) Eucalyptus and Rainforest Zone

Additionally, Blue Flax-lilly (*Dianella longifolia*) seedlings can be included for planting within the Eucalyptus Zone for sediment and erosion control, whilst contributing to groundcover diversity.

A seed purity, providence and viability certification must be supplied by the revegetation contractor to Energy Australia and verified prior to seeding commencing. This certification must be included in the first site monitoring report.

This groundcover mix should also be considered for use in groundcover stabilisation and rehabilitation associated with Tallawarra B construction and all early works activities.

3.12 Planting

3.12.1 Plant sourcing

Where possible, plants should be sourced from locally genetic material rather than sourced from outside of the Illawarra region. Local suppliers such as Wollongong Botanic Garden GreenPlan Nursery or Jamberoo Native Nursery may be able to source such plants or alternatively seed can be collected from plants in the surrounding area (for example Mt Brown or within Tallawarra Lands area) and propagated. Native seed collection to only be conducted where a permit to pick or harm a threatened species or ecological community⁵ has been obtained, as required under Part 2 of the *Biodiversity Conservation Act 2016*.

Plant sourcing is to occur at earliest convenience as sourcing and propagating could take upwards of 18 months depending on propagation/planting methods and stock availability.

3.12.2 Planting timing

Planting is to occur only after site preparation has been completed and there is suitable soil moisture (i.e. 50mm in the last two weeks). Additionally, planting is to occur preferably in autumn where there is less likelihood of extreme temperatures occurring or alternately in late winter -early spring (if soil moisture conditions are suitable and favourable conditions are forecast (ie not during drought or drier conditions). Given the climate data for the region, the optimal months for planting in order of most preferable include March, April, May, or August and early September (if suitable soil moisture is present).

3.12.3 Planting layout

A proposed approximate planting layout is shown in Figure 3-6. This planting layout has considered planting in rows at a spacing of 3m between trees and 3m between rows. Rows have been chosen to follow along the 2m contour line of the site (ie across the slope not downslope), as is best practice in revegetation projects.

The current planting layout is designed for approximately 1,300 planting points for trees, which leaves approximately 471 plantings remaining. It is recommended that these extra ~471 plantings consist of shrub planted randomly in between the 3-metre tree spacings to help develop the understorey shrub layer whilst outcompeting pasture weeds/grasses. Additionally, some species (such as *Acacias*) provide additional nutrients that will assist in the growth of surrounding species such as through nitrogen fixing. Suitable shrub species for this purpose include:

Rainforest zone

⁵ For further details see: https://www.environment.nsw.gov.au/licences-and-permits/wildlife-licences/licencesto-controlor-harm/licences-to-harm-threatened-species

- Coffee Bush (Breynia oblonifolia)
- Maidens Wattle (Acacia Maidenii)
- Black Wattle (Acacia mearnsii)
- Native Cascarilla (Croton verreauxii)
- Eucalypt Zone
 - Two-veined Hickory (*Acacia binervata*)
 - Sickle Wattle (Acacia falcata)
 - Blackwood (Acacia melanoxylon)
 - White Feather Honey-myrtle (Melaleuca decora).

3.12.4 Planting method – long-stem planting

Long stick planting has shown success in achieving successful plant establishment, particularly along riparian zones where long stems are closer to permanent water (Rutherford et al., 2000; APS, 2010). Benefits of this method include:

- Seedlings are older and stronger at time of planting due to longer nursery period
- Deeply rooted soil ball is better insulated against changes in soil moisture and temperature. Therefore, mulch is not usually necessary.
- Seedlings are more stable once planted due to greater area of root binding. Protects against wind and soil/flood erosion
- No further watering or fertiliser is required once planted
- More difficult to pull out of ground, which may assist in the event livestock of other factors access the areas and attempt to pull out the seedlings.
- Extensive ripping of the soil and weeds is not normally required
- Protects against competition from invasive weeds

The key downside to this approach is that plants need to be grown in pots within a nursery environment for a period of 10 to 18 months. However, given the limited ongoing maintenance requirements, and the benefits which result in a greater survival rate, long-stem planting is considered to be the most appropriate planting method for the offset site.

This method does not require extensive ripping or tilling of the ground, and instead only requires auguring at individual planting sites. As the site has heavy clay soil, the use of a power tools such as a soil augur may result in the walls of the planting hole to be too smooth and thus restricting root penetration (APS, 2010). If this issue arises, then hole walls will need to be roughened slightly before planting of the tube stock.

