



# TRAVERS BUSHFIRE & ECOLOGY

A TBE ENVIRONMENTAL COMPANY



## BUSHFIRE PROTECTION ASSESSMENT

Proposed Warriewood Nursery

Lot 3 & 4, DP26902

10-12 Boondah Road

Warriewood

Under Section 4.14 of the EP&A Act

6 June 2024

(REF: HEN09BF)



# BUSHFIRE PROTECTION ASSESSMENT

Proposed Warriewood Nursery Development  
 10-12 Boondah Road, Warriewood (Lot 3 & 4 DP26902)

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*The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features is to be confirmed by a registered surveyor.*

## EXECUTIVE SUMMARY

*Travers bushfire & ecology (TBE)* has been engaged by Henroth Investments Pty Ltd on behalf of Dan Maurici to undertake a bushfire protection assessment for the proposed Warriewood Nursery development located at 10-12 Boondah Road, Warriewood (Lot 3 & 4 DP26902). The development involves the construction of a garden centre building, parking spaces, open spaces for commercial gardens, a kid's playground, planting zones, a bio-retention basin and a conservation area.

The subject land (Lot 3 & 4 DP26902) is situated on Bush Fire Prone Land (BFPL) mapped by the Northern Beaches Council. This triggers a formal assessment by Council in respect of the NSW Rural Fire Service (RFS) policy against the provisions of *Planning for Bush Fire Protection 2019 (PBP)*.

This assessment has found that bushfire can potentially affect the proposed development from vegetation located to the north, east, south and west of the development. This has the potential to result in future buildings being exposed to potential radiant heat and ember attack.

The proposed Warriewood Nursery development must ensure that the extent of bushfire attack that can potentially impact the garden centre building envelope should not exceed a radiant heat flux of 29kW/m<sup>2</sup>. This rating assists in determining the size of the asset protection zone (APZ), which provides the necessary defendable space between vegetation that could potentially produce a bushfire and a building.

In recognition of the requirements of *PBP* and the bushfire risk posed to the site by the nearby vegetation, *TBE* propose the following combination of bushfire measures;

- APZ setbacks are required the minimum setbacks for BAL-29 and in accordance with the minimum setbacks outlined with *PBP* for most aspects as shown in section 2.5 and generally depicted in schedule 1.
- Provision of access in accordance with the acceptable solutions outlined in *PBP* and outlined within section 3.3 of this report.
- Water, electricity and gas supply in compliance with the acceptable solutions outlined in *PBP* and section 3.4 of this report.
- Future construction in compliance with *PBP* and the appropriate construction sections of AS3959-2018.
- Preparation of a Bushfire Emergency Evacuation Plan (BEEP).

## GLOSSARY OF TERMS

<b>AHIMS</b>	Aboriginal Heritage Information System
<b>APZ</b>	Asset protection zone
<b>AS1596</b>	<i>Australian Standard – The storage and handling of LP Gas</i>
<b>AS2419</b>	<i>Australian Standard – Fire hydrant installations</i>
<b>AS3745</b>	<i>Australian Standard – Planning for emergencies in facilities</i>
<b>AS3959</b>	<i>Australian Standard – Construction of buildings in bushfire-prone areas 2018</i>
<b>BAL</b>	<i>Bushfire attack level</i>
<b>BPMs</b>	Bushfire protection measures.
<b>BCA</b>	<i>Building Code of Australia</i>
<b>DA</b>	development application
<b>EP&amp;A Act</b>	<i>Environmental Planning &amp; Assessment Act 1979</i>
<b>EP&amp;A Regulation</b>	<i>Environmental Planning and Assessment Regulation 2000</i>
<b>FDI</b>	Fire danger index
<b>IPA</b>	Inner protection area
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local government area
<b>m</b>	Metres
<b>NCC</b>	<i>National Construction Code</i>
<b>PBP</b>	<i>Planning for Bush Fire Protection 2019</i>
<b>RF Act</b>	<i>Rural Fires Act 1997</i>
<b>RFS</b>	NSW Rural Fire Service
<b>Subject land</b>	Properties of 10-12 Boondah Road, Warriewood (Lot 3 & 4 DP26902)
<b>TBE</b>	<i>Travers bushfire &amp; ecology</i>

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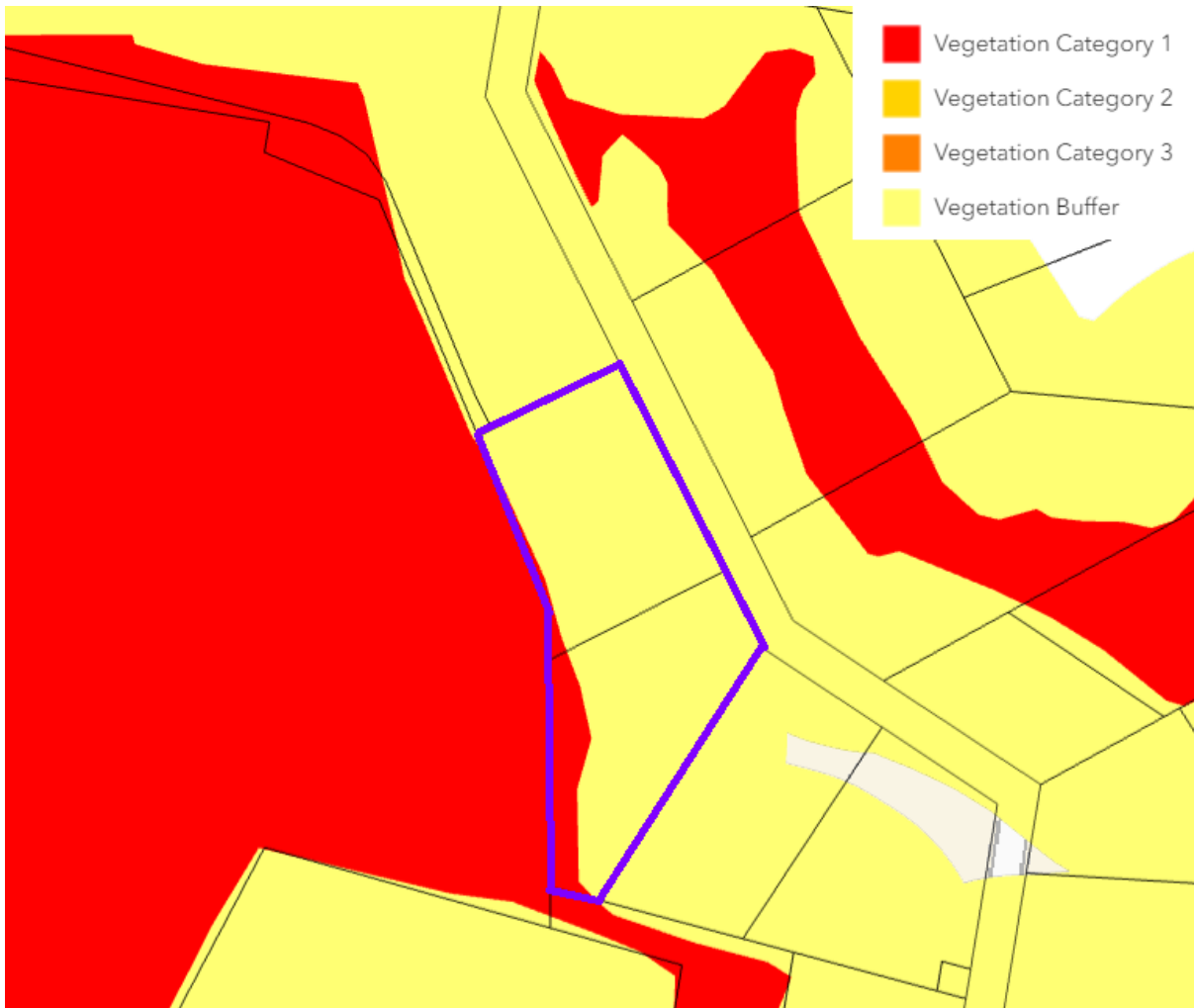
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# 1. INTRODUCTION

Travers bushfire & ecology (TBE) has been engaged by Henroth Investments Pty Ltd on behalf of Dan Maurici to undertake a bushfire protection assessment (BPA) for the proposed Warriewood Nursery development situated at 10-12 Boondah Road, Warriewood (Lot 3 & 4 DP26902). The subject land (Lot 3 & 4 DP 26902) is identified as being located on Bush Fire Prone Land (BFPL) mapped by the Northern Beaches Council. (Refer to Figure 1-1). Under section 4.14 of the EP&A Act, council is required to assess the proposed development against the provisions of *Planning for Bush Fire Protection 2019 (PBP)*.



**Figure 1-1 – Bushfire prone land map**  
(Source: NSW Planning Portal dated: 09/04/2024. Purple= subject-land)

An inspection of the subject land and surrounds was undertaken by Luke Simpson on 8 April 2024 to assess the topography, slopes, aspect, drainage, vegetation, road patterns and adjoining land use. The identification of existing bushfire measures and a visual appraisal of bushfire hazard and risk were also undertaken.

## 1.1 Aims of the assessment

The aims of the bushfire protection assessment are to:

- review the bushfire threat to the development;
- undertake a bushfire attack assessment in accordance with *PBP*,
- provide advice on mitigation measures, including the provision of asset protection zones (APZs), construction standards and other specific bushfire management issues, and;
- review the potential to carry out hazard management over the site.

## 1.2 Site description

The subject land is approximately 2.05 Ha in size and consists of two lots of land. The southern most lot situated at 10 Boondah Road, Warriewood (Lot 4 26902) has an existing residential dwelling as well as ancillary structures and paddocks for horses. (Refer to Figure 1-4). There is also a protected wetland that covers the southern corner of the subject land and its western perimeter and extends further into the adjoining land to the west. This will be discussed further in Section 1.5.

