



Bushfire Assessment

Planning Proposal

105 Cooby Road, Tullimbar

Tullimbar Heights Pty Ltd

6 September 2019

(Ref: 18157)

report by
david peterson

0455 024 480

david@petersonbushfire.com.au

po box 391 terrigal nsw 2260

petersonbushfire.com.au

FPA AUSTRALIA (NO.BPAD18882)
BPAD LEVEL 3 ACCREDITED PRACTITIONER

ABN 28 607 444 833

Contents

Executive summary	3
1 Introduction	5
1.1 Background	5
1.2 Location of subject land.....	5
1.3 The proposal	5
2 Assessment requirements.....	8
3 Bushfire hazard and risk	11
3.1 Bushfire hazard	11
3.2 Bushfire threat.....	11
3.3 Bushfire risk	12
4 Addressing compliance.....	14
4.1 Direction 4.4.....	14
4.2 Planning for Bushfire Protection 2006 (PBP).....	16
5 Conclusion and recommendations.....	21
References	22

Executive summary

Objective

This Bushfire Assessment Report was commissioned by Tullimbar Heights Pty Ltd to inform a Planning Proposal application seeking approval to rezone bushfire prone land at 105 Cooby Road, Tullimbar to allow future residential subdivision. The objective was to assess the bushfire hazard and risk and recommend bushfire protection measures commensurate with the risk to achieve compliance with the relevant specifications and requirements for protection against bushfires.

Compliance with legislation and policy

A Planning Proposal on bushfire prone land must have regard to the *Environmental Planning and Assessment Act 1979* Section 9.2 Ministerial Direction No. 4.4 – ‘Planning for Bush Fire Protection’, referring to the document *Planning for Bushfire Protection 2006*.

Bushfire hazard, threat and risk

The hazard consists of a rainforest vegetation complex along the steep slopes within and adjacent the subject land. Taking on varying forms and highly disturbed from past grazing activity and weed invasion, the predominant vegetation that will remain has been classified as ‘rainforest’ and ‘woodland’ for the purposes of APZ determination. Forest is also present on the adjoining lands to the west and south which will require consideration at subdivision stage.

Beyond the subject land, the bushfire threat is assessed to be low to medium due to the hazard being confined to the gully walls and riparian zones, as well as the predominance of managed land uses beyond. The hazards adjacent the site are not well-connected to the rainforest and forests of Stockyard Mountain to the south.

The Illawarra Bushfire Risk Management Plan (Illawarra Bushfire Risk Management Committee 2017) reports the absence of landscape-wide fire within the surrounding area of the coastal plain since recorded history. A risk rating of future residential development at the subject land would be low as there will be compliant bushfire protection measures.

Measures to achieve compliance

Bushfire protection measures for future residential development recommended within this report to achieve the requirements are listed below:

- Provision of compliant APZs between future building envelopes and bushfire hazards, which will consist of corridors of rainforest within the subject land, and rainforest and forest adjoining the subject land to the west and south.
- Adequate access for emergency response and evacuation.
- Compliant road widths and design.

- Perimeter subdivision roads between low density lots and identified hazards.
- Adequate water supply to allow fire-fighting operations by fire authorities.

Conclusion

The report concludes that the Planning Proposal together with the recommended bushfire protection measures satisfies the specifications and requirements of Ministerial Direction No. 4.4 and *Planning for Bushfire Protection 2006*.

1 Introduction

1.1 Background

Tullimbar Heights Pty Ltd commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to accompany a Planning Proposal to rezone land in Tullimbar to allow future subdivision for residential development. This report addresses the requirements for assessment of rezoning proposals involving bushfire prone land, namely the *Environmental Planning and Assessment Act 1979* Section 9.2 Ministerial Direction 4.4 – ‘Planning for Bush Fire Protection’.

1.2 Location of subject land


The subject land (Lot 240 DP 828854) is an ex-grazing property located towards the end of Cooby Road on the southern edge of the locality of Tullimbar. The location of the subject land is shown on Figure 1. At approximately 29 hectares in size, almost half is in a cleared state, with the remainder supporting regrowth rainforest and forest/woodland communities, predominantly on the steep slopes that are a characteristic feature of the property and adjoining lands.