Generally, for this method the deeper the planting hole is the better. As such depth of each hole is to be approximately 0.6 to 1 metre (dependent upon the height of each species at the time of planting). However, holes are to be shallower in the event the water table is reached, so as to not drown the plant.

For some species, the use of long-stem planting may not be practical from a supplier perspective or may not be effective (Long-stem planting is generally more effective with species that can propagate from cuttings). In these cases, the use of tube stock may be required. This is to be avoided where possible as the use of two separate planting methods will result in different maintenance regimes. As such this method is to be reserved to small shrubs which have a greater likelihood of establishment.

3.12.5 Tree guard installation

Although the benefits Long-stem generally reduce the need for tree guards, they will still provide protection against exotic herbivores such as cattle (*Bos taurus*) if they breach the exclusion fencing, and rabbits (*Oryctolagus cuniculus*) which are known to occur in the area. Furthermore, guards will provide additional

protection from wind, moisture stress and accidental damage during slashing. As such, given the increase of survival rates at a relatively low cost they are mandatory for this offset site.

It is recommended that corflute guards be used as they are a low cost but highly effect waterproof and UV stabilised guard that will unlikely need replacing during the establishment period. The use of two stakes per plantings will provide additionally stability to the guards and lower the likelihood of guards being dislodged (e.g. during high wind events).

3.12.6 Mulching

Mulch is not considered necessary for the offset site, especially if using tree guards and the Long-stem planting method which provides similar benefits of mulch through its deep planting of the root system. Additionally, issues of mould and rot may arise if mulch has consistent contact with woody stem of deep planted trees.

3.13 Fertilisation

Plant along with native tree fertiliser tablet for each tree/shrub planted to increase success rate of planting. As the long-stem planting method will be used, additional fertilisation is unlikely to be required unless further monitoring identifies areas poor growth.

3.14 Watering

At the time of planting each tree/shrub planted using the long-stem planting method will require at least two litres of water (more will be required if the subsoil is dry as per APS, 2020). Use of the long-stem planting method will negate the need for further watering except for during the extreme drought or extended heatwave conditions.

Any tube stock planted will need at least ten litres per tube stock in two five litre applications. Watering will need to occur once a week for a minimum of four weeks unless sufficient rain (over 50mm) has fallen within the preceding week.

3.15 Monitoring points

The use of traditional photo points in combination with aerial imagery monitoring of the offset area will be used to provide key snapshots of planting success. A six monthly to yearly interval (as specified in Table 4-1) would allow for the identification of canopy/understorey growth over time and tracking overall project success.

At least six on ground photo points are to be utilised (three within each zone) with photos taken from both outside and within the offset area. The locations of these photo points are to be determined at the time of planting and marked via GPS coordinates and a stake. Photos at these points are to be taken from the same location and orientation at each monitoring event to provide consistency and easy visualisation of change over time.

The use of aerial imagery in conjunction with on ground photo points will also assist in the mapping of longterm landscape change (i.e. if growth in vegetated areas is occurring) in an efficient manner. Preferably aerial/satellite imagery should be obtained from the one source to minimise variance associated with differences in photogrammetry technologies.

Additionally, general site walkovers should occur during monitoring periods with GPS tagged photographs of key features (i.e. areas of failure or areas of substantial growth) that would not otherwise be captured from stationary photo points.

4 Monitoring and maintenance

4.1 Weed and grass control

Spot spaying for weed and competing grass species will occur bi-annually for the first two years following compensatory plantings, then then every year.

A weed ground cover percentage of under 8% within proposed 1 metre planting rows should be considered an acceptable threshold. This allows for germination weed seed stock which may be present in the existing topsoil and seed imported through natural processes.

Given the exclusion fencing will prevent cattle from grazing grasses within the offset site, native and nonnative groundcovers/ grasses between plantings may grow and raise fuel levels creating a fire hazard. As such regular inter-row mechanical slashing of natives and spot spraying of weeds should be conducted to keep fuel levels down until the tree canopy grows to provide sufficient shading that understorey grasses growth is limited. Any spraying or slashing activities will need to avoid damaging plantings.

4.2 Replacement planting

If plant losses of greater than 20% occur within the first 12 month period following plantings, then replanting will occur to achieve the required offset planting quota.

