BUSH FIRE ASSESSMENT REPORT

HGBE Properties Pty Limited
256 Paterson Road
Bolwarra

PREPARED BY:

PEAK LAND MANAGEMENT

SEPTEMBER 2024

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

PEAK LAND MANAGEMENT

Land management consulting services:

-Bush Fire- **-Ecological-** **-Environmental-**

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Cover Photo: View of subject site.

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FIGURES AND TABLES

Document History

Document Id.	Prep. Date	Version	Submitted to:
Bush Fire Assessment Report	1.7.24	1	HGBE Properties Pty Ltd
Bush Fire Assessment Report	4.7.24	2	HGBE Properties Pty Ltd
Bush Fire Assessment Report	16.7.24	3	HGBE Properties Pty Ltd
Bush Fire Assessment Report	11.9.24	4	HGBE Properties Pty Ltd

AUTHOR DETAILS

Ted Smith is the director of PEAK LAND MANAGEMENT. He is a qualified Land Management Consultant with a Bachelor of Science Honours Degree in Physical Geography. He has over 25 years experience commercially consulting with PEAK LAND MANAGEMENT PTY LTD and working within state government.

Ted has completed a Graduate Diploma in Design for Bush Fire Prone Areas from the University of Western Sydney and is a member of the Fire Protection Association of Australia (FPA of Australia), being a BPAD Accredited Bush Fire Practitioner Level 3.

CERTIFICATION

Ted Smith of PEAK LAND MANAGEMENT has carried out a Bush Fire Assessment including a site inspection on the subject property. A detailed Bush Fire Assessment Report is attached which includes the submission requirements set out in *Planning for Bush Fire Protection 2019* together with recommendations as to how the relevant specifications and requirements are to be achieved.

I hereby certify, in accordance with Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in Bush Fire Risk Assessment; and

2. Note bush fire modelling & an alternate access arrangement has been used which is considered to be performance-based, and therefore not considered to be complying with the specifications and requirements of *Planning for Bush Fire Protection, 2019* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*. This report addresses the intent of PBP, 2019 with an alternate solution provided.

11th Sept, 2024

Signature Date

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

1.0 INTRODUCTION

PEAK LAND MANAGEMENT has been engaged by HGBD Properties Pty Ltd to prepare a Bush Fire Assessment Report for a proposed residential subdivision over land located at Lot C DP 163627 / 256 Paterson Rd, Bolwarra (referred to hereafter as "subject site").

Figures 1-4 & 6 show the subject site location, topographic map, and proposed development site plans, and Appendix 1 shows photos of the subject site.

Under the *Environmental Planning and Assessment Act, 1979* (and its regulations), and the *Rural Fires Act 1997* (and its regulations), councils are required to assess and control new developments in Bush Fire prone areas. This land has been assessed as being part of a Bush Fire Prone Area as mapped by Council (Figure 10).

This subdivision development falls under Section 100B of the *Rural Fires Act 1997* (and its regulations) for the subdivision which requires integrated development approval/ Bush Fire Safety Authority from the Rural Fire Service. PBP 2019 states that a residential subdivision falls under Section 100B of the Rural Fires Act. It should have required Asset Protection Zones, adequate access, water, and services as stated under the Act.

For the construction of a subdivision specific provisions exist as stated in PBP, 2019, Section 8.2.1. *"This includes ensuring an APZ based on a radiant heat threshold of 29kW/m² for any new dwellings, along with suitable provision for construction, access, water and landscaping".*

An alternate or performance-based solution is presented in this case as the development has been modelled using Bush fire Modelling data from NBC Bush fire Attack Assessment Report V4.1 under PBP,2019 Appendix B- Detailed Method 2, and alternate access arrangements.

As a result this application must be referred to the NSW Rural Fire Service for their approval.

Note: Consultation by phone has been undertaken with NSW RFS regarding this proposal (Rohini Belapurkar). The issue of no secondary road was discussed and due to a number of mitigating factors was not considered necessary. These include safe access /egress to Paterson Rd which once DA approved /clearing approved as not over or surrounded by Forested bush fire prone land being cleared land within 50m of road, surrounding managed lands (except to the north and west which will have limited low risk Forest hazards remaining after this development site is cleared), wide 8m carriageway road with turning circle, and zoning (R5) including surrounding R5 zoned lands which are likely to be developed in the future, a performance based solution is presented which addresses/meets the performance criteria stated within PBP, 2019 "*firefighting vehicles are provided with safe, all-weather access to structures*".

1.1 SCOPE OF WORKS

The proposal is for:

- 1 into 13 lots being large lot (R5), and one community title lot (14 in total) residential community title subdivision.
- Associated building envelopes & Asset Protection Zones over each proposed residential Lot.
- Access roads.
- Existing dwelling to be demolished.
- Retained vegetation over each lot to be conserved under a Covenant and protected. It is therefore treated as a hazard within this report.
- A BDAR has been undertaken for the proposal.

Figure 1a: Aerial photo showing subject site (imagery from Lands Department). North to top of all images.

Figure 1b: Aerial photo showing subject site & lots to north (imagery from Lands Department).

Figure 2: Aerial photo showing subject site (imagery from Nearmap).