The northern neighbour situated at 71-79 Macpherson Street, Warriewood features two existing residential apartments separated by Spine Bill Drive, as well as ancillary structures, scattered debris and overgrown areas with weeds. (Refer to Figures 1-5 and 1-6).

The adjoining land to the east is the Boondah Road reserve which currently provides multiple access/ egress points to the subject land along its eastern boundary. (Refer to Figure 1-3). Further east, on the opposite side of Boondah Road are semi-rural lots with paddocks for horses, followed by bushland. The adjoining land to the south of the subject land is a semi-rural property.

In general, the subject land has a slight downslope topography in an east to west direction. (Refer to the discussion in Section 2.3).





**Figure 1-2 – Aerial appraisal**

(Source: Nearmap aerial photography, dated: 12/04/2024. Red= subject land)



**Figure 1-3 – Boondah Road east of the subject land**





Figure 1-4 – 10 Boondah Road, Warriewood (Lot 4 DP 26902)



Figure 1-5 – 12 Boondah Road, Warriewood (Lot 3 DP 26902)





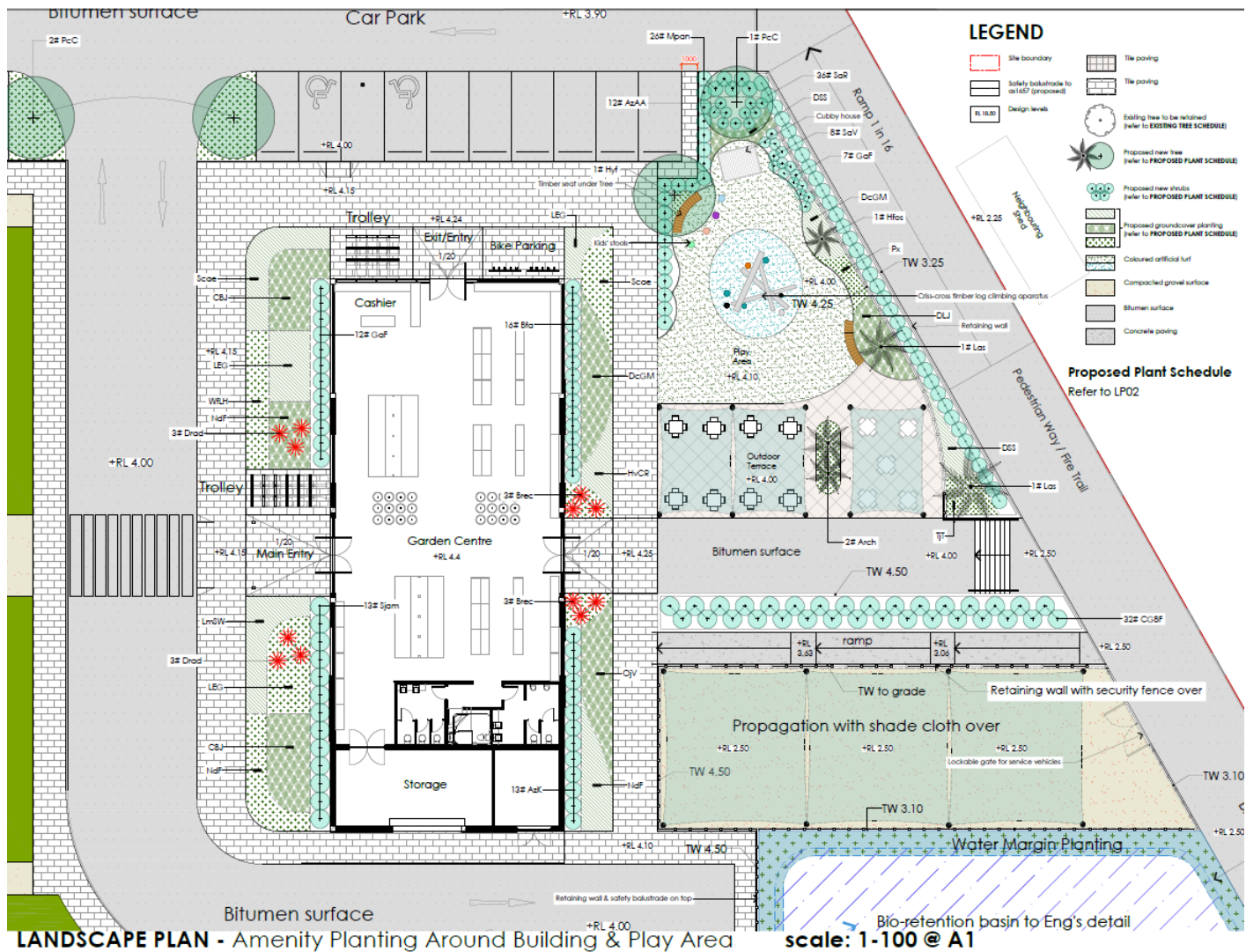
Figure 1-6 – Debris, woodpiles and overgrown weedy vegetation within 12 Boondah Road, Warriewood

### 1.3 Project description

The project will involve the construction of a plant nursery which will include a garden centre building, parking spaces, open spaces for commercial gardens, a kid’s playground, planting zones, a bio-retention basin and a conservation area. The southern section of the development will include the garden centre, tea/ coffee garden, kid’s playground, loading dock, bioretention basin and the entire southern corner consisting of the conservation area. The southern section of the site contains the garden centre which will include a carpark to accommodate fifty (50) car spaces, outdoor and play area. (Refer to Figure 1-7).

The northern section of the development will include multiple open spaces for commercial gardens which will feature a mixture of plants, herbs and an area for open events. These open spaces will be connected by compacted gravel pedestrian pathways. There will also be a Bio-diversity display area in the north section of the development. The northern, eastern and western perimeters of the subject land will be multiple planting zones; matrix planting for the north, native screen planting for the east and wetland buffer zone planting for the west. Each zone has its own planting schedule. (Refer to Figure 1-8 and Schedule 3).

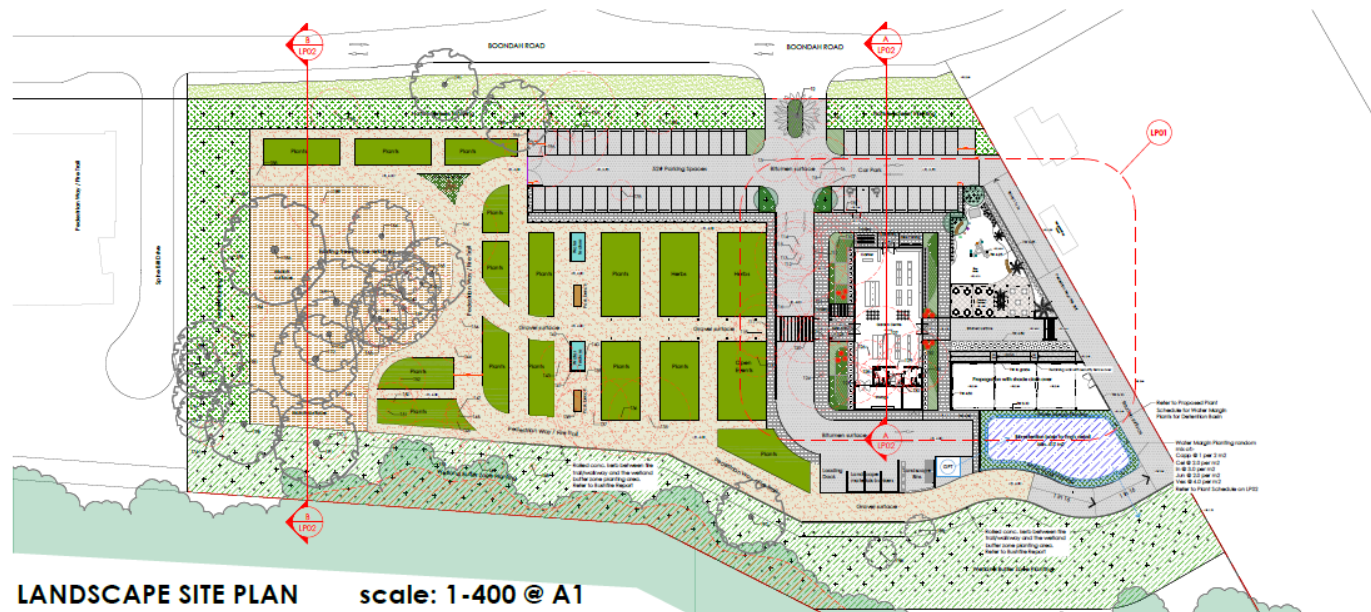
There will be one primary access/ egress point to the proposed development from Boondah Road in its southeastern corner which will connect to the development’s internal road network. The pedestrian walkway will also accommodate firefighting vehicles to access all areas around the site. This will be discussed further in Section 3.3.