4.3 Monitoring works

Bi-annual monitoring will occur for the first two years following initial planting works. Annual monitoring will occur for the following third, fourth and fifth year following.

Monitoring will include but no be limited to:

- Number of plant stock survival/failure
- Health of plantings
- Percentage foliage cover
- Evidence and degree of native species recruitment
- Degree of predation by herbivores
- Quality of topsoil and moisture levels
- List of weed and grass species present
- Species list of non-planted native recruitment
- Density of weeds to natives
- Photographs taken at predefined photo point locations, and general GPS tagged photographs of key findings during site walkover
- Presence/absence of erosion
- Damage to fencing or evidence of failure to contain livestock permanently.
- Remove any tree guards (if used) once trees/shrubs are twice the height of the guard
- Maintenance and monitoring of any installed habitat sites such as nest boxes
- Review and storage of most recent aerial/satellite imagery of the site

An example monitoring checklist template has been provided in Appendix C to enable the above works are completed.

A short report outlining the findings of these monitoring events should be prepared and used to identify any corrective actions that are required.

4.4 Summary of establishment, monitoring and maintenance measures

A summary of establishment, monitoring and maintenance measures required for the successful establishment of the offset site is provided in Table 4-1. Frequency of monitoring and maintenance events have been considered in accordance with expected maintenance requirements of the long-stem planting method. However, frequency of monitoring and maintenance events can be increased if proposed schedule is found to not be achieving desired performance measures.

Timing	Action
Up to 18 months prior to	Plant sourcing:
site preparation	Engage native plant supplier to begin propagation of native seedlings.
Week one – Site	Signage:
preparation	Erect 'restricted access' signage at offsetting site
	Fencing:
	 Erect livestock exclusion fencing around each planting area
	Weed and grass control:
	 Slash and spot spray for weeds and grasses in a strip along proposed planting contour line (Note: spraying must occur approximately 7 days after rains of over 20 mm or when new growth of at least 50 mm is obvious)
	Monitoring:
	 Review and store most recent aerial/satellite imagery of the site.
	 Damage to fencing or evidence of failure to contain livestock
	 Quality of topsoil and moisture levels
Week four - Planting	Erosion and sediment:
(Not within 21 days following weed control)	Erect sediment fencing on the downward side slope at each planting area if significance soil disturbance occurs during planting
	Monitoring:
	 Monitoring works requirements as detail in Section 4.3
	Long-stem planting:
	Conduct planting at offset site location
	Fertiliser:
	Apply a slow release native fertiliser tablet for each tree/shrub planted
	Watering (if conditions require):

Water at least 2L per long stem planted tree/shrub

Water at least 10L per tube stock in two separate 5L applications

Table 4-1 Summary of establishment, monitoring and maintenance measures

Site establishment complete

Timing	Action					
Month One to three	Watering (if conditions require):					
	 Monthly follow up watering if insufficient rainfall occurs (<100mm over a period of four weeks) or insufficient soil moisture 					
Six months following site	Weed and grass control:					
establishment	Spot spraying and slashing as required. Accepted weed threshold <8%					
	Replacement planting:					
	Replace failed plantings if >20% of plantings fail					
	Monitoring:					
	 Monitoring works requirements as detail in Section 4.3 					
12, 18 and 24 months	Weed and grass control:					
establishment	Spot spraying and slashing as required. Accepted weed threshold <8%					
	Replacement planting:					
	Replace failed plantings if >20% of plantings fail (18 months after establishment)					
	Monitoring:					
	 Monitoring works requirements as detail in Section 4.3 					
3, 4 and 5 years following	Weed control:					
site establishment	Spot spraying as required. Accepted weed threshold <8%					
	Monitoring:					
	 Monitoring works requirements as detail in Section 4.3 					
5 years following site	Final assessment:					
establishment	A biological assessment is to be undertaken to determine if the compensatory planting areas are self-recruiting and viable. If so current monitoring and maintenance schedule can cease. If not found to be self-recruiting and viable, monitoring and maintenance works to continue annually until evidence of complete establishment native canopy species is evident and system is viable.					
Annually from 6 years	Weed control:					
onwards in perpetuity	Yearly spot spraying and slashing as required. Accepted weed threshold <8%					
	Conservation:					
	 Continued protection of offset area in perpetuity. No clearing of this land is to occur without additional approvals and assessment. 					