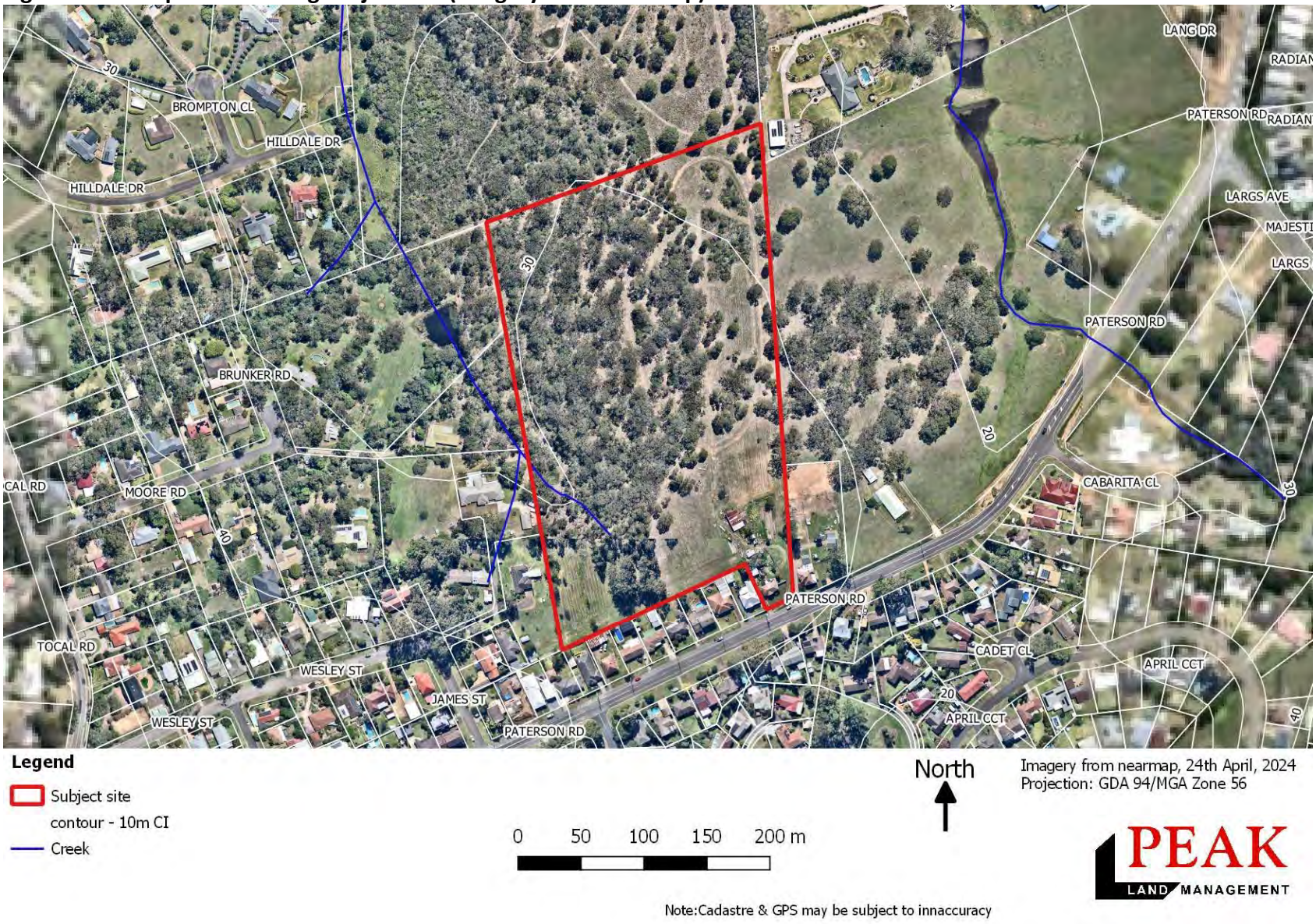
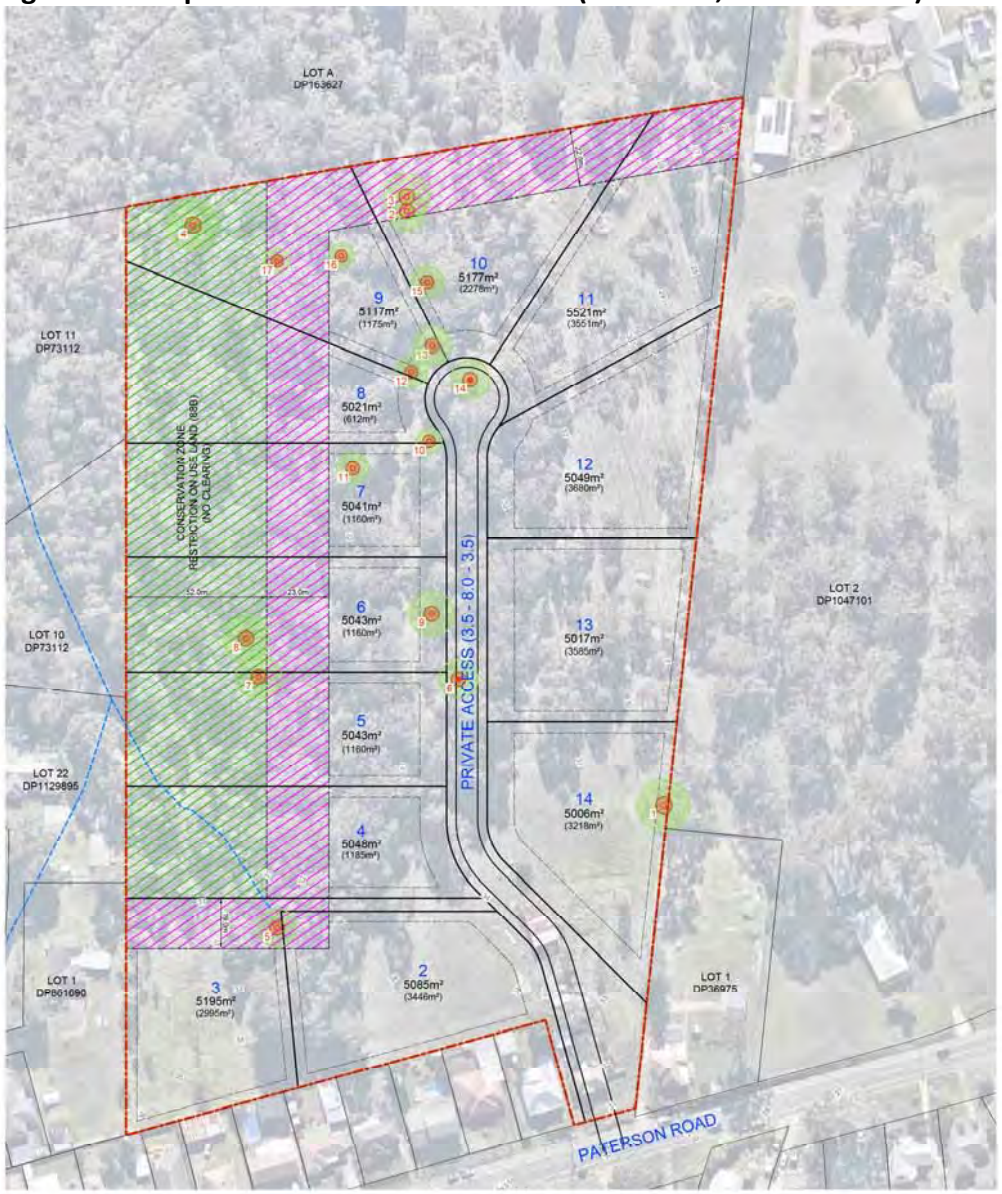