**Figure 1-7 – Building and play area site plan**

(Source: John Chetham & Associates, "Proposed Nursery 10 Boondah Road, Warriewood – Landscape Plan – Amenity Planting Around Building & Play Area", rev. J, dated: 15/05/2024)





**LANDSCAPE SITE PLAN** scale: 1-400 @ A1

**LEGEND**

- Site boundary
- Existing tree to be retained (refer to EXISTING TREE SCHEDULE)
- Existing tree to be removed (refer to EXISTING TREE SCHEDULE)
- Proposed new tree (refer to PROPOSED PLANT SCHEDULE)
- Design levels
- Nominated location for bio retention basin. Subject to Eng's detail
- Nominated location for Grass Pollutant Trap. Subject to Eng's detail
- Mulch surface
- Area for placing nursery plants
- Amenity planting area
- Tile paving
- Compacted gravel surface
- Bitumen surface
- Concrete paving
- Native planting for Street Frontage, Side Boundary & Bio-diversity Planting. Refer to Matrix Planting
- Wetland Buffer Zone Planting Refer to Matrix Planting
- Water margin planting for detention basin. Refer to Proposed Plant Schedule
- Exclude new tree planting under canopies of existing trees
- Ornamental water feature
- Park bench

**Matrix Planting**

**Matrix Planting for Street Frontage & Side Boundary Planting**

**Legend for Matrix Planting**

- Woodland canopy tree species. Random mix 87-150m centres. (selected species from Native Plant Schedule above)
- Understorey shrubs & small trees. Random mix 80-135m centres. (selected species from Native Plant Schedule above)
- Ground layer: Grasses & herbs (selected species from Native Plant Schedule above)

**Matrix Planting for Wetland Buffer Zone Planting (Coastal Swamp Oak Floodplain Forest)**

**Legend for Matrix Planting**

- Woodland canopy tree species. Random mix 87-150m centres. (selected species from Wetland Bufferzone Schedule)
- Understorey shrubs & small trees. Random mix 80-135m centres. (selected species from Wetland Bufferzone Schedule)
- Ground layer: Grasses & herbs (selected species from Wetland Bufferzone Schedule)

**Figure 1-8 – Landscape site plan**

(Source: John Chetham & Associates, Landscape Site Plan, no. 10BR/LP/DA, rev. J, dated: 15/05/2024)

## 1.4 Legislation and planning instruments

### 1.4.1 Planning Overview

Is the site mapped as bushfire prone?	Yes. (Refer to Figure 1-1).
Proposed development type	Other Development- Class 5-8 <ul style="list-style-type: none"> <li>• Garden centre</li> </ul> Class 10a-b structures <ul style="list-style-type: none"> <li>• Storage sheds</li> <li>• Fences</li> </ul>
Is the development considered integrated for the purposes of Section 100B of the <i>Rural Fires Act 1997</i> ?	No. However, requires a formal assessment by council against the provisions of <i>PBP</i> under S4.14 of the <i>EP&amp;A Act</i> .
Is the proposal located in an Urban Release Area as defined under Clause 273 of the EP&A Regulations?	Yes – the subject land is a part of the southern buffer within the Warriewood Valley Release Area. (Refer to Section 1.4.1).
Zoning	RU2- Rural Landscape. (Refer to Figure 1-9).
Does the proposal rely on a performance solution?	No.

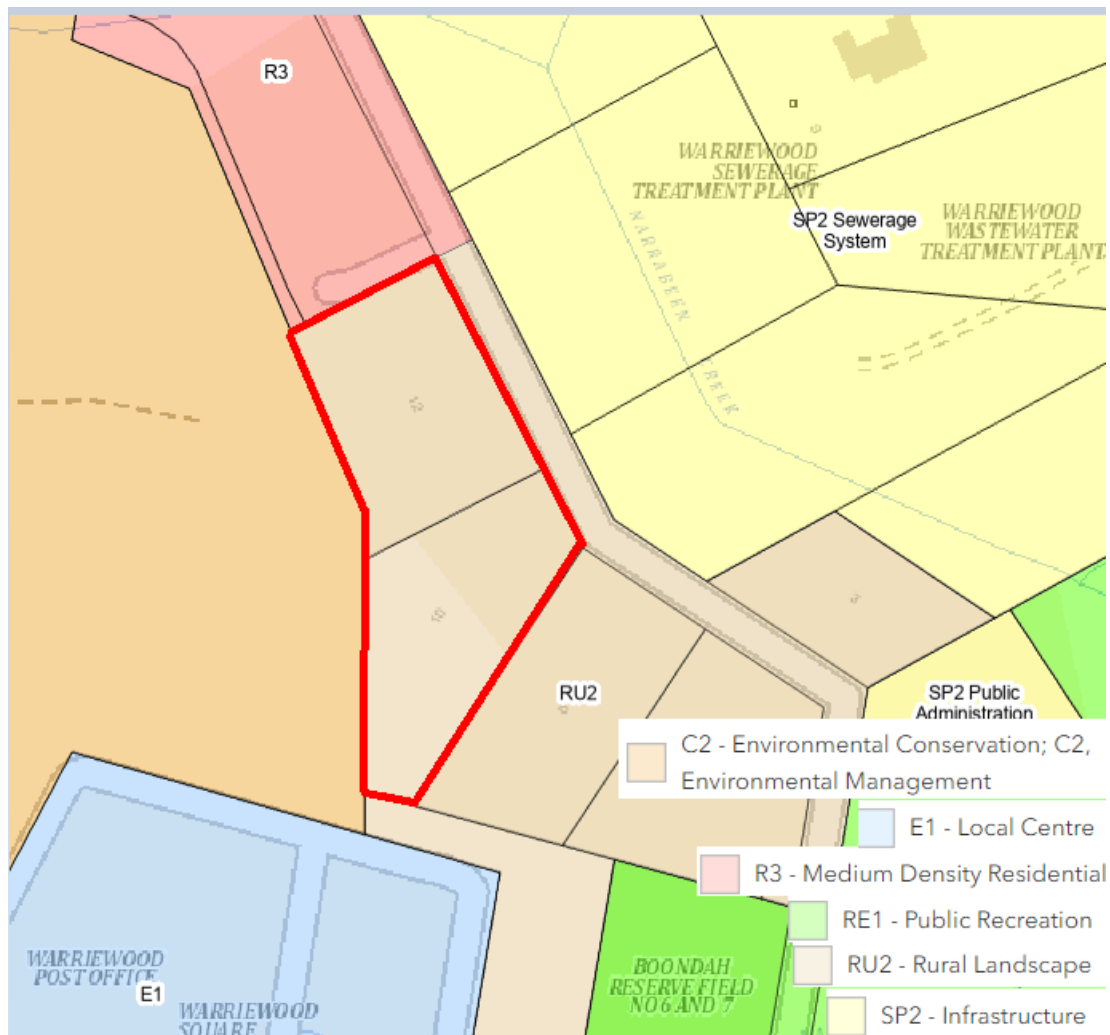
### 1.4.2 Pittwater Local Environmental Plan 2014 (Pittwater LEP)

Under the *Pittwater LEP* the subject land is currently zoned as RU2- Rural Landscape in which environmental protection works; landscape material supplies, plant nurseries, and roads are permitted with consent from council. (Refer to Figure 1-7).

The subject land is also situated within the southern buffer area of the Warriewood Release Area. As a result, development on the subject-land is subject to the Warriewood Valley Strategic Review Report and the Warriewood Valley Strategic Review Addendum Report.

Appendix 2 of the Warriewood Valley Strategic Review Addendum Report identifies both 10 & 12 Boondah Road as having bushfire and biodiversity constraints. Furthermore, the Table B: Summary of recommendations for both properties recommends the future landuse to be a recreational area land use designation for both properties. (Pittwater Council 2017).





**Figure 1-9 – Zoning**

(Source: NSW Planning Portal dated: 13/04/2024. Red= subject land)

### 1.4.3 Planning for Bush Fire Protection 2019 (PBP)

All development on BFPL must satisfy the aim and objectives of *Planning for Bush Fire Protection 2019 (PBP)*. The aim of *PBP* is to provide for the protection of human life and minimise impacts to property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

The objectives are to:

- afford buildings and their occupants protection from exposure to a bush fire;
- provide for a defensible space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- provide for ongoing management and maintenance of BPMs; and
- ensure that utility services are adequate to meet the needs of firefighters.

### **(a) Urban Release Areas (URAs)**

The NSW Government has provided for a pathway for streamlined assessment to occur under the *Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) cl.273* for new lots in Urban Release Areas (URAs) that are located on BFPL.

However, the streamlining process only allows the assessment of bush fire provisions at residential subdivision stage within URAs and may exempt residential lots from reassessment of bush fire issues when land owners are ready to develop their lots. Post-Subdivision Bush Fire Attack Level Certificates may be issued assigning BALs to all individual lots within the subdivision. An applicant can rely on this Post-Subdivision BAL Certificate for Development up to and including BAL-29.

### **(b) Buildings of Class 5 to 8 under the NCC**

Under the building classification system within the *NCC*, Classes 5 to 8 buildings include offices, shops, factories, warehouses, public car parks and other commercial and industrial facilities. (see also (d) below).

The *NCC* does not provide for any bushfire specific performance requirements for these particular classes of buildings. As such *AS 3959 Standard* is not considered as a set of deemed to satisfy provisions, however compliance with *AS 3959 Standard* must be considered when meeting the aims and objectives of *PBP*.

Whilst bushfire performance requirements are not captured by the *NCC* for class 5 to 8, the following objectives will be applied in relation to access, water supply and services, and emergency and evacuation planning:

- to provide safe access to/ from the public road system for firefighters providing property protection during a bushfire and for occupant egress for evacuation;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- to provide adequate services of water for the protection of buildings during and after the passage of bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

The general fire safety construction provisions of the *NCC* are taken as acceptable solutions however, construction requirements for bushfire protection will need to be considered on a case-by-case basis.

### **(c) Class 10 structures**

The *NCC* defines a Class 10 building as a non-habitable building or structure such as a:

- a) Class 10a – a non-habitable building being a private garage, carport, shed or the like; or
- b) Class 10b – a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like; or
- c) Class 10c – a private bush fire shelter.

There are no bush fire protection requirements for Class 10a buildings located more than 6m from a dwelling in bush fire prone areas. Where a Class 10a building is located within 6m of a dwelling it must be constructed in accordance with the requirements for that Class of building.

#### (d) Commercial and industrial development

Commercial and industrial development on BFPL is captured by *EP&A Act s4.14* where a manager's residence is included in the proposal. Where no residential component is included, commercial and industrial development is addressed through the aims and objectives of *PBP*.

A suitable package of BPMs should be proposed commensurate with the assessed level of risk to the development. The scale of the development and numbers of people likely to be occupying the building will be directly relevant to the BPMs proposed.

The provisions within Chapter 7 of *PBP* should be used as a base for the development of a package of measures. Each development will be assessed on its own individual merits.