1.3 The proposal

The proposal seeks to rezone the subject land to allow residential subdivision throughout low density, environmental living and rural interface zones. A concept subdivision layout is included as Figure 2. Future subdivision of the property will effectively provide the next stages of the Tullimbar Village which is gradually extending southwards up the Hazelton Creek valley.



Legend

 Subject Land



Date: 11/12/2018

0 250 500 1,000
Metres

Figure 1: Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap



Legend

- | | |
|---|---|
|  Subject Land |  FireTrail |
|  Adjoining Lots |  Lots |
|  Building Envelope |  Watercourse |



Date: 6/09/2019

0 25 50 100

Metres

Figure 2: Concept Plan

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

2 Assessment requirements

The subject land and adjoining properties are identified as 'bushfire prone land' on the Shellharbour Bushfire Prone Land Map as shown on Figure 3. When investigating the capability of bushfire prone land to be rezoned, submissions must have regard to Section 9.2 Direction 4.4 – 'Planning for Bush Fire Protection' of the *Environmental Planning and Assessment Act 1979*. The objectives of Direction 4.4 are:

- *To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas; and*
- *To encourage sound management of bushfire prone areas.*

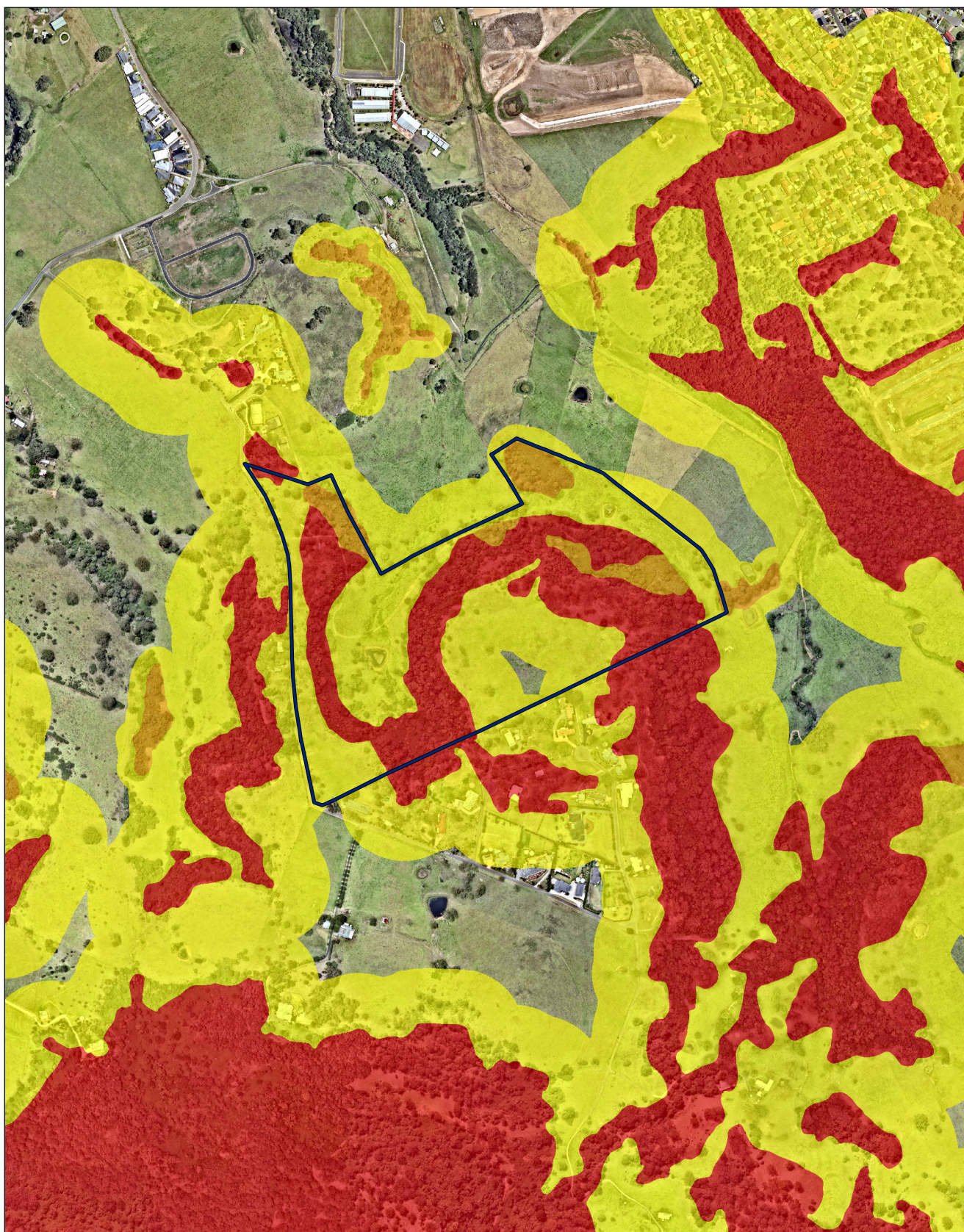
Direction 4.4 instructs councils on the bushfire matters which need to be addressed when drafting and amending Local Environmental Plans (LEP). They are as follows:

- *A draft LEP shall:*
 - *have regard to the document Planning for Bushfire Protection 2006;*
 - *introduce controls that avoid placing inappropriate developments in hazardous areas; and*
 - *ensure that bushfire hazard reduction is not prohibited within the asset protection zone.*
- *A draft LEP shall, where development is proposed, comply with the following provisions, as appropriate:*
 - *provide an asset protection zone incorporating at a minimum:*
 - *an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and,*
 - *an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road.*
 - *for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the draft LEP permit Special Fire Protection Purposes (as defined under Section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,*
 - *contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,*






- *contain provisions for adequate water supply for fire-fighting purposes,*
- *minimise the perimeter of the area of land interfacing the hazard which may be developed,*
- *introduce controls on the placement of combustible materials in the Inner Protection Area.*

The need for Planning Proposals to comply with '*Planning for Bushfire Protection 2006*' (referred to as PBP throughout this report) is called up by Direction 4.4. The Direction 4.4 provisions are specified within PBP as well. The relevant sections of PBP as they apply to the proposal are summarised below:

- PBP Section 2.1 – describes the submission requirements for rezoning proposals. The requirements do not differ from Direction 4.4.
- PBP Section 4.1 – outlines the specific objectives (Section 4.1.2) and assessment requirements (Section 4.1.3) for residential subdivision.



Legend

- | | | | |
|---|-----------------------|---|-----------------------|
|  | Subject Land |  | Vegetation Category 2 |
| Bush Fire Prone Land | |  | Vegetation Category 3 |
|  | Vegetation Category 1 |  | Vegetation Buffer |



Date: 12/12/2018

0 50 100 200
Metres

Figure 3: Bushfire Prone Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

3 Bushfire hazard and risk

3.1 Bushfire hazard

An assessment of the hazard surrounding and within the subject land is necessary to determine the suitability of the proposed future land use as well as the required bushfire protection measures, such as Asset Protection Zones, that may be required between future dwellings and bushfire hazards. The bushfire hazard is a combination of vegetation and slope determined in accordance with methodology specified by PBP.

3.1.1 *Predominant vegetation (fuels)*

The vegetation within 140 m of the subject land has been assessed in accordance with the methodology specified by PBP. Figure 4 maps the current distribution of the bushfire hazard as surveyed by Ecoplaning (2018).

The hazard consists of a partially cleared (underscrubbed) or weed-affected vegetation complex along the steep slopes of the surrounding gullies. Taking on varying forms depending on aspect and elevation (soils), the vegetation is predominantly 'Whalebone Tree - Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion' (PCT 1300). The rainforest grades into 'Forest Red Gum – Thin-leaved Stringybark Grassy Woodland on Coastal Lowlands, Southern Sydney Basin' (PCT 838) at the top and base of the slope.

The vegetation class and formation of the Forest Red Gum community is 'Coastal Valley Grassy Woodlands' and 'Grassy Woodlands', respectively. However, in this region, the community can take on a variety of forms including grassy woodland on the more exposed slopes, rainforest on the sheltered slopes and gullies, and forest in between. The community forms a component of the Illawarra Lowlands Grassy Woodland Endangered Ecological Community (EEC) and often contains pockets of the Illawarra Subtropical Rainforest EEC.

3.1.2 *Slopes influencing fire behaviour*

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most influence fire behaviour where the hazard occurs. The slope was determined using a 2 m contour layer as shown on Figure 4.