Figure 3: Topographic map showing subject site (imagery from Lands Department)

Figure 4a: Proposed residential subdivision (from GCA, dated 20.8.24)

Figure 4b: Proposed residential subdivision (from GCA, dated 20.8.24)



LEGEND

- APZ (19m, 22m & 23m)
- CONSERVATION ZONE - RESTRICTION ON USE LAND (888) (NO CLEARING)
- HOLLOW BEARING TREE (TO REMAIN)
- HOLLOW BEARING TREE (TO BE REMOVED)
- HOLLOW BEARING TREE STRUCTURAL ROOT ZONE
- HOLLOW BEARING TREE TREE PROTECTION ZONE
- EXISTING SURFACE CONTOUR - MAJOR (1m INTERVAL)
- EXISTING SURFACE CONTOUR - MINOR (0.2m INTERVAL)
- PROPOSED SITE DEVELOPMENT
- MAPPED WATERCOURSE UNDER THE WATER MANAGEMENT (GENERAL) REGULATION 2018 (HYDROLINE SPATIAL DATA)

Rev	Description	Drawn	Date
6	ANNOTATED CONSERVATION ZONE	AS	09.09.24
5	REVISED BUILDING ENVELOPES	DB	20.08.24
4	REVISED BUILDING ENVELOPES	DB	15.08.24
3	MINOR UPDATE	AS	13.08.24
2	DIMENSIONS ADDED	DB	12.08.24
1	ORIGINAL ISSUE	DB	07.08.24

GCA ENGINEERING SOLUTIONS
A.B.N. 92 086 017 745
1 HARTLEY DRIVE (P.O. BOX 3337)
THORNTON NSW 2322
PHONE. 49641811

Project Title:
PROPOSED SUBDIVISION

Project Address:
256 PATERSON ROAD, BOLWARRA

Client:
HGBE PROPERTIES PTY LTD

Project Status:
CONCEPT

Drawing Title:
ENVIRONMENTAL OVERLAY PLAN

Project No	Revision	Drawing No
24126LD	6	LD02

Scale:
0 16 32 48 64m
1:800 (A1) 1:1600 (A3)

Figure 5: Zoning map (from NSW Planning Portal Spatial Viewer, 2024)