#### (e) Commercial nurseries

In relation to commercial nurseries, *Appendix 1.10 Low threat vegetation – exclusions of PBP* states that modified landscapes, coastal wetlands and riparian areas vary significantly in structure and composition, but are generally considered as bush fire hazards, with the exception of saline wetlands. The following exclusions of *AS 3959* apply, and are not required to be considered for the purposes of *PBP*, as detailed below:

*“Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load, including grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses such as playing areas and fairways, maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens and other non-curing crops, cultivated gardens, arboretums, commercial nurseries, nature strips and windbreaks.*

*Note: 1. Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bush fire attack (recognizable as short cropped grass for example, to a nominal height of 100 mm). 2. A windbreak is considered a single row of planted trees located on a boundary and used as a screen or to reduce the effect of wind on the leeward side of the trees.”*

In effect, commercial nurseries are treated as if managed land or an APZ.

## 1.5 Environmental and heritage constraints

Submission requirements require the following environmental and heritage considerations that have the potential to be a constraint for implementing APZs within the site and may require further assessments before construction proceeds within a site:

- identification of any significant environmental features on the property;
- the details of any threatened species, population or ecological community identified under the *Biodiversity Conservation Act 2016 (BC Act)* that is known to the Applicant to exist on the property;
- the details and location of any Aboriginal object (within the meaning of the *National Parks and Wildlife Act 1974*) or Aboriginal place (within the meaning of that Act) that is known to the Applicant to be situated on the property;

The following sources databases were reviewed to determine whether any environmental and Aboriginal heritage constraints were present within the proposed site:

Table 1-1 – Databases

Potential constraint	Database
Aboriginal Heritage significant sites and places	Aboriginal Heritage Information Management System (AHIMS)

A 50m buffered area from the sites boundaries was used to identify any significant Environmental and Aboriginal heritage features.

A basic AHIMS search was conducted on 10 April 2024 of Lots 3 and 4 DP 26902 (Client Service ID: 882041 and 882176). No-known significant Aboriginal sites or places were identified in the search. There are no Aboriginal heritage constraints that require consideration when implementing bushfire protection measures for the site.

On-site ecological surveys conducted by *TBE* for the developments biodiversity development assessment report (BDAR) concluded with respect of matters required to be considered under the *EP&A Act* and relating to the species / provisions of the *BC Act*, six (6) threatened fauna species were recorded:

- Grey-headed Flying-fox (*Pteropus poliocephalus*),
- Southern Myotis (*Myotis macropus*),
- Little Bent-winged Bat (*Miniopterus australis*),
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
- Eastern Cave Bat (*Vespadelus troughtoni*)
- Powerful Owl (*Ninox strenua*),

Two threatened ecological communities (TEC) were recorded within the development footprint:

- Bangalay Sand Forest of the Sydney Basin (BSF)
- Swamp Oak Floodplain Forest (SOFF)

In respect of matters required to be considered under the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, one threatened fauna species the Grey-headed Flying-fox (*Pteropus poliocephalus*), and one TEC, the Coastal Swamp Oak Forest, were recorded within the development footprint.

In respect of matters relative to the *Fisheries Management Act 1994 (FM Act)*, no suitable habitat for threatened marine or aquatic species was observed within the development footprint.

## 2. BUSHFIRE THREAT ASSESSMENT

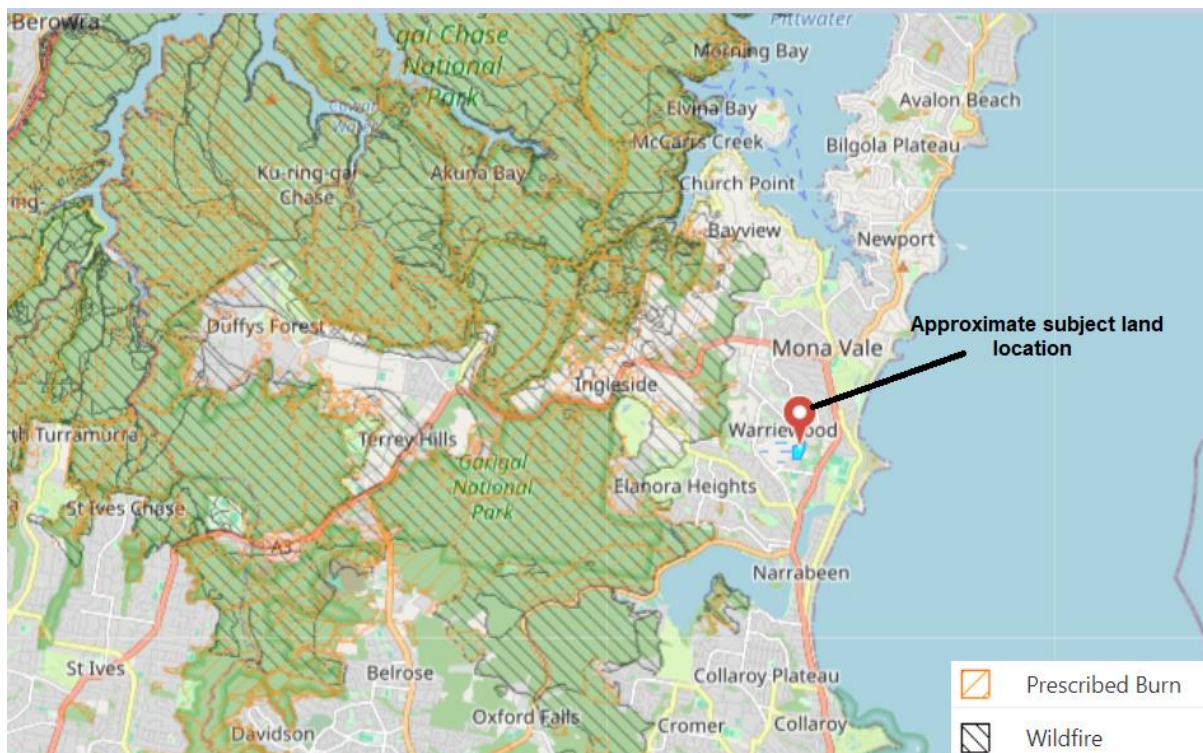
In order to complete a bushfire attack assessment and determine the required minimum APZ setbacks for a development, an assessment of the vegetation and the effective slope within the vegetation is required. The climatic region and fire history of the region are also considered.

### 2.1 Fire history

A fire history search of the subject land and its surrounding areas was conducted using the NSW National Parks and Wildlife Services (NPWS) 'NPWS Fire History- Wildfires and Prescribed Burns' database within the NSW SEED Portal.

There has been a total of 468 known fires recorded to have occurred within a 10km radius of the subject land's boundaries between the period of 1943-2024, this includes 332 prescribed burns and 136 wildfires. The majority of wildfire activity occurred to the northwest, west and southwest of the subject land in the extensive bushland of areas such as Garigal National Park and Ku-ring-gai Chase National Park. Wildfire activity also was recorded to the south in bushland at the south of Narrabeen Lagoon. The wildfire extent ranged from less than a hectare to 10 650 Ha in size.

No-known fires have been recorded to have directly impacted the subject land itself and no-known recorded fires have occurred within the Warriewood Wetlands on the adjoining land to the west of the subject land. (Refer to figure 2-1). This does not of itself mean that bushfire is not a threat to the site and care is warranted in relation to development of the site.



**Figure 2-1 – Fire history**  
(Source: NSW SEED Portal dated: 12/04/2024)



## 2.2 Predominant vegetation

*PBP* guidelines require the identification of the predominant vegetation formation in accordance with David Keith (2004) when using the simplified acceptable solutions in *PBP*. The vegetation is calculated for a distance of at least 140m from a proposed building envelope. The identified vegetation within 140m of the subject land's boundaries was identified from the *Geocortex* viewer within the *NSW SEED Portal* which includes layers relating to *NSW BioNet PCT sites* and *NSW State Vegetation Mapping*. The vegetation formations were then assessed in light of *Appendix 1* of *PBP* and at a site visit.

*Table 2-1 – Vegetation classification*

Vegetation community	Vegetation classification	Vegetation formation	<i>PBP</i> classification
South Coast Sands Bangalay Forest (PCT 3638)	South Coast Sands Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	Forest
South Coast Sands Littoral Scrub (PCT 3640)	South Coast Sands Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	Forest
Northern Paperbark-Swamp Mahogany Saw-sedge Forest (PCT 4006)	Coastal Swamp Forests	Forested Wetlands	Forest
Estuarine Swamp Oak Twig-rush Forest (PCT 4028)	Coastal Floodplain Wetlands	Forested Wetlands	
Unmanaged Grassland	Paddocks and semi-rural properties	Grassland	
Unspecified Grassy Woodland	Disturbed land	Grassy Woodland	

Photos of the site vegetation are shown below within figures 2-2 to 2-6.

The adjoining land to the north has a residential apartment building and a patch of grassland. Similarly, the adjoining land to the south-east, adjacent to Boondah Road, consists of a grassland and remnant vegetation within the semi-rural property which also has a residential dwelling. A narrow section of proposed 'forested wetland' exists on-site south of the neighbouring property, being 'managed land'.

There is a derived Grassy Woodland remnant (as an artefact) to the east of the subject land on the opposite side of Boondah Road in which the landscape is a partially cleared semi-rural property consisting of sparsely separated trees, predominantly eucalypts and banksias with a grassy ground-layer. Further east, the landscape transitions into Coastal Swamp Forest which under *Appendix 1* of *PBP* is classified as Forest vegetation. Beyond this is a 'water treatment works' which is considered 'managed land'.

The predominant vegetation on the adjoining land to the south and southwest is predominantly dense Forested Wetland dominated by Casuarinas (*Allocasuarina*). From halfway along the subject land's western boundary, the vegetation on the adjoining land to the west transitions into Coastal Swamp Forest (forest) which is situated on the fringes of the subject land's western boundary and contains large amounts of weeds.