5 Performance requirements and corrective actions

To enable the intent of this Offset Plan to be met, a number of performance requirements and corrective actions have been developed (refer to Table 5-1).

Table 5-	1 Rehabilitation	objects	and	nerformance	critoria
Table 5-	i Renabilitation	objects	anu	performance	cillena

Performance requirements	Acceptable solution	Corrective Action	Timing
Foliage cover to be increasing at each monitoring event until the following approximate benchmarks are achieved at maturity: Rainforest Zone 50% Tree foliage cover 75% Shrub foliage cover Eucalypt Zone 50% Tree foliage cover 20% Shrub foliage cover	Must meet performance requirement except in times of extreme environmental stress which may affect performance (i.e. major drought conditions)	Direct planting at rates great enough to achieve desired densities. Direct plantings to meet desired rates may be postponed in times of extreme environmental stress (e.g. major drought conditions) where conditions may not be conducive to the survival of new plantings.	Planting as part of initial planting works Foliage cover to be recorded during each monitoring event.
Survival rate of planted trees to be >80% (i.e > 1290 plantings)	Must meet performance requirement	Analysis of failure to occur (E.g. unsuitable species planted, extreme weather event, weed out competition, pest incursion) Additional planting to occur if planting mortality >20% in accordance with failure analysis	Survival rates to be determined at each monitoring event.
No sediment deposition into Yallah Creek	Sediment fencing only to be removed once topsoil is stabilised by native groundcover.	Sediment fences and other erosion control measures put in place and maintained as required	During site preparation. Sediment fencing to be inspected at each monitoring event and removed once monitoring event identifies stabilised topsoil.
Suitable number of flora species planted and expected to self-seed within required time frames.	Must meet performance requirement	Direct planting at rates great enough to achieve desired densities Control of weed species to reduce competition for native species	Planting as part of initial planting works Weed species to be controlled in perpetuity

Performance requirements	Acceptable solution	Corrective Action	Timing
No incidence of undesirable livestock incursion	Installation of livestock fencing	Livestock exclusion fencing to be maintained as required	Installation of fencing prior to or during site preparation Monitoring of fence line or evidence undesirable livestock incursion Maintenance of fencing in perpetuity
Installed habitat sites (e.g. nest/roost boxes) to be suitable for native species	Evidence of native species usage of habitat site Habitat site to be well maintained and free of pest species	Maintenance/repair of habitat sites as required Continued monitoring for native species usage throughout monitoring period	Installation during site preparation works Monitoring to occur during each monitoring event
Contiguous riparian zone is developed along Yallah Creek, connecting fragmented patches of <i>Illawarra Subtropical</i> <i>Rainforest</i> TEC	Planting of rainforest zone within chosen offset site location	Direct planting at rates great enough to achieve desired densities Control of weed species to reduce competition for native species	Planting as part of initial planting works Weed species to be controlled in perpetuity Fragmentation to rainforest patches to be monitored via aerial imagery during each monitoring event

6 References

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Appendix A Native vegetation identified for removal

Species	Construction Ancillary Site 1	Construction Ancillary Site 2	Construction Ancillary Site 3	Construction Ancillary Site 4	Construction Ancillary Site 5	Tallawarra B Gas Receival Station	Switchyard Carpark	Tallawarra B Power Station	Transmission Line Easement
Eucalypts, Anophoras and Corymbias									
Forest Red Gum (Eucalyptus tereticornis)	181								
Red bloodwood (Corymbia gummifera)									
Coastal Grey Box (Eucalytpus bosistoana)	63								
Sydney Red Gum (Angophora costata)									4
Stringybark (Eucalyptus eugenioides)	9								
Swamp Mahogany (Eucalyptus robusta)	16								
Blackbutt (Eucalyptus pilularis)									
Grey Gum (Eucalyptus punctata)		3							3
Juvenile Eucalyptus (Possibly Grey Gum)									1
Spotted Gum (Corymbia maculata)									21
Tallowwood (Eucalyptus microcorys)									1
Bangalay (Eucalytpus botryoides)									1
Eucalyptus sp.									7
Acacias									
Sydney Golden Wattle (Acacia longifolia)	6			14			10		
Sickle Wattle (Acacia falcata)				4			4		
Sydney Green Wattle (Acacia parramentensis)				2					
Black wattle (Acacia mearnsii)				2			2		22
Sweet Wattle (Acacia suaveolens)				1					
Coastal Wattle (Acacia Binerva)									2
Acacia Sp. (Exact species unknown as access issue required survey from distance)									3
Melaleucas, Callisetmons and leptospermum									
Prickly-Leaved Paperbark (Melaleuca styphelioides)	113								
Willow Bottlebrush (Callistemon salignus)	16	2							2
Snow in Summer (Melaleauca linariifolia)	52								1
Tea Tree (Leptospermum sp)	15								1
Casuarina and Exocarpus									
Swamp Oak (Casuarina glauca)	6								16