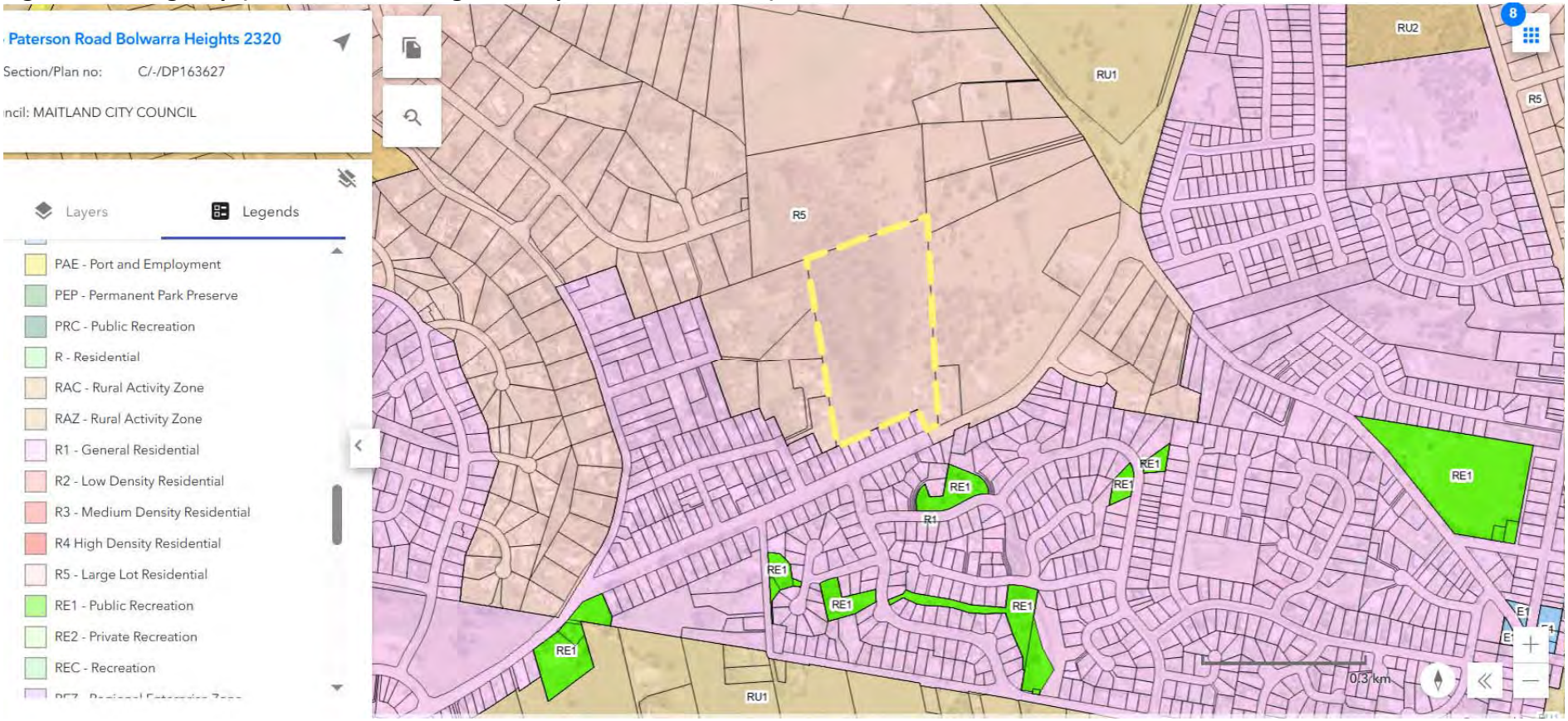


Figure 6: 2m contours over site & surrounds

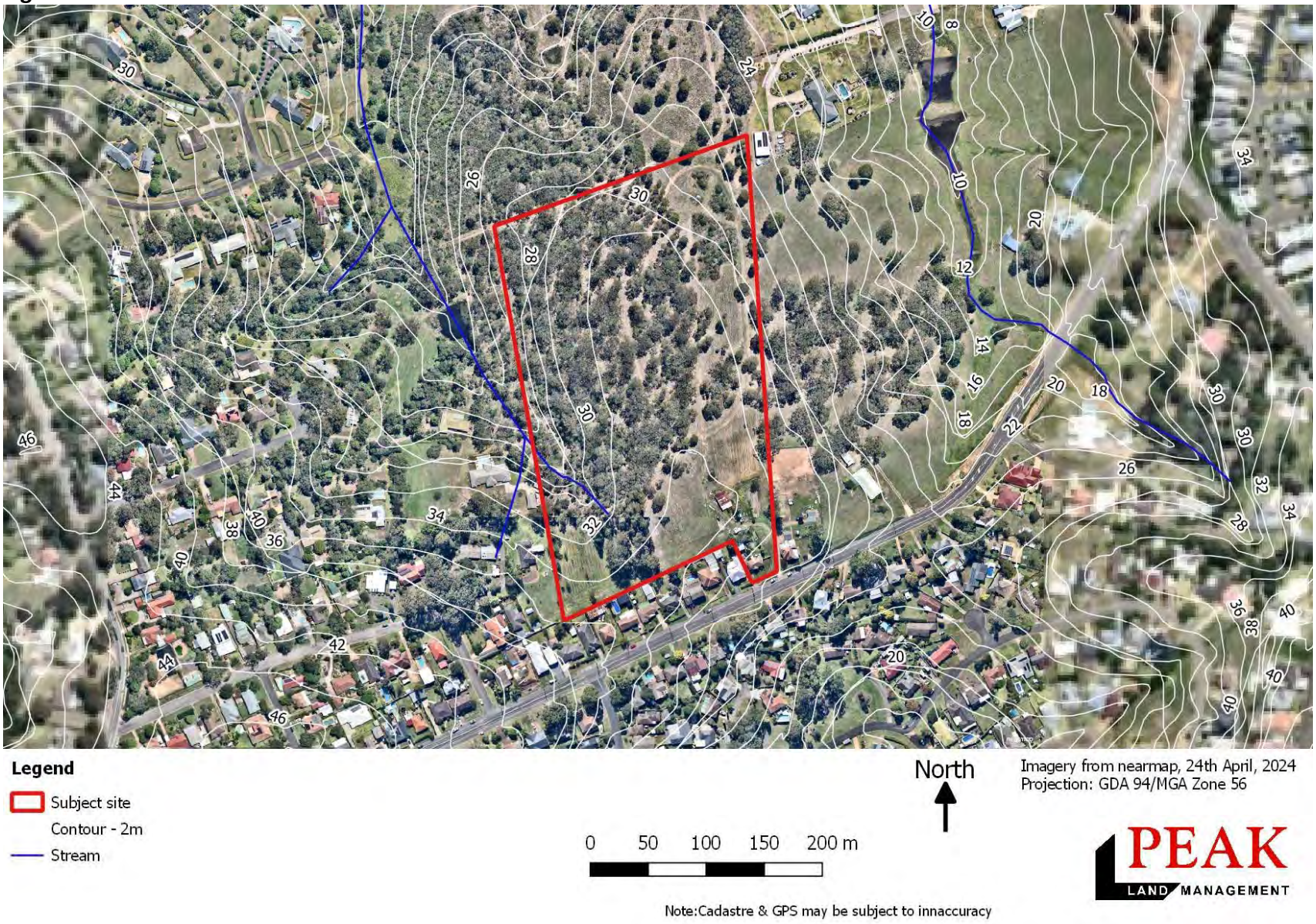


Figure 7: Vegetation class assessment (from NSW State Vegetation Type Map, 2023)