The slope is predominantly the steep upslopes and downslopes associated with the escarpment that runs through the subject land. The slope classes are indicated on Figure 4.

3.2 Bushfire threat

Beyond the subject land, the bushfire threat is assessed to be low to medium due to the hazard being confined to the gully walls, smaller remnants and riparian zones, as well as the predominance of managed land uses beyond (predominantly grazing land and rural residential properties). The bushfire hazard is confined to the steeper lands and drainage lines where

grazing practices have ceased, creating a patchy hazard that is not well-connected to rainforest and forests of Stockyard Mountain to the south.

3.3 Bushfire risk

Assessing the impact of bushfire is often better addressed by measuring risk. Bushfire risk is defined (Illawarra Bushfire Risk Management Committee 2017) as the chance of a bushfire igniting, spreading and causing damage to assets of value. Therefore, risk is analysed not only in terms of the existence of an adjacent hazard, but also the potential for ignition, fire spread, but also factors contributing to fire control and response. The Illawarra Bushfire Risk Management Plan (Illawarra Bushfire Risk Management Committee 2017) doesn't place a risk ranking on the proposed rezoning area due to the current lack of existing assets, as well as the absence of landscape-wide fire within the surrounding area of the coastal plain since recorded history. A risk rating of future residential development at the subject land would be low, as although the risk profile may increase with the introduction of life and property into the area, there will be compliant bushfire protection measures in accordance with PBP. Required measures to achieve compliance are discussed in the following Section 4 – 'Addressing Compliance'.



Legend

- Subject Land
- Contour - 2m
- Adjoining Lots
- Building Envelope
- Fire Trail
- Lots
- Watercourse
- Endangered Ecological Community

Vegetation Formation

- Forest
- Low Hazard
- Rainforest

Validated Vegetation (Ecolplanning 2018)

- Dam
- Exotic Grassland - Cleared
- Forest Red Gum - Disturbed/Shrubby

- Forest Red Gum - Scattered Paddock Trees
- Forest Red Gum - Underscrubbed
- Sydney Blue Gum - Disturbed/Shrubby
- Weeds and Exotics
- Whalebone Tree - Disturbed/Shrubby
- Whalebone Tree - Scattered Paddock Trees



Date: 6/09/2019

0 50 100 200
Metres

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

Figure 4: Bushfire Hazard Analysis

4 Addressing compliance

This section details how compliance with the assessment requirements listed in Section 2 is addressed. The response to requirements is set out following the structure of Direction 4.4, followed by PBP. There is reiteration of requirements between Direction 4.4 and PBP; in these cases, the relevant report subsection is referred to for the appropriate response.

4.1 Direction 4.4

The objectives of Direction 4.4 can only be satisfied once the provisions are achieved. Demonstration of achieving the provisions is provided below. A statement of how the objectives are achieved is listed below also:

“To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas”

The intention of the objective is to avoid a development outcome that is faced by or poses a risk that cannot be managed to an acceptable level. The assessment of ‘incompatible’, ‘inappropriate’ and ‘acceptable’ is a subjective one, and one that is not defined within the legislation or related policy.

To guide an assessment, reference should be made to the measures specified by *Planning for Bushfire Protection 2006* (see Section 4.1), such as the ability to establish and maintain an adequate Asset Protection Zone (APZ), and the assurance of acceptable access and evacuation.

The hazard and risk analysis within this report (Section 3) demonstrates that future residential development at the site will be faced by a risk that can be managed to an acceptable level by implementing the recommendations therefore making it compatible with the surrounding environment.

It is concluded that the proposed land use is not considered incompatible with the surrounding bushfire prone area. Compliant APZs coupled with adequate access designed to address the bushfire risk produces a use not incompatible with the surrounding environment.

“To encourage sound management of bushfire prone areas”

The recommended bushfire protection measures demonstrate sound management of the use of the subject land for the intended use.

The provisions and how they are to be addressed are as follows:

“have regard to Planning for Bushfire Protection 2006”

Addressing this provision is detailed in the following Section 4.2.

“introduce controls that avoid placing inappropriate developments in hazardous areas”

The proposed land use is not considered inappropriate nor is the area determined to be hazardous (refer to Section 3). Controls (bushfire protection measures) will be set in place commensurate with the level of risk for any future development. These controls would comply with PBP as set out in Section 4.2.