Species	Construction Ancillary Site 1	Construction Ancillary Site 2	Construction Ancillary Site 3	Construction Ancillary Site 4	Construction Ancillary Site 5	Tallawarra B Gas Receival Station	Switchyard Carpark	Tallawarra B Power Station	Transmission Line Easement
Native Cherry (Exocarpos cupressiformis)				1					20
Other									
Small leaved Lilly Pilly (Syzygium luehmannii)									1
Waterhousia (Waterhousia floribunda)									1
Tuckeroo (Cupanioppsis anacardioides)									2
Fig Sp. (Juvenile)									1
Rusty Fig (Ficus rubiginosa)									1
Water Gum (Tristaniopsis laurina)									2
Brush Box (Lophostemon confertus)									3
Sweet Pittosporum (Pittosporum undulatum)	5								2
Bottletree (Brachychiton rupestris)									1
Brush Cherry (Syzygium australe)									1
Silky Oak (Grevillia robusta)									2
Unidentified presumed native species	7	9	20	13	32	8		16	38
Area total	502	14	20	37	32	8	16	16	160
Total	805								

Appendix B Site Planting List⁶

Species	Recommended planting location zone	Justification for use	Habitat values
Whalebone tree (<i>Streblus</i> <i>brunonianus</i>)	Rainforest riparian zone – Overstorey tree	 Slow growing, but able to self-seed upon establishment Species is a key species amongst adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Is present along Yallah creek so known to be able to survive local conditions Able survive windblown slopes, such as those present along Mount Brown 	Produces fruit that is popular with numerous b
Guioa (<i>Guioa</i> semiglauca)	Rainforest riparian zone – mid-storey tree	 Associated with adjacent rainforest located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Recommended as useful for regenerating former rainforest sites, particularly due to its adaptability to a range of environments including amongst sclerophyll rainforest environments 	Dense canopy produces suitable nesting sites
Brush Wilga (<i>Geijera salicifolia</i>)	Rainforest riparian zone – Exposed outer edges of the rainforest	 Known to occur in close association with Whalebone tree within the surrounding Mt Brown area. Can tolerate drier conditions more than most rainforest species <i>Note:</i> Propagation from seed may be slow and unreliable. Additionally deer are highly attracted to the species and may kill the tree by rubbing of antlers along the trunk. 	 Flowers attract insects and insect eating birds Produces fruits that are consumed by a wide
Native Quince (<i>Alectryon</i> subcinereus	Rainforest riparian zone – Understorey shrub/Overstorey tree	 Highly adaptable plant that is able to grow along riparian corridor Species is a key species amongst adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Will grow either as canopy species or an understorey rainforest species 	 Fruits are eaten by bird species such as Gree
Red Ash (<i>Alphitonia</i> <i>excelsa</i>)	Rainforest tree – intergrading plant between eucalypt and rainforest zones	 Associated with target rainforest community PCT 1300 Present in surrounding region such as Mt Brown Slow growing species, but it is a tough and hardy rainforest species that can withstand dry periods 	 Fruits are eaten by a wide range of bird specie Provides nectar which is consumed by flying f Produces shade and shelter for a range of fau Larval food plant for the Small Green-banded
Coffee Bush (<i>Breynia</i> <i>oblonifolia</i>)	Rainforest riparian zone and eucalypt zone – Understorey shrub	 Widespread and regenerates readily so is useful for sites without rainforest vegetation already present. Grows well as an understorey species and is suitable for shrub planting alongside larger trees. 	Produces fruit that is eaten by a range of bird
Grey Myrtle (Backhousia myrtifolia)	Rainforest riparian zone – Understorey shrub	 Associated with adjacent rainforest located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Useful for bush regeneration of rainforest creeks within the coastal plain 	Provides suitable habitat for small bird specie
Maiden's Wattle (<i>Acacia maidenii</i>)	Outer edge of Rainforest riparian zone – Overstorey tree. Eucalypt zone – Understorey tree	 Pioneering plant able to grow fast fix nitrogen and adapt to disturbed soil environments Species is a key species amongst adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Does not grow in marshy boggy conditions, so would be suitable for planting along the outer edge the rainforest riparian zone 	 Leaves a food source for a several native butt Attracts seed eating and insectivorous birds s
Cockspur Thorn (<i>Maclura</i> cochinchinensis)	Rainforest understorey shrub/climber Note: This species is to be planted sparingly due to possibility of overgrowing and limiting access for weed maintenance purposes	 Associated with target rainforest community PCT 1300 Present within surrounding areas such as Mount Brown Fast growing species that may assist in deterring larger unwanted animals such as deer and cattle due to large thorns 	 Provides suitable replacement habitat for sma or blackberry, which will be removed as part of Fruits are eaten by small birds and Flying Fox