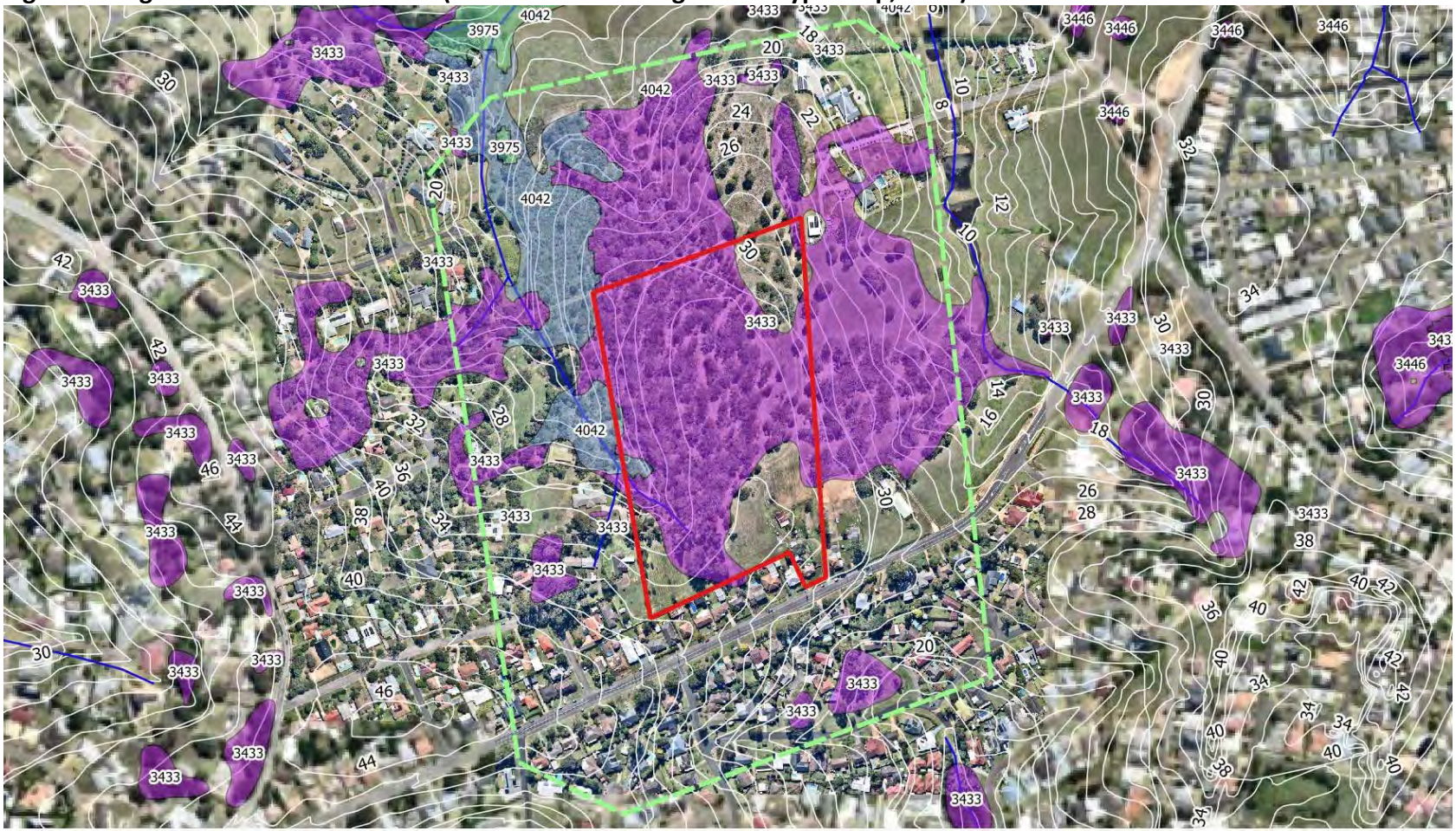


Figure 8: Vegetation class assessment by PEAK LAND MANAGEMENT

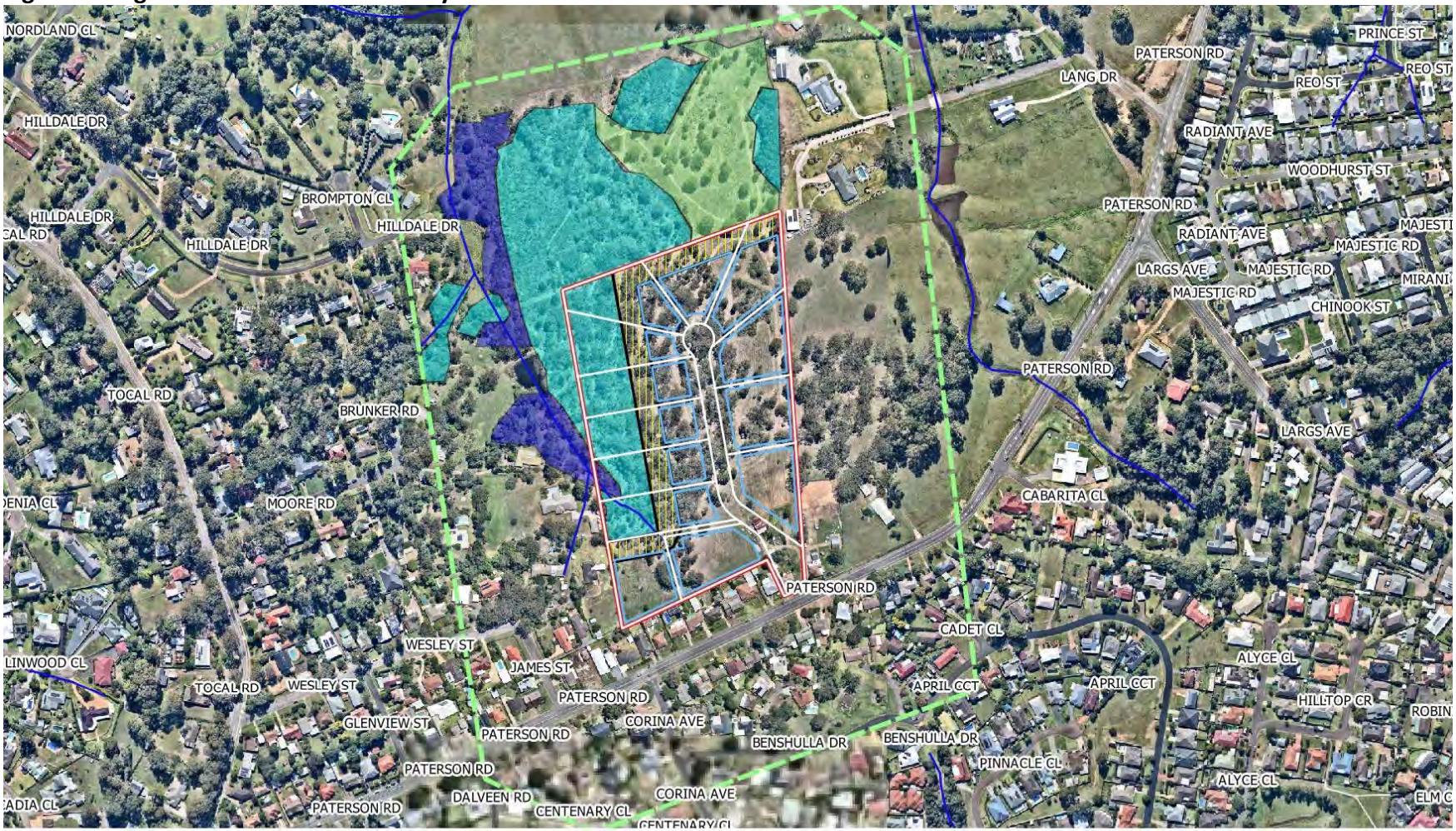


Figure 9a: Proposed subdivision with Asset Protection Zone

Figure 9b: Proposed Asset Protection Zone IPA & OPA

Figure 10: Bush Fire Prone Land Map (from NSW Planning Portal Spatial Viewer)

2.0 SITE DESCRIPTION AND SURROUNDING LANDUSE

The proposed large lot residential subdivision development is shown in Figure 4.

The site is located in a rural – residential area, on the edge of Bolwarra residential area. It is around 7.2Ha in extent, and Zoned R5- Large Lot Residential. A rural residential subdivision is located to the west, being predominantly managed land, and managed residential small lots to the south.

Unmanaged regrowth Forest & part managed cleared Grassland occurs to the north, and managed grazed land to the east.

The subject site is located in a residential infill area, zoned R5 (Fig 5) accessed from sealed public roads, with an internal two way no through road system.

3.0 VEGETATION

The predominant vegetation type within 140m is Hunter Macleay Forest, Coastal Floodplain Wetland, and Grassland assessed under either Comprehensive Vegetation Types/NSW State Vegetation Type Map, 2023 or PBP 2019 (Figure 8, Appendix 1 - photos).

Dry sclerophyll Hunter Macleay Forest occurs over the subject site, and over part western and northern surrounds of the subject site. Trees are up to 25m in height, with a shrub understorey. Unmanaged regrowth Forest & part managed cleared Grassland occurs to the north. Grass >100mm in height and assessed as Grassland in accordance with RFS policy/PBP, 2019.

Coastal Floodplain Wetland occurs along the creek lime to the west of the site. It has trees to 15m dominated by Swamp Oak and some scattered Eucalypts.

Managed grazed land occurs to the east. This area has scattered trees with grass <100mm in height being intensively grazed by cattle and horses and no mid or shrub storey present. All trees are smooth barked such as Spotted Gum. It is very unlikely to support a fire due to lack of fuel at ground level, and spaced tree cover equivalent to an Asset Protection Zone. This land has been grazed over a long period of time (>30 years).

Land to the south of the proposed subdivision is managed land.

4.0 SLOPE

Slope assessment has been carried out around the subject site under hazardous vegetation out to 100 metres as specified under the Guidelines Assessment Procedure. The angles have been measured in the field by an inclinometer.