“ensure that bushfire hazard reduction is not prohibited within the asset protection zone”

It is intended that APZs will be confined to land zoned for residential development and not environmental protection. APZs will be placed within road reserves and maintained land such as residential lots and designated open space so that they can be maintained without conflicting with ecological objectives, such as those associated with riparian zones or any proposed E2 zoning.

“provide an asset protection zone incorporating at a minimum:

an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and,

an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road”

APZs suitable for residential subdivision are shown on Figure 5 and detailed in Section 4.2.

“for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the draft LEP permit Special Fire Protection Purposes (as defined under Section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with”

The proposal is not ‘infill development’.

“contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks”

Future development will feature a two-way road network to service residential lots. Addressing this provision is detailed in the following Section 4.2.

“contain provisions for adequate water supply for fire-fighting purposes”

Addressing this provision is detailed in the following Section 4.2.

“minimise the perimeter of the area of land interfacing the hazard which may be developed”

A proportion of the vegetation on the subject land will be cleared or modified to allow future subdivision in accordance with the concept layout shown in Figure 2. Any remaining vegetation will be rainforest and woodland within the subject land, as well as adjoining forest and rainforest to the west and south.

“introduce controls on the placement of combustible materials in the Inner Protection Area”

Section 4.2 details the how the site and any APZs are to be maintained.

4.2 Planning for Bushfire Protection 2006 (PBP)

Compliance with *Planning for Bushfire Protection 2006* (PBP) is achieved by addressing the standards for bushfire protection. The standards consist of ‘Acceptable Solutions’ and corresponding ‘Performance Criteria’ for the provision of APZs, access and services (water supply). Discussion on the standards and statements on how each protection measure can be complied with are listed in the subsections below.

4.2.1 Asset Protection Zones (APZ)

Using the hazard parameters of vegetation and slope discussed in Section 3, APZ distances have been estimated and are shown on Figure 5. The APZ dimensions are based on the draft document ‘Planning for Bushfire Protection 2018’ (PBP 2018) as subdivision of the subject land would occur after September 2019 when the draft document becomes legislated. The APZ distances specified within PBP 2018 exceed those specified within PBP 2006 for the vegetation types present, therefore achieving compliance with Direction 4.4.

The APZ mapping on Figure 5 is an estimation of what would be required for future subdivision based on the planned retention of vegetation. The vegetation proposed to be retained on the steep slopes is predominantly rainforest and woodland (heavily infested with weeds and exotics) and would act as the hazard if left remaining after development occurs.














A 30 m and 32 m APZ would be required along the top of the slope for the rainforest and woodland community, respectively. An 11 m APZ would be required along the base of the slope for the retained rainforest community. An APZ is also required from the western and southern sides of the subject land whereby rainforest and forest hazard are located off site. To the west, the APZ is measured from the western side of Cooby Road and associated existing development and managed lands. To the south, the APZ is measured from the managed lands, whereby much of the Forest Red Gum community is underscrubbed and grazed up to the edge of the steep slope where the rainforest commences.

APZs will need to be maintained to achieve the performance requirements of an Inner Protection Area (IPA) as specified by PBP. The following guide can be used:

- Canopy treatment: The tree canopy is to be discontinuous with gaps between crowns of at least 2 to 5 m. Small clumps of trees can remain forming one larger crown providing larger gaps to the next adjacent crown of minimum 5 m is achieved.
- Understorey treatment: Shrubs, saplings and understorey vegetation should not be within the APZ.
- Groundcover treatment: Groundcovers such as grasses are to be regularly mowed or slashed to minimal height (i.e. 100 mm), and ground fuels are to be maintained in a minimal state by removing all dead vegetative material by raking and removing leaf litter and other fine fuels such as sticks and fallen dead-wood.



Legend

	Subject Land	Asset Protection Zone - PBP 2018	
	Adjoining Lots		
	Building Envelope		Asset Protection Zone - 11m
	FireTrail		Asset Protection Zone - 18m
	Lots		Asset Protection Zone - 23m
	Watercourse		Asset Protection Zone - 30m
	Riparain Zone		
	Retained Vegetation		Asset Protection Zone - 45m



Date: 6/09/2019



Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

Figure 5: Asset Protection Zone

4.2.2 Access

Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response. All bushfire prone areas should have an alternate access or egress option depending on the bushfire risk, the density of the development, and the chances of the road being cut by fire for a prolonged period.