bird species

s for a range of bird species which also feed on fruits.

range of native bird species.

en Catbird (Ailuroedus crassirostris)

ies

foxes

iuna

Blue Butterfly (Psychonotis caelius)

species.

es who utilises the bushy habit of the shrub

tterfly species

such as the King Parrot

all bird species who may utilise invasive scramblers such as lantana of weed management procedures throughout the area. xes

⁶ Note: Plant species habitat values and environmental preferences provided as per https://finder.growingillawarranatives.org/plants/finder. the local area, as identified within http://www.irbd.com.au/

Species	Recommended planting location zone	Justification for use	Habitat values
Black wattle (<i>Acacia mearnsii</i>)	Rainforest zone – Understorey tree	 Pioneering plant able to grow fast fix nitrogen and adapt to disturbed soil environments Replaces the up to 38 individuals lost during clearing Associated with adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Useful as a screen or windbreak for small and more sensitive species 	 Cockatoos eat grubs within the bark Produces sap that sugar gliders feed on Flowers attract Two-spotted Line-blue butterfly
Two-veined Hickory (<i>Acacia</i> <i>binervata</i>)	Eucalypt Zone – Understorey tree	 Fast growing and short-lived pioneer species that grows well within a sclerophyll forest and along the edges of rainforests 	 Larval plant for butterfly species Gum/sap accretions attracts sugar gliders Attracts seed eating birds and insects
Blackwood (<i>Acacia</i> <i>melanoxylon</i>)	Eucalypt Zone – Understorey tree	 Useful for bush regeneration within riparian and degraded areas Grows quickly and moderately long-lived Dead wood breaks down in the soil, providing nitrogen for adjacent plant species to utilise 	Seeds are eaten by parrot speciesLarval food plant for butterfly species
Sickle Wattle (<i>Acaica falcata</i>)	Eucalypt Zone – Understorey shrub	 Useful stabilising shrub Replaces the 117 individuals lost during clearing Fast-growing short-lived plant that can be used as a pioneer species. 	Food plant for a range of butterfly and insect s
Prickly-leaved paperbark (<i>Melaleuca</i> <i>styphelioides</i>)	Rainforest riparian and Eucalypt zone – Understorey tree/Shrub	 Grows well in association with eucalypt species such as Forest Red Gum (<i>Eucalyptus tereticornis</i>) and Woollybutt (<i>Eucalyptus longifolia</i>) Will replace the 127 individuals lost during clearing Large examples of the species are already present at the offset site, showing suitability for environmental conditions 	Attracts nectar eating birds and butterflies, and
White Feather Honey-myrtle (<i>Melaleuca</i> <i>decora</i>)	Eucalypt zone – Understorey shrub/small tree	 Grows well with eucalypt species such as Forest Red Gum (<i>Eucalyptus tereticornis</i>) and Woollybutt (<i>Eucalyptus longifolia</i>) Suitable for heavy clay soils on coastal plain 	 Produces nectar for flying foxes, birds and inse Bark produces cracks and crevices for small fa
Native Cascarilla (Croton verreauxii)	Rainforest riparian zone – Understorey shrub	 Useful pioneering shrub for regenerating rainforests, particularly at the integrate with between rainforest and sclerophyll eucalypt communities. Associated with adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community 	Produces fruit that is eaten by a range of bird s
Hairy Clerodendrum (<i>Clerodendrum</i> tomentosum)	Intergrading between rainforest riparian zone and Eucalypt zone – Understorey shrub	 Associated with adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community Hardy plant useful for growing at the rainforest edge. Able to survive drought conditions and major root disturbance 	 Larval butterfly food plant Produces fruits eaten by bird species such as
Forest Red Gum (Eucalyptus tereticornis)	Eucalypt zone	Suitable tree for most bush revegetation projectsIdeal to replace the over 180 species lost as part of the clearing	 Provides typical eucalypt habitat such as seed produces nectar used by parrots, honey eaters
Woolybutt (<i>Eucalyptus</i> <i>longifolia</i>)	Eucalypt zone	 Identified as useful for bush regeneration projects on the coastal plain particularly alongside other Eucalypts Grows in a range of soil types but prefers clay soils 	 Provides typical eucalypt habitat such as seed produces nectar used by parrots, honey eaters
Thin-leaved Stringybark (<i>Eucalyptus</i> <i>eugenoides</i>)	Eucalypt zone	 Suitable for bush regeneration as it grows well in a range of soil types (from well drained loamy soils to poorly drained floodplains) Grows well in association with other species such as Forest Red Gum (<i>Eucalyptus tereticornis</i>). Woollybutt (<i>Eucalyptus longifolia</i>) and White Feather Honey-myrtle (<i>Melaleuca decora</i>) 	 Provides typical eucalypt habitat such as seed produces nectar used by parrots, honey eaters Stringybark provides cracks and crevices for s
White Stringybark (<i>Eucalyptus</i> <i>globoidea</i>)	Eucalypt Zone	 Key species of target plant community PCT 1326 Grows well in mixed eucalypt plantings particularly alongside Forest Red Gum (<i>Eucalyptus tereticornis</i>). Woollybutt (<i>Eucalyptus longifolia</i>) and White Feather Honey-myrtle (<i>Melaleuca decora</i>) Known to grow in the surrounding Yallah region 	 Provides typical eucalypt habitat such as seed produces nectar used by parrots, honey eaters Stringybark provides cracks and crevices for s