PBP, 2019 states: - "*The effective slope is considered to be the slope under the vegetation which will most significantly influence the bush fire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be fully*

justified. Vegetation located closest to an asset may not necessarily be located on the effective slope".

Figure 7 shows 2m contour interval.

5.0 ENVIRONMENTAL FEATURES

All Hunter Macleay Forest over the subject site, is considered to be an Endangered Ecological Community – *Lower Hunter Spotted Gum Ironbark Forest*.

A BDAR (Biodiversity Development Assessment Report) has been undertaken by PEAK LAND MANAGEMENT. It found there was direct impact over this Endangered Ecological Community, hollow bearing habitat trees and threatened species including several microbat species, and Squirrel Glider, which were recorded over the site. Wildlife connectivity and patch size will also be reduced within this remnant patch surrounded by cleared land.

Building envelopes have been located near the proposed road to reduce clearing, with bush fire modelling used to reduce Asset Protection Zone extent. A covenant to protect remnant vegetation over each lot outside of the Asset Protection Zone, and protect most hollow bearing habitat trees (HBT), including subdivision redesign to avoid impact over most HBT's, has been adopted by HGBE Properties Pty Limited. Biodiversity Offset credits will be required to be paid for this development under the Biodiversity Conservation Act, 2016.

6.0 ABORIGINAL FEATURES

An Archaeological Due Diligence Assessment has been prepared for the site by McCardle Cultural Heritage Pty Ltd, 2024 for lodgement with the DA.

The report confirms '*that a search of the AHIMS register identified 24 known Aboriginal sites recorded within 2kms of the project area. There are no registered sites or Aboriginal places within the project area'*.

7.0 BUSH FIRE ASSESSMENT

The legislation as it relates to this site calls for asset protection zones (APZ) to be established around the proposed development, provision of adequate access, design staging and citing of the development and provision of appropriate water supply for bush fire fighting purposes.

7.1 Setbacks including asset protection zones

Table 1 shows the Bush Fire site assessment for the subject site. The Asset Protection Zone is shown in Fig 9a & 9b (IPA & OPA).

An Asset Protection Zone is required over the subject land under PBP 2019 (Table A1.12.2), to provide protection from possible bush fire attack from the hazard for the proposed residential dwellings. The Asset Protection Zone over the subject site will be located over each proposed lot and include managed electricity easements, & gardens/managed backyards.