Future subdivision at the base of the slope will have multiple access points to the north and east away from the hazard into the adjoining stages of development. Similarly, lots along Cooby Road to the west will have alternate access. The lots at the top of the slope within the centre of the subject land have one access point leading to the north, which is considered to be acceptable in this case given that the hazard remaining would be a narrow corridor of rainforest, reducing the chance of the road being severed by the impacts of fire. The length of road through the hazard will be less than 100 m. An emergency access fire trail is also proposed in the east direction to provide an alternate thoroughfare.

Perimeter access

The low density residential zones (smaller lots) are to have perimeter subdivision roads at the hazard interfaces, as shown on Figure 5. It is acceptable for the larger lots within the rural interface and environmental living zones not to have a public perimeter road due to the larger size of the lots and location on steeper lands, making additional road construction unfeasible.

Design and construction standards

The proposed subdivision roads are to be designed in accordance with the PBP acceptable solutions for the design and construction of public roads in bushfire prone areas (see Table 1 on the following page). Minimum carriageway widths are 6.5 m for non-perimeter roads and 8 m for perimeter roads.

4.2.3 Water supply for fire-fighting

Future development will require fire hydrants to be installed to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

Table 1: Design and construction for public roads

Performance Criteria	Acceptable Solutions
<ul style="list-style-type: none"> • Firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources) 	<ul style="list-style-type: none"> • Public roads are two-wheel drive, all weather roads
<ul style="list-style-type: none"> • Public road widths and design that allows safe access for firefighters while residents are evacuating an area 	<ul style="list-style-type: none"> • Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with PBP Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle), which is a minimum of 6.5 metre carriageway for two-way road with inside edge curve radius >100 and swept path 2.5 metres. • The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas • Traffic management devices are constructed to facilitate access by emergency services vehicles • Public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard • Curves of roads (other than perimeter roads) are a minimum inner radius of six metres • Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient • There is a minimum vertical clearance to a height of four metres above the road at all times
<ul style="list-style-type: none"> • The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles 	<ul style="list-style-type: none"> • The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating
<ul style="list-style-type: none"> • Roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered 	<ul style="list-style-type: none"> • Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression • Public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression
<ul style="list-style-type: none"> • There is clear access to reticulated water supply 	<ul style="list-style-type: none"> • Public roads up to 6.5 metres wide provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression • One way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression
<ul style="list-style-type: none"> • Parking does not obstruct the minimum paved width 	<ul style="list-style-type: none"> • Parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement. No services or hydrants are located within the parking bays • Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road

5 Conclusion and recommendations

The information presented in this Bushfire Assessment Report demonstrates that the proposal to rezone the subject land for future residential subdivision can satisfy the Ministerial Direction No. 4.4 – ‘Planning for Bush Fire Protection’ and the requirements of *Planning for Bush Fire Protection 2006*. This is achieved by providing compliant bushfire protection measures such as hazard separation and adequate access.

The proposal is not considered incompatible with the surrounding environment and bushfire risk. With sound bushfire management, the proposal can coexist within the rural setting which is assessed to present a low to medium bushfire risk.

Bushfire protection measures for future residential development recommended within this report to achieve the requirements are listed below:

- Provision of compliant APZs between future building envelopes and bushfire hazards, which will likely consist predominantly of corridors of rainforest and woodland within the subject land, and rainforest and forest adjoining the subject land to the west and south.
- Adequate access for emergency response and evacuation.
- Compliant road widths and design.
- Perimeter subdivision roads between low density lots and identified hazards.
- Adequate water supply to allow fire-fighting operations by fire authorities.



David Peterson



References

Ecoplanning 2018. *Ecological constraints assessment, Lot 240 DP 828854 (105 Cooby Road, Tullimbar)*. Letter prepared for Tullimbar Heights Pty Ltd, December 2018.

NSW Rural Fire Service 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. Australian Government Publishing Service, Canberra.

NSW Rural Fire Service 2018. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and Developers*. Pre-release edition August 2018.

Illawarra Bushfire Management Committee (IBMC) 2017. *Bushfire Risk Management Plan*. Prepared by the IBMC pursuant to section 52 of the Rural Fires Act 1997.