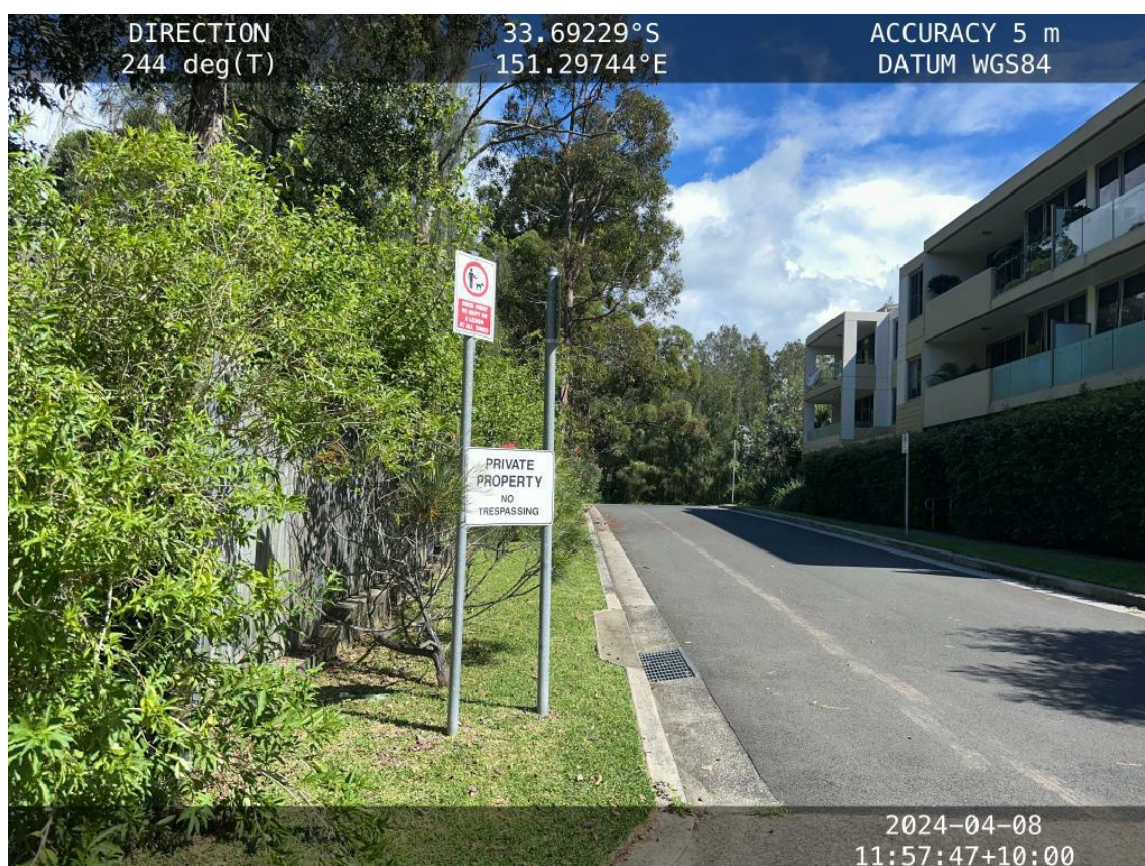


Based on the developments landscaping plan and planting schedule shown in Figure 1-8 and schedule 3 respectively, it is indicated that the southern corner of the subject land, as well as its western, northern and northeastern perimeters will be Forested Wetland vegetation in the form of Coastal Floodplain Wetland. The southern corner is proposed to be a 'EEL riparian C2 Zone' as per the developments site plan shown in Figure 1-7. The vegetation within this conservation area will be incorporated into the existing vegetation community *Estuarine Swamp Oak Twig-rush Forest (PCT 4028)* and is classified as a Coastal Floodplain Wetland.

Furthermore, the developments landscape plan indicates that the western perimeter of the subject land will be 'Wetland buffer zone planting', the northern perimeter 'matrix planting' and the eastern perimeter a mixture of native screen planting and a 'biodiversity display'. Although the planting schedules for these planting zones vary, they are all more consistent with a Coastal Floodplain Wetland rather than a Coastal Swamp Forest classification. This is based on indicative species for such classifications as per their Keith formations (Keith 2004).

The trees proposed to be planted within the developments landscaping planting schedule lack indicative species for Coastal Swamp Forests and consist of multiple indicative species for Coastal Floodplain Wetlands such as Cabbage Tree Palms, Sydney Red Gums and Swamp Oaks (which are only sporadically found within Coastal Swamp Forests). Similar for understorey plants and grasses such as Cheese trees, Swamp Paperbarks, Slender Knotweed, White Root, Bordered Panic, and Tall saw-sedges. Therefore, based on the Keith formations, these planting zones around the western, northern and eastern perimeters of the site are considered to be Coastal Floodplain Wetland (Keith 2004) (heath) and Forested Wetland (forest) as per *Appendix 1 of PBP*. (Refer to schedule 3).

There is also a bio-retention basin proposed to be located in the southwestern corner of the development and is proposed to consist of grasses such as Tall Sedges, Native Arthritis Plants, Knobby Club-Rushes, Common Rushes and Yellow Marsh Flowers. Therefore, the bio-retention basin is considered to be grassland. (Refer to schedule 3)



**Figure 2-2 – Residential apartments on the adjoining land to the north**





**Figure 2-3 – Grassy Woodland vegetation within disturbed land to the east on the opposite side of Boondah Road**



**Figure 2-4 – Grassland and Remnant vegetation on the adjoining land to the south**  
(Source: Google Maps Streetview dated: 12/04/2024)





Figure 2-5 – Forested Wetland vegetation (Warriewood Wetlands) in the western section of the subject-land and on the adjoining land to the west



Figure 2-6 – Overgrown weedy area amongst Forested Wetland vegetation in the northwestern of the subject land



## 2.3 Effective slope

The effective slope has been assessed for up to 100m from the development site. Effective slope refers to that slope which provides the most effect upon likely bushfire behaviour. A mean or average slope may not in all cases provide sufficient information such that an appropriate assessment can be determined. Wherever possible, slopes have been assessed on the greatest gradient so as to determine the most adverse BAL rating.

In general, the subject land exhibits a slight downslope topography in an east to west direction. The 'Forest' vegetation within the proposed C2 conservation area in the southern section of the subject land, as well as Forested Wetland vegetation in its eastern section will be a mixture of cross-slope and upslope with respect to the development. The Forested Wetland vegetation within its western and northern sections will be slightly downslope with respect to the development.

External to the subject land, the Grassy Woodland and Forest vegetation to the east on the opposite side of Boondah Road and the Grassland and Remnant vegetation on the adjoining land to the south will be a mixture of cross slope and upslope with respect to the development. The grassland on the adjoining land to the north and Forested Wetland and Forest within the Warriewood Wetlands on the adjoining land to the west is slightly downslope with respect to the development. (Refer to schedule 1).

## 2.4 Regional fire weather conditions

The study area assessment methodology relies on the application of the relevant fire weather conditions, referred to as Fire Danger Index (FDI) or Grassland Fire Danger Index (GFDI) for grassland vegetation. The acceptable solutions for the Northern Beaches which are associated with the Greater Sydney Fire Weather District and is given as an FDI and GFDI of 100 and 130 respectively.

For these given values, Table A1.12.2 of *PBP* is used for the Greater Sydney Region District in determining the relevant APZs.

## 2.5 Bushfire attack assessment

The development will involve the construction of one building, the garden centre within the southern section of the development which will be used for the purpose of a commercial nursery. As a result, the garden centre is considered to be a Class 5-8 building and a commercial development. The bushfire attack assessment for the garden centre will be based on the APZ setbacks required for a residential development as per *section 8.3.10 of PBP* and section 1.4.2(d) of this report.

Table 2-2 provides a summary of the bushfire attack assessment based on a residential development and the methodologies used to determine APZs within *PBP*.

The APZs are required to be wholly within the subject lands boundaries and should not rely on being on adjoining land. APZs can extend beyond a subject land's boundaries in cases where structures or features of a landscape are considered permanent and act as barriers against fire spread. Examples include road carriageways, urban landscapes or land with vegetation that is considered managed. There are no specified minimum APZ setback required for non-residential buildings although this is generally assessed at a rating of BAL-29, which ensures buildings are not exposed to a radiant heat flux exceeding 29 kW/m<sup>2</sup>.

It should be noted that this assessment makes no assumption that development in the form of schools, hospitals or medical centres, seniors living or other retirement accommodation, or group homes will be developed. These developments are considered special fire protection purposes and require a significantly greater setback to achieve a maximum radiant heat flux of no more than 10kW/m<sup>2</sup>.

The APZ requirements are identified within Table 2-2 below.

*Table 2-2 – Bushfire attack assessment*

Aspect	Vegetation formation	Effective slope	APZ required (BAL-29)	APZ provided	Comments
North	Forest (retained Bangalay Protected Area), Forested Wetland, Grassland & Managed Land	>0-5° downslope	29m	84m (BAL-12.5)	The minimum required of 29m can be provided within the subject land's boundaries. The commercial gardens section of the development will provide an additional buffer between the Forested Wetland vegetation and the garden centre.
Northeast and east	Landscaping (boundary) (>24m) and Forest (>62m)	Upslope and cross-slope (part downslope with a slight rise at about 40m)	29m	>53m (BAL-12.5)	The minimum APZ required of 29m can be provided within the boundaries of the subject land. The commercial gardens and carpark sections of the development will provide an additional buffer between the vegetation and the garden centre. With additional buffer from Boondah Rd, the setback from potential 'forest' is 37-54m.
Southeast	Grassland and artefact grassy woodland.	Cross-slope (assume slight downslope)	12-16m	36m (BAL-12.5)	This section of vegetation is considered to be grassland/artefact grassy woodland. The required APZ of 12-16m can be provided within the boundaries of the subject land. The carpark and bitumen road provides a buffer between the vegetation and the garden centre.

Aspect	Vegetation formation	Effective slope	APZ required (BAL-29)	APZ provided	Comments
Southwest and west	Forested Wetland (C2 zone/ wetland buffer zone) and forest	>0-5° downslope	12-29m	>24-49m (BAL-12.5)	The required APZ of 12-29 m can be provided within the subject land's boundaries. The commercial gardens section of the development and bitumen road provides a buffer between the vegetation and the garden centre. (Refer to figure 1-8 and schedule 1).