Table 1: Bush Fire Site Assessment- FDI 100

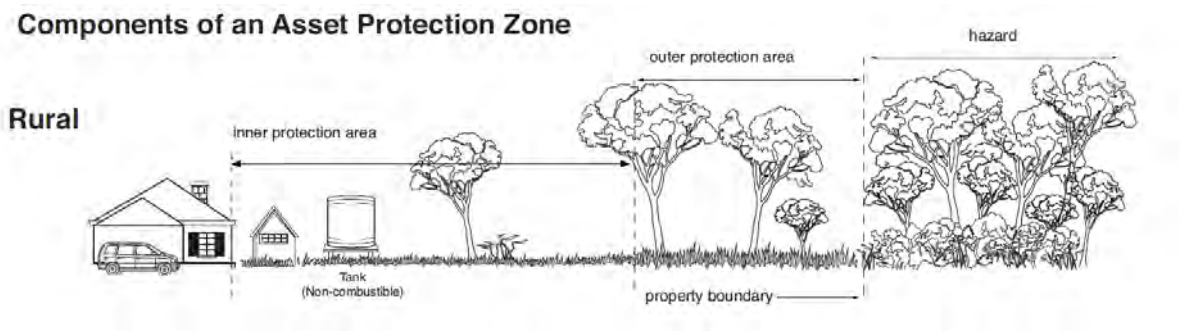
DIRECTION TO BUSH FIRE HAZARD	EFFECTIVE SLOPE	PREDOMINANT VEGETATION TYPE WITHIN 140m as per PBP 2019/Comprehensive Veg types*	Distance to hazard (from proposed BE)	Required minimum asset protection zone (from Table A1.12.2 PBP, 2019 or BF modelling results*)	BAL rating (from BF modelling)	<29kw radiant heat
West	7^0 downslope	*Hunter Macleay Dry Sclerophyll Forest	23m	23m* - IPA-18m, OPA-5m	BAL 29	√
North	6^0 downslope	*Hunter Macleay Dry Sclerophyll Forest	22m	22m*- IPA-17m, OPA- 5m	BAL 29	√
		Grassland	13m	13m -IPA	BAL 29	√
North (from proposed Lot 4)	3^0 downslope	*Hunter Macleay Dry Sclerophyll Forest	19m	19m*- IPA-15m, OPA-4m	BAL 29	√
East , south, part west (adjacent to Lot 4)	-	Managed Land	-	-		

Note: BAL refers to the maximum bush fire attack level expressed in kW/m^2 radiant heat flux exposure for the given slope, distance to hazard, and type of hazard (ie vegetation type and fuel load).

*An alternate or performance-based solution is presented in this case as the development has been modelled using Bush fire Modelling data from NBC Bush fire Attack Assessment Report V4.1 under PBP,2019 Appendix B- Detailed Method 2. See Appendix 2.

PBP 2019 defines an Asset Protection Zone within Appendix 4. A representation diagram is shown

Figure 11: Asset Protection Zone example (from PBP, 2006)



7.2 Water supplies and utilities

The subject site would be serviced by reticulated town water supplies, and will have fire hydrants. There are currently water mains and hydrants located over Paterson Road.

The proposal will provide adequate reticulated water supply, and fire hydrants to be provided in accordance with PBP 2019 & AS 2419.1-2005, including blue cats eyes markers and signage.

The development will be serviced by underground electricity, in accordance with PBP 2019.

7.3 Access

The proposed development would be accessed from Paterson Drive, by a property access road, complying with PBP, 2019 requirements. It is 360m in total length, with proposed cleared surrounds of at least 50m in all directions once clearing/DA approved. An easement along the eastern side of the subject site allows future access for any development over Lot A to the north of this site (Fig 1b & 4).

Paterson Road is a public two way sealed important regional/local crown road.

The main access road is regarded as a perimeter road, and will be an 8m wide sealed carriageway (with no parking allowed on road, to form part of the Community Title restrictions). This allows two way access/egress and conformation with PBP, 2019 requirements. A secondary access road is not proposed, as per discussion in Sect 1 & 8, with an alternate solution proposed.

7.4 Construction standards

The proposed dwellings would be constructed to the relevant BAL's dependant on their location and setback to hazard, as shown in Table 2. In this case all building envelopes comply to BAL 29 or lower construction, in accordance with PBP 2019 (Table A1.12.5).

7.5 Other fire protection measures

Recommendations are made below to address further non compulsory bush fire protection measures.

8.0 BUSH FIRE RECOMMENDATIONS

An alternate or performance-based solution is presented in this case as the development has been modelled using Bush fire Modelling data from NBC Bush fire Attack Assessment Report V4 under PBP,2019 Appendix B- Detailed Method 2.

The development will comply with PBP, 2019, with the exception of an alternate solution proposed for both Asset Protection Zones & access road:

- Serviced by reticulated water supplies- complies with PBP, 2019.
- Serviced by above & underground electricity power- complies with PBP, 2019
- Serviced by public road, and internal perimeter road, no secondary road – non compliant- alternate solution proposed- requires NSW RFS consent.
- Asset Protection Zone – Method 2 modelling/ alternate solution proposed- requires NSW RFS consent.
- Future dwellings shall comply with BAL 29 construction & setback (or less dependent on location) & AS 3959 & PBP, 2019 - complies with PBP, 2019.
- Landscaping- to comply with PBP, 2019.

Note: Consultation by phone has been undertaken with NSW RFS regarding this proposal (Rohini Belapurkar). The issue of no secondary road was discussed and subject to NSW RFS approval is considered to meet the intent & performance criteria stated within Sect 5.3b PBP, 2019 of PBP, 2019 being:

"*firefighting vehicles are provided with safe, all-weather access to structures*".

This is considered to be provided without the need for a secondary access road by:

- Safe access /egress to Paterson Rd which once DA approved /clearing approved is not over or surrounded by Forested bush fire prone land. Cleared managed land within 50m of proposed access road, & APZs to be provided over all building envelopes/surrounds as per Fig 9;
- Limited/low risk Forest hazard remaining after this development site is cleared;
- 8m wide carriageway road with turning circle, and with no parking allowed on road, to form part of the Community Title restrictions;
- High growth area, with Zoning (R5) including surrounding R5 zoned lands which are likely to be developed in the future; meaning virtually no Forest/hazard will exist in the future. Councils DCP shows a road network over this site and surrounds, showing their intent to allow development over the entire area, which would mean no or very little Forest remaining.