(Nacaduba biocellata)

species.

d produces seeds for seed eating birds

sects.

auna such as insects

species.

the Satin Bowerbird (Ptilonorhynchus violaceus)

ds, bird roosting sites and potential for developing hollows. Also s and insects.

ds, bird roosting sites and potential for developing hollows. Also rs and insects.

ds, bird roosting sites and potential for developing hollows. Also s and insects.

small fauna species.

ds, bird roosting sites and potential for developing hollows. Also rs and insects.

small fauna species.

Species	Recommended planting location zone	Justification for use	Habitat values
Swamp Mahogany (<i>Eucalyptus</i> <i>robusta</i>)	Eucalyptus Zone	 Fast growing species that is able to grow in swampy waterlogged soils on the coast. Grows well in association with other Eucalypt species such as Forest Red Gum (<i>Eucalyptus tereticornis</i>) and Woolybutt (<i>Eucalyptus longifolia</i>) 	 Winter flowering species providing nectar for fa
Coastal Grey Box (<i>Eucalyptus</i> <i>bosistoana</i>)	Eucalyptus Zone	 Grows well in association with other Eucalypt species such as Forest Red Gum (<i>Eucalyptus tereticornis</i>) and Woolybutt (<i>Eucalyptus longifolia</i>) Fast growing species suitable for the coastal plain Replaces the up to 63 individuals which may be cleared during early works 	Provides typical eucalypt habitat such as seeds produces nectar used by parrots, honey eaters
Mutton Wood (<i>Myrsine variabilis</i>)	Eucalyptus Zone	 Associated with target plant community PCT 838 Suitable for bush regeneration projects due to resilient nature Known to be present in the surrounding Mt Brown region 	Attracts birds such as the Lewin's HoneyeaterLarval food plant for the White-banded Line-blu

una such as the Swift Parrot and the Grey-headed Flying Fox

s, bird roosting sites and potential for developing hollows. Also and insects.

e Butterfly (*Nacaduba kurava*)