In summary, the development can provide the minimum APZ setbacks required by *PBP* to ensure that the proposed garden centre is not exposed to a radiant heat-flux exceeding 29kW/m<sup>2</sup> as per the bushfire attack assessment in Table 2-2 above and Schedule 1.

However, the nature of the landscaping for the commercial gardens and tea/ coffee garden sections of the development with respect to the garden centre need to be considered. In addition, the garden centres proximity to Class 10a structures such as storage sheds and the kid's playground also requires consideration. This is discussed further below in Section 3.1.

It should be noted that 'commercial nurseries' are considered 'low threat' vegetation and excluded from assessment. When considering internal roads, carparking and garden beds/landscaping, the site's garden centre building is well separated from the bushfire threat.

The above bushfire assessment provides a 'conservative' approach in those areas of disturbed vegetation to the south and east under current and future management arrangements, are likely to be retained in a grassy condition. Boundary fencing has been assumed to present a minimal risk, however are assessed as a conservative approach.

The bio-retention basin will contain some grasses, rushes and reeds but is not considered a significant internal threat and will be more than 10m from the lower bank of the basin (being flat ground).



## 3. SPECIFIC PROTECTION ISSUES

Bushfire Protection Measures (BPMs) include provisions relating to APZs, access, water supply, electricity and gas services, construction standards, landscaping and emergency evacuation.

### 3.1 Asset protection zones (APZs)

The proposed development can achieve the minimum APZ setbacks required that ensure the garden centre is exposed to a radiant heat-flux exceeding  $29\text{kW/m}^2$ . (Refer to Section 2.5 and Schedule 1). The APZs will also be wholly within the subject lands boundaries and not reliant on being situated on adjoining land. The entire development area that is either identified as an Asset Protection Zone or buildable area as indicated within Schedule 1 must be managed as an inner protection area (IPA) as per *Appendix 4 of PBP* and as shown within Schedule 2 of this report. This must occur for the lifetime of the development or until the potential bushfire hazard is removed.

This should include the commercial gardens area of the development. The landscaping for the commercial gardens is only indicative within the developments site plan and landscape plan and do not demonstrate the specific nature of the planting layout within each garden. (Refer to Figure 1-7 and 1-8). The Biodiversity Display Area (and Bangalay Woodland Protection Zone) to the north represents an extension to the western wetland area.

However, if it is assumed the commercial garden area of the development cannot meet the landscaping requirements for an IPA, then the entire commercial garden should be treated as low threat vegetation as per *section A.1.10 of PBP*. The entire commercial garden area has an approximate area of 0.36Ha and is separated from the Forested Wetland vegetation around the western, northern and eastern perimeter of the subject land by the pedestrian access. (Refer to Figure 1-8 and Schedule 1).

Furthermore, the setback distance from the edge of the commercial garden area is approximately 18m from the northern perimeter of the garden centre building footprint. Based on a conservative effective slope being within the 0-5° downslope category for the northern and western aspects, the minimum APZ setback required to satisfy a BAL-29 rating as per *Table A1.12.2 of PBP* is 14m. Therefore, the garden centre is still able to achieve the minimum APZ setbacks that ensure the garden centre is exposed to a radiant heat-flux exceeding  $29\text{kWm}^2$  if the landscaping for the commercial gardens area cannot meet IPA standards. (Refer to Figure 3-3).

The landscaping around the garden centre itself must also comply with the requirements for an IPA as per *Appendix 4 of PBP* and as shown in schedule 2 of this report, this includes the kid's playground and tea/ coffee garden. Based on the concept art for the garden centre this will be achieved for the immediate areas around the building. (Refer to Figure 3-1).

The kid's playground should also be situated a minimum of 6m from the garden centre building. Based on the current plans, this will be achieved as the distance between the garden centre and the edge of the indicative structure's kids' playground area of the site is approximately 6m. (Refer to Figure 1-8).

Table 3.1 outlines the proposal's compliance with the performance criteria for APZs.



**Figure 3-1 – Garden centre concept art (southern aspect)**  
(Source: Buchan, dwg no. AMP-9901, project no. 230736, rev. 4, dated: 06/03/2024)

**Table 3-1 – Requirements for asset protection zones (PBP guidelines)**

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
APZs are provided commensurate with the construction of the building; and A defensible space is provided.	APZs are provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. (Refer to section 2.5 and schedule 1). Internal 'building area' effectively provides increased APZs. BAL-12.5 recommended.
APZs are managed and maintained to prevent the spread of a fire to the building.	APZs are managed in accordance with the requirements of Appendix 4 of <i>PBP</i> .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. (Refer to the above discussion). Site managed as a nursery.
The APZs are provided in perpetuity.	APZs are wholly within the boundaries of the development site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. APZs will be wholly within the subject land's boundaries.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZ are located on lands with a slope less than 18 degrees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. All slopes are relatively flat and less than 18 degrees. Site fully managed with garden beds.

Note 1: Section 7.6 of *PBP* states that all fences in bush fire prone areas should be made of either hardwood or non-combustible material. However, in circumstances where the fence is within 6m of a building or in areas of BAL 29 or greater, they should be made of non-combustible material only. All boundary fencing in subdivision should be non-combustible (or post & wire) due to lot size constraints (s.88B restriction required).

## 3.2 Construction standards

The construction standards of commercial buildings within the subject land that will be situated on BFPL and within 100m of bushland or 50m of grassland are to applied in accordance with *AS3959 Construction of buildings in bushfire prone areas (2018)* and *section 7.5 of PBP*. The garden centre will be able to comply. The proposal's compliance with the acceptable solutions outlined in *PBP* is detailed within Table 3-2 below.

**Table 3-2 – Requirements for construction (PBP guidelines)**

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	BAL is determined in accordance with Tables A1.12.2 & A1.12.5; and	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The garden centre is recommended to be constructed to BAL-12.5
	Construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. The garden centre is not situated within BAL-40 or FZ areas and is recommended to be constructed to BAL-12.5.



Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Proposed fences and gates are designed to minimise the spread of bush fire.	Fencing and gates are constructed in accordance with section 7.6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fencing should be post & wire (western boundary) or non-combustible (northern, eastern and southern boundaries).
Proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. The storage area on the western side of the garden centre building is considered a part of the building itself in the bushfire attack assessment within section 2.5 and schedule 1. (Refer to figure 1-7).

### 3.3 Access for firefighting operations

There will be one primary access/ egress point to the development from Boondah Road in the subject lands southeastern corner. There will be perimeter roads accessing around the development area which will be 6 m in width. These roads will comprise both a pedestrian walkway (& internal fire trail), as well as access to carparking areas. (Refer to Figure 1-8 above). As a result, the proposed internal road system will provide firefighters frontage access to potential bushfire threats and will enable firefighting vehicles to keep moving in a forward direction. The use of a 6m perimeter road is a deviation from the requirements of *PBP*.

**Performance solution:** There will be a connected perimeter road that runs along the southern, western and northern boundaries of the development. The road will transition from bitumen to a gravel pedestrian/ fire trail in the southern corner of the development. This pedestrian way/fire trail will travel along the development's eastern boundary, then adjacent to the biodiversity display area and will link up along the eastern side to the entrance road in the development's southeastern corner via the carpark. (Refer to Figure 3-3 and Schedule 1). The road provides a one-way travel direction to the potential hazard, which with the width of the firefighting vehicle will not experience conflicting traffic, aiding operational firefighting. The normal 8m width is required where there is two-way traffic movement which may impede the operational space for firefighting. In this case, there is only a one-way flow for vehicles along the perimeter.

This road will be through a road to enable firefighting vehicles to keep moving in a forward direction and be designed to provide frontage access to potential threats, including the proposed bio-retention basin slightly south of the garden centre. No non-perimeter dead-end roads are proposed.

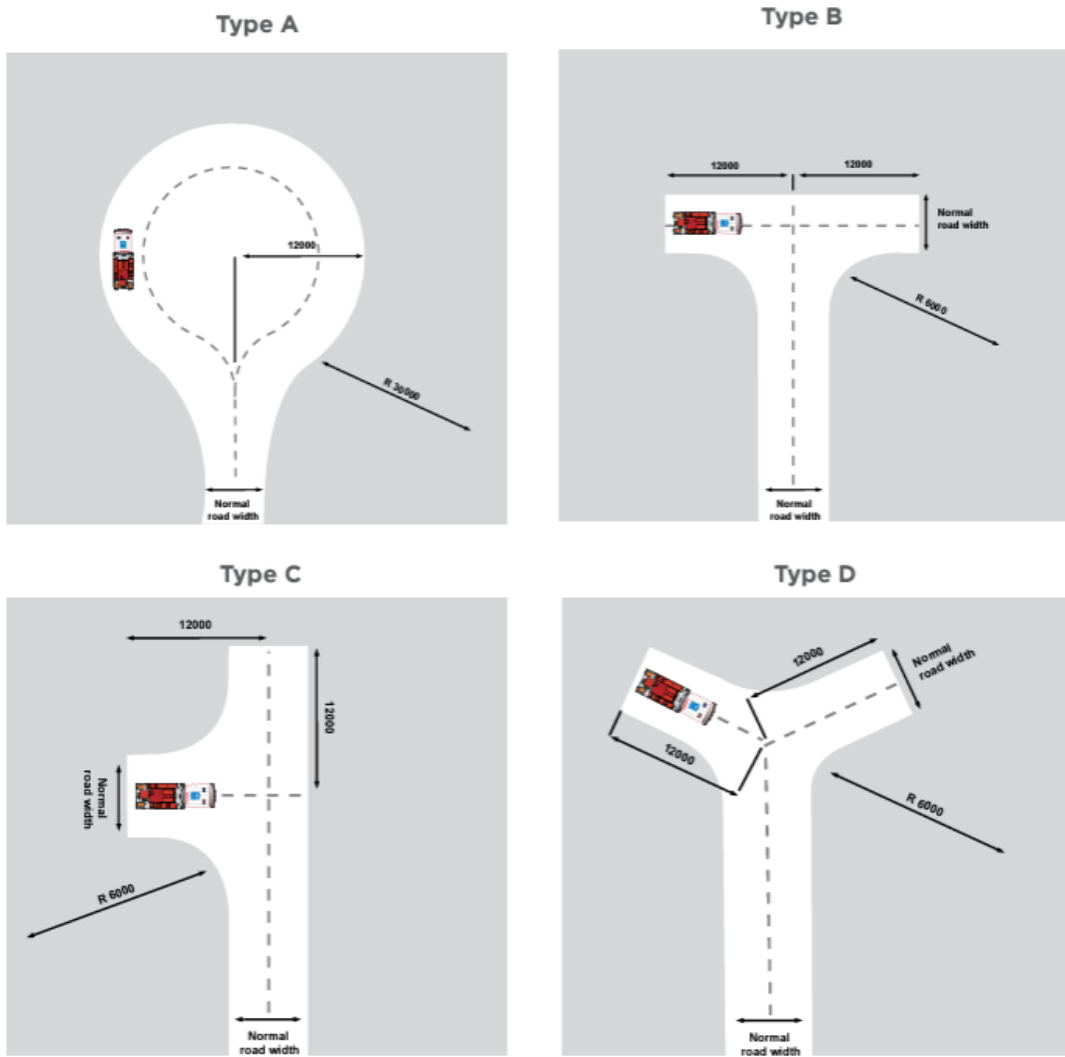
The Warriewood Nursery has a 6.5 m wide non-perimeter road around the northern, western and eastern boundaries of the garden centre building. Access is also available from the south. This area currently does not have a turning head although the loading dock provides suitable turning head (see Type C turning head below in Figure 3-3).

The proposal's compliance with the specifications and requirements outlined in *PBP* is detailed within Table 3-3 below, noting that an 8m perimeter road is not provided and a 6m one-way road (trail) is offered as a reasonable performance arrangement having regard to the level of threat.

Table 3-3 – Requirements for access (PBP Guidelines)

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Property access roads are two-wheel drive, all weather roads.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Internal roads will either be bitumen or pedestrian/fire access capable to provide for all-weather access. (Refer to figure 1-8).
	8m wide perimeter road	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Deviates.</b> Perimeter roads are 6m and will be one-way through-roads outside of the building curtilage.
	Outside edge to be roll top curve on hazard side.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Western boundary has access to main hazard and will need to be a roll top kerb.
The capacity of access roads is adequate for firefighting vehicles.	The capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Complies. Internal roads will be a mixture of bitumen and gravel. Will need to be designed to meet loads (FRNSW Pumper).
There is appropriate access to water supply.	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	N/A	N/A	Water to the development will be reticulated. Hydrants yet to be identified.
Firefighting vehicles can access the dwelling and exit the property safely.	At least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There is one access/ egress point to the development, however access is not greater than 200m.

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.	N/A	N/A	Not applicable.



**Figure 3-2 – Multipoint turning options**  
 (Source: Figure A3.13 of PBP)



## 3.4 Utilities

Utilities are intended to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

### 3.4.1 Water supplies

Table 3-4 outlines the proposal's compliance with the acceptable solutions for reticulated water supply.

*Table 3-4 – Requirements for water supplies (PBP guidelines)*

Performance criteria	Performance criteria	Acceptable solution	Performance solution	Comment
An adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reticulated water will be able to be provided to the development.
	A static water supply is provided where no reticulated water is available.	N/A	N/A	Not applicable as reticulated water will be provided to the development.
Water supplies are located at regular intervals. The water supply is accessible and reliable for firefighting operations.	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There are currently no water or hydrant layout plans for the development. Hydrant system must comply with NCC.
	Hydrants are not located within any road carriageway.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Must comply. Development is not a subdivision
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hydrants to comply with NCC at Construction Cert. stage.
The integrity of the water supply is maintained.	All above-ground water service pipes external to the building are metal, including and up to any taps.	N/A	N/A	Not applicable as the development will have reticulated water. Must comply if static water is going to be made available.
A static water supply is provided for firefighting purposes in areas where reticulated	Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d.	N/A	N/A	Not applicable as reticulated water will be provided consistent with NCC requirements.

Performance criteria	Performance criteria	Acceptable solution	Performance solution	Comment
water is not available.	A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet.	N/A	N/A	Not applicable as reticulated water will need to comply with NCC requirements.
	Ball valve and pipes are adequate for water flow and are metal.	N/A	N/A	
	Supply pipes from tank to ball valve have the same bore size to ensure flow volume.	N/A	N/A	
	Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank.	N/A	N/A	
	A hardened ground surface for truck access is supplied within 4m.	N/A	N/A	
	Above-ground tanks are manufactured from concrete or metal.	N/A	N/A	
	Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).	N/A	N/A	
	Unobstructed access can be provided at all times.	N/A	N/A	
	Underground tanks are clearly marked.	N/A	N/A	
	Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.	N/A	N/A	
	All exposed water pipes external to the building are metal, including any fittings.	N/A	N/A	

Performance criteria	Performance criteria	Acceptable solution	Performance solution	Comment
	Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter. And;	N/A	N/A	
	Fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.	N/A	N/A	

### 3.4.2 Gas services

Table 3-5 outlines the required acceptable solutions for gas supply. Gas is not proposed for the proposed development.

*Table 3-5 – Requirements for gas supplies (PBP guidelines)*

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Location of gas services will not lead to the ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas bottles are to be installed and maintained in accordance with AS/NZS 1596 (2014), the requirements of relevant authorities and metal piping is to be used.	N/A	N/A	There are currently no plans to supply gas to the development. In general, gas supply is not recommended. However, if necessary to the development, reticulated gas is preferred to bottled gas.
	All fixed gas cylinders are to be kept clear of flammable materials to a distance of 10m and shielded on the hazard side.	N/A	N/A	
	Connections to and from gas cylinders are metal.	N/A	N/A	
	If gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion;	N/A	N/A	

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
	Polymer sheathed flexible gas supply lines are not used.	N/A	N/A	
	Above ground gas service pipes are metal, including and up to any outlets.	N/A	N/A	

### 3.4.3 Electricity

Table 3-6 outlines the required acceptable solutions for the development's electricity supply.

*Table 3-6 – Requirements for electricity (PBP guidelines)*

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Location of electricity services limit the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	It is understood that there are currently no electrical plans for the development. However, electricity can be provided underground to the development from the existing overhead powerlines.
	Where overhead electrical transmission lines are proposed: lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There are currently no electrical plans for the development. However, future electrical plans must comply.

Electrical power can be provided to the street. While there are no specifications provided for the development, it would be reasonable to provide a condition of consent requiring power to be underground within the site.

## 3.5 Emergency and evacuation planning

Table 3-7 outlines the required performance criteria for the proposal's emergency procedures.

*Table 3-7 – Requirements for emergency and evacuation planning (PBP Guidelines)*

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
A bushfire emergency and evacuation management plan is prepared	<p>A bushfire emergency management and evacuation plan is prepared consistent with the:</p> <ul style="list-style-type: none"> <li>The NSW RFS document: <i>A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan</i></li> <li>NSW RFS <i>Schools Program Guide</i> (where applicable)</li> <li>Australian Standard AS 3745:2010 <i>Planning for emergencies in facilities</i>; and</li> </ul> <p>Australian Standard AS 4083:2010 <i>Planning for emergencies – Health care facilities</i> (where applicable),</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	A Bush Fire Emergency Management and Evacuation Plan can (and should) be developed. Plan is to be updated and staff trained annually prior to commencement of the bush fire danger period.
Note: A copy of the Bushfire Emergency Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.				
Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan.	<p>An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual.</p> <p>Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	A Bush Fire Emergency Management and Evacuation Plan can (and should) be developed. Plan is to be updated and staff trained annually prior to commencement of the bush fire danger period.



## 4. CONCLUSION & RECOMMENDATIONS

### 4.1 Conclusion

This bushfire protection assessment has been undertaken for the proposed Warriewood Nursery development located at 10-12 Boondah Road, Warriewood (Lot 3 & 4 DP26902). The project will involve constructing a garden centre building, parking spaces, open spaces for commercial gardens, playground, planting zones, a bio-retention basin and a conservation area within the subject land.

This assessment has found that although bushfire can potentially affect the development from forested wetlands and forest vegetation to the north, east, south and west, as well as grassland and artefact vegetation to the south-east and south, the threat is considered relatively low. This has the potential to result in future buildings being exposed to some potential radiant heat and ember attack. In recognition of the requirements of *PBP* and the potential bushfire risk posed to the development by nearby bushland, *TBE* propose the following combination of bushfire measures:

- APZ setbacks are required the minimum setbacks for BAL-29 and in accordance with the minimum setbacks outlined with *PBP* as described in Section 2.5 and as depicted in Schedule 1 of this report.
- Provision of access in accordance with the Landscaping Plan outlined within section 3.3 and Figure 1-8 of this report.
- Water and electricity supply in compliance with the acceptable solutions outlined in *PBP* and Section 3.4 of this report. Gas is not to be connected.
- Future construction in compliance with *PBP* and the appropriate construction sections of AS3959-2018 to comply with BAL 29.
- Preparation of a Bushfire Emergency Evacuation Plan (BEEP) as per section 3.5 of this report. This BEEP is to be updated and staff trained in its operation on an annual basis prior to the commencement of the statutory bush fire danger period.

The following recommendations are provided to ensure that the development is in accordance with, or greater than, the requirements of *PBP* (recognising that the development is for a commercial nursery).

Note: the normal RFS draft conditions are not applicable for this form of development being a commercial nursery. The site should be managed as an inner protection area but need to acknowledge the retained vegetation (Bangalay woodland) to the north, as well as boundary plantings for landscaping.