Appendix C Monitoring checklist template

Monitoring Point #				Recorder	
Vegetation Zone	Eucaly Rainfo	ypt/ prest		Date	
Inspection Items	Yes	No	N/A	Comments	Required action (if necessary)
Photograph from photo point taken?					
List of general comments as identified from photo point.					
Evidence of planting failure?					
Count by species of failed plants.					
Are the plantings healthy? Signs of disease/stress					
Area foliage cover Area (m^2) of total foliage cover					
Area (m ²) of tree foliage cover					
Is there evidence of native species recruitment?					
Provide count of native species seedlings.					
Evidence of predation by herbivores? Count and list of species affected Possible herbivore (Rabbit, Cow, Deer, Wallaby, other)					

Monitoring Point #				Recorder	
Vegetation Zone	Eucaly Rainfo	/pt/ prest		Date	
Inspection Items	Yes	No	N/A	Comments	Required action (if necessary)
Quality of topsoil					
Evidence of erosion. Any sediment flow into Yallah Creek					
Soil moisture level (wet to dry as per selected moisture probe scale)					
Are weed species present?					
List weeds species present					
Density of weed species to natives					
Ratio of weed species to natives in a 10m x 10m plot					
Evidence of livestock incursion?					
Cattle or evidence of cattle such as footprints and scat within the offset area?					
Fence in good condition and in no need of repair?					
Have tree guards been removed (if necessary)?					
Have any installed nest boxes been monitored?					
Signs of disrepair?					
Evidence of usage by native species?					
Presence of invasive/pest species?					
Has most recent satellite imagery of the offset site been reviewed?					

Appendix D Agency Consultation Log

Agency	Date	Method	Actions and responses
Biodiversity and Conservation Division (BCD)	27-08-2021 to 30-08- 2021	Email	 Email sent to BCD seeking consultation contacts and teleconference meeting Response from Vanessa Allen (Senior Conservation Planning Officer) stating that they would be happy to review flora and fauna management reports Offset Plan and Flora and Fauna management Plan provided to BCD for review prior to teleconference meeting.
Biodiversity and Conservation Division (BCD)	06-09-2021	Teleconference	 Teleconference with BCD discussing: Overview of the Tallawarra B Power Station Project Overview of the proposed environmental management framework for construction Overview of the planning approval conditions relevant to BCS Discussion on FFMP, general management procedures and offsets. Next steps
Biodiversity and Conservation Division (BCD)	09-09-2021	Email – Written comments received	 Written comments received from Vanessa Allen. Overall the proposed actions within the offset plan has been supported following update of the report as per BCD comments. Consultation comments/issues outlined below: Comment: Further information on measures for encouraging the natural regeneration of locally native vegetation, including weed management, in accordance with CoA 3.41(a) is required. The Offset Plan only addresses weed management for the Yallah Creek offset area prior to planting. Existing native vegetation to be retained within the site could also benefit from weed management, particularly given disturbance resulting from new works will occur. These areas should be identified in the Offset Plan, including details on how weed management will be achieved to meet CoA 3.41 (particularly a,d,e,f). Response: Report has been updated to reflect this, particularly with the inclusion of Section 2.5 Comment: Species list for replanting. Species list should be expanded. Use species inventory from Mount Brown as guide. Provide list as a reference in Appendix. Refer to http://www.irbd.com.au/ for nearby species lists. Response: Species planting list has been moved to Appendix B and additional species have been added including Brush Wilga, Red Ash, Grey Myrtle, Cockspur thorn, Hairy Cleodendrum, Swamp Mahogany, Coastal Grey Box, Mutton Wood. Additionally have added Kidney Weed and Tussock Grass to groundcover seeding suggestion. Have added further details regarding the absence of more groundcover/vine species within Section 3.5 Comment: The Report states that seeds may be sourced from nearby vegetation at Mount Brown. Please be aware that a Biodiversity Conservation Licence is required for this. Refer to https://www.environment.sys.

permits/wildlife-licences/licences-to-controlor- harm/licences-to- harm-threatened-species — Response: Added the requirement for licence
 Comment: The document states that traditional permanent photo points are unlikely to be effective given the size and shape of the area. We disagree and consider these should be included.
 Response: Requirement for traditional photo points has been added
 Comment: Replacement plantings occur if losses greater than 20% within 6 months. This should be increased to 12 months to ensure plants get through at least one summer.
 Response: Increased period from 6 months to 12 months as required.

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