### 4.2 Recommendations

**Recommendation 1** – The development including APZs is as generally indicated on the attached Schedule 1- Plan of Bushfire Protection Measures and in section 2.5 of this report.

**Recommendation 2** – All asset protection zones and the buildable area identified within schedule is to be managed as an IPA for the lifetime of the development or until the potential bushfire threat is removed. This should be in accordance with *Appendix 4* of *PBP* and principles as shown within schedule 2 of this report. Note that being a nursery the standard RFS advice for landscaping would not be appropriate.

**Recommendation 3** – Access is to comply with the Landscape Plan outlined in Figure 1-8 and section 3.3 of this report. The following provisions in relation to access therefore apply:

- minimum 6m carriageway width kerb to kerb;
- parking is provided outside of the carriageway width;
- hydrants are located clear of parking areas;
- roads are through roads, and these are linked to the internal road system at an interval of no greater than 200m;
- curves of roads have a minimum inner radius of 6m;
- car parking is provided outside of the carriageway width;
- where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard (western) side of the road;
- the capacity of perimeter and non-perimeter road surfaces is sufficient to carry fully loaded firefighting vehicles (up to 17 tonnes);
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
- hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021 - Fire hydrant installations System design, installation and commissioning, and the requirements of the National Construction code for this class of building;
- the road crossfall does not exceed 3 degrees; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

**Recommendation 4** – Water and electricity supply is to comply with Section 7.4 of *PBP* and section 3.4 of this report. Gas supply is not recommended. Any water tanks provided are to be non-combustible or located greater than 6m from the main building.

In this regard the following conditions apply:

The provision of water and electricity installed as part of this subdivision must comply with the following in accordance with Table 5.3c of *Planning for Bush Fire Protection 2019*:

- reticulated water is to be provided to the development where available;
- fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS2419.1:2021;
- hydrants are not located within any road carriageway;
- reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021;
- all above-ground water service pipes are metal, including and up to any taps; and
- electrical transmission lines within the site are underground;

**Recommendation 5** – Construction for the proposed future nursery centre/shop situated on-site is to comply with BAL 12.5 in accordance with *AS3959 Construction of buildings in bushfire prone areas (2018)*, and Section 7.5 of *PBP*.

**Recommendation 6** – Preparation of a Bushfire Emergency Evacuation Plan (BEEP) by a bush fire consultant. This plan is to be updated and staff trained in its operation on an annual basis prior to the start of the statutory bush fire danger period.

## 5. INFORMATION SOURCES

### 5.1 Information collation

- 1) Aboriginal Heritage Information Management System (AHIMS).
- 2) Buchan 2024, *Warriewood Nursery 10 Boondah Road, Warriewood NSW 2102*, no. 230736, rev. 4, dated: 06/03/2024.
- 3) John Chetham & Associates 2024, *Proposed Nursery 10 Boondah Road, Warriewood*, no. 10BR/LP/DA, rev. F, dated: 19/04/2024.
- 4) Mecone Mosaic
- 5) NSW Planning Portal.
- 6) NSW SEED Portal.
- 7) Pittwater Council 2017, *Warriewood Valley Strategic Review Addendum Report*, amended: 19 December 2017.
- 8) *Pittwater Local Environmental Plan 2014 (Pittwater LEP)*

### 5.2 Bibliography

Australian Building Codes Board (2010) *Building Code of Australia*, Class 1 and Class 10 Buildings Housing Provisions Volume 2.

Councils of Standards Australia AS3959 (2009) – *Australian Standard Construction of buildings in bush fire-prone areas*.

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change.

Rural Fire Service (2019) - *Planning for bush fire protection – a guide for councils, planners, fire authorities and developers*. NSW Rural Fire Service.

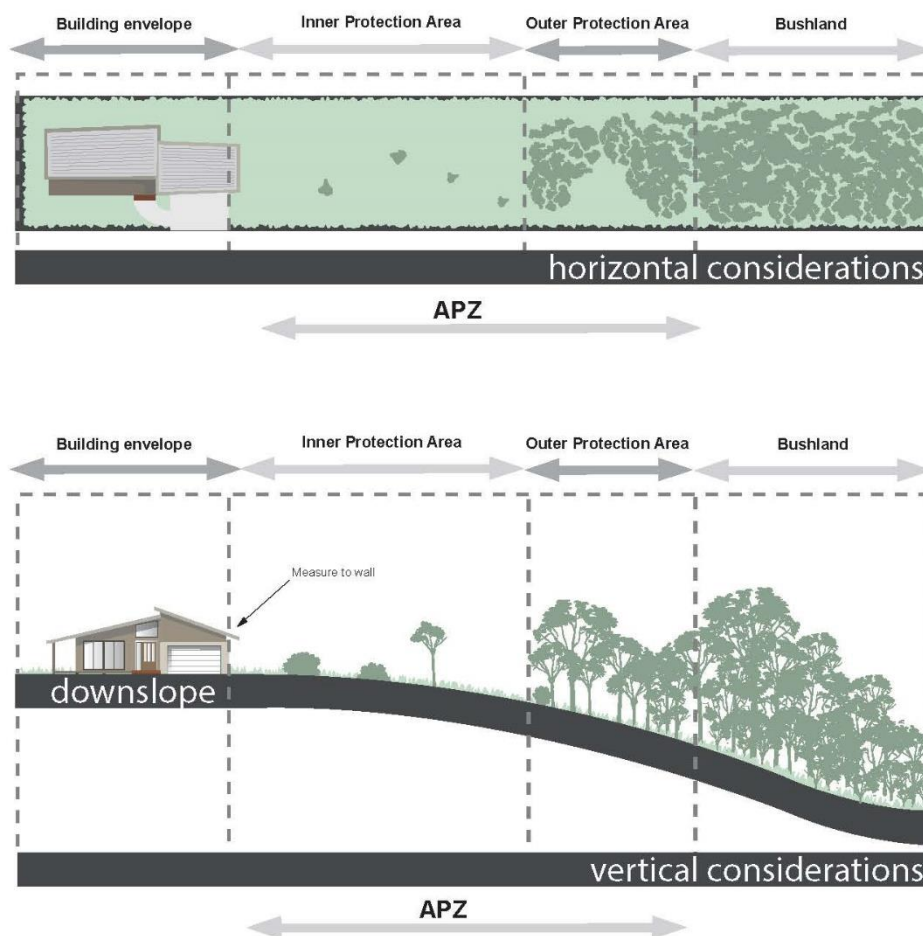
Tan, B., Midgley, S., Douglas, G. and Short (2004) - *A methodology for assessing bushfire attack*. RFS Development Control Service.

# SCHEDULE 1. PLAN OF BUSHFIRE PROTECTION MEASURES

## SCHEDULE 2. MANAGEMENT OF ASSET PROTECTION ZONES

The RFS provides basic advice in respect of managing APZs through documents such as, *Standards for Asset Protection Zones* (RFS, 2005), with landscaping to comply with Appendix 4 of *PBP*. At this stage only street landscaping is envisaged as part of the development.

The APZ generally consists of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The OPA is closest to the bush and the IPA is closest to the dwellings. The property is to be managed to IPA standards only. A typical APZ is graphically represented below. The riparian area on-site is to be restored to a bushland condition.



### APZs and progressive reduction in fuel loads

(Source: *PBP*, 2019)

**Note:** Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought regarding vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the RFS performance criteria.

The following table adapted from *PBP* provides maintenance advice for vegetation within the IPA and OPA. The APZ is to be maintained in perpetuity and maintenance should be undertaken regularly, particularly in advance of the bushfire season.



	Inner Protection Area	Outer Protection Area
Trees	<ul style="list-style-type: none"> <li>➤ Tree canopy cover should be <b>less than 15%</b> at maturity;</li> <li>➤ Trees at maturity should not touch or overhang the building;</li> <li>➤ Lower limbs should be removed up to a height of <b>2m above the ground</b>;</li> <li>➤ Tree canopies should be separated by <b>2 to 5m</b>; and</li> <li>➤ Preference should be given to retaining smooth barked and evergreen trees.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Tree canopy cover should be <b>less than 30%</b>; and</li> <li>➤ Canopies should be separated by <b>2 to 5m</b>.</li> </ul>
Shrubs	<ul style="list-style-type: none"> <li>➤ Large discontinuities or gaps in the vegetation should be provided to slow down or break the progress of fire towards buildings;</li> <li>➤ Shrubs should not be located under trees;</li> <li>➤ Shrubs should form <b>less than 10%</b> ground cover; and</li> <li>➤ Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Shrubs should not form a continuous canopy; and</li> <li>➤ Shrubs should <b>form less than 20%</b> of ground cover.</li> </ul>
Grass and Leaf Litter	<ul style="list-style-type: none"> <li>➤ Grass should be kept mown to a height of <b>less than 100mm</b>; and</li> <li>➤ Leaves and other debris should be removed</li> </ul>	<ul style="list-style-type: none"> <li>➤ Grass should be kept mown to a height of <b>less than 100mm</b>; and</li> <li>➤ Leaf and other debris should be removed.</li> </ul>
All Management Zones		
Weeds	<ul style="list-style-type: none"> <li>➤ All weeds should be removed in accordance with best practice guidelines, and measures taken to prevent their further spread</li> </ul>	
Landscaping	<ul style="list-style-type: none"> <li>➤ Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;</li> <li>➤ Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come into contact with the building;</li> <li>➤ When considering landscape species consideration needs to be given to estimated size of the plant at maturity;</li> <li>➤ Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies;</li> <li>➤ Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;</li> <li>➤ Avoid planting of deciduous species that may increase fuel at surface / ground level (i.e. leaf litter);</li> <li>➤ Avoid climbing species to walls and pergolas;</li> <li>➤ Locate combustible materials such as woodchips / mulch, flammable fuel stores away from the building;</li> <li>➤ Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture way from the building; and</li> <li>➤ Use of low flammability vegetation species.</li> </ul>	