The following recommendations are made:

- **Design and Construction:** - The intent of measures is that buildings are designed and constructed to withstand the potential impacts of bush fire attack. To achieve this, the following conditions are recommended:
  - All nominated building envelopes comply to BAL 29 or lower construction as required by PBP, 2019.
  - Once lots are sold and specific individual site plans for each dwelling are developed/known then each may be assessed under separate Bush Fire Report/BAL Certificates.
  - The requirements of AS 3959-2018 apply in regards to dwelling/building construction, in accordance with the National Construction Code (NCC), except as modified by Section 7.5 of PBP, 2019.

- **Asset Protection Zone:** - The intent of measures is to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact. To achieve this, the following conditions are recommended:
  - At the commencement of building works and in perpetuity a variable width Asset Protection Zone should be provided/maintained to the required distances as shown in Figure 9 and Table 1. The APZ shall be managed to an Inner Protection Area Asset Protection Zone as outlined within Appendix 4 of Planning for Bushfire, 2019 (example in Fig 11). The Asset Protection Zone should be delineated on all plans, and a covenant or similar legal encumbrance placed over the land clearly showing its location and restriction upon title of land.

    PBP 2006 states the APZ "*should consist of mown grass, concrete, pavers, pebbles, small clumps of vegetation, isolated trees, etc. Lawns and garden should be maintained so that they do not become overgrown, vegetation does not grow over or touch the dwelling, and canopy of trees do not touch or become continuous with the surrounding bushland (at least 2-5 metres between tree canopies).*

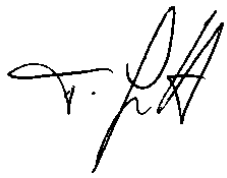
- **Access:-** The intent of measures is to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area. To achieve this, the following conditions should apply:
  - The perimeter road (ie main access road within development) shall comply with Table 5.3b, PBP 2019 requirements.

- **Water and Utilities: -** The intent of measures is 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. To achieve this, the following conditions should apply:
  - Water, electricity and gas shall comply with Table 5.3c of '*Planning for Bush Fire Protection 2019*', and fire hydrants provided that comply with AS 2419.1-2005.

- **Landscaping:** - Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.
  - All new fencing if within 6m of any proposed dwelling shall be non-combustible.
  - Landscaping to the site is to comply with the principles of Appendix 4 of 'Planning for Bush Fire Protection 2019'.

The bush fire risk is considered to be adequately managed through the recommendations made above, and meets PBP 2019, in conjunction with recommendations/approval conditions from the NSW Rural Fire Service/ Council.

Report prepared by:



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9.0 REFERENCES

Auld, BA & Medd, RW 1987, *Weeds.* Inkata Press.

Brooker, MIH and Kleineg, DA. 2019. *Field Guide to Eucalypts – South Eastern Australia, Volume 1.* Blooming Books.

Building Code of Australia.

Fairley, A and Moore, P. 2000. *Native Plants of the Sydney District*. Kangaroo Press

Keith, D., 2012. *Ocean shores to desert dunes: the native vegetation of NSW and the ACT*. NSW Department of Environment and Conservation.

NSW Rural Fire Service, 2014. *10/50 Vegetation Clearing Code of Practice*. State of NSW.

NSW Rural Fire Service, 2019. *SHORT FIRE RUN Methodology for Assessing Bush Fire Risk for Low Risk Vegetation*.

NSW Rural Fire Service, 2019. *Planning for Bush Fire Protection Guidelines*.

Robinson, L. 2003 (3rd ed). *Field guide to the Plants of Sydney*. Kangaroo Press.

Standards Australia AS 3959-2018. *Construction of buildings in Bush Fire prone area*.

Websites

www.rfs.nsw.gov.au
Lands Department- SIX Maps
Maitland City Council
Nearmap
https://geo.seed.nsw.gov.au/NSW_VegetationClass_5m

Bushfire Modelling

Bushfire Modelling data from NBC Bushfire Attack Assessment Report V4.1 under PBP, 2019 Appendix B- Detailed Method 2.

APPENDIX 1: PHOTOS OF SITE AND SURROUNDS

Paterson Rd to south of subject site.

Exisiting dwelling to be removed

Subject site looking north

Subject site looking north

Subject site looking north-west

Subject site looking west

Scattered Spotted Gums to east of subject site- managed grazed land.

Managed land to east of subject site –grazed by cattle & horses/ slashed regularly

Managed land to east of subject site –grazed by stock/slashed regularly

Grassland to north of subject site

Hunter Macleay Forest to north of subject site

Hunter Macleay Forest over subject site and to west of subject site

Managed land over proposed Lot 4, looking south-west

Managed land over and to south of subject site (proposed Lot 4)

Looking north from proposed Lot 4

Part managed land to west of subject site

APPENDIX 2: BUSH FIRE MODELLING RESULTS AND MAPPING

Parameters based upon:

- Hunter Macleay Dry Sclerophyll Forest as shown in Table 1 & veg mapping Fig 8.
- Default fascia elevation level.
- Flame temp: 1090.
- Modelling used only to north and west.

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 20/05/2024 **Assessment Date:** 20/05/2024

Site Street Address:	256 Paterson Rd, Bolwarra
Assessor:	Ted Smith; PEAK LAND MANAGEMENT
Local Government Area:	Maitland
Alpine Area:	No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: North

Vegetation Information

Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	6 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	14	**Overall Fuel Load(t/ha):**	24.6
Vegetation Height(m):	0.9	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	22

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1090

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100

Program Outputs

Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	8.6
Radiant Heat(kW/m2):	27.72	**Flame Angle (degrees):**	62
Flame Length(m):	19.47	**Maximum View Factor:**	0.435
Rate Of Spread (km/h):	2.54	**Inner Protection Area(m):**	17
Transmissivity:	0.839	**Outer Protection Area(m):**	5
Fire Intensity(kW/m):	32304		

Run Description:	North from Lot 4		
Vegetation Information			
Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	3 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	14	**Overall Fuel Load(t/ha):**	24.6
Vegetation Height(m):	0.9	Only Applicable to Shrub/Scrub and Vesta	
Site Information			
Site Slope:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	19
Fire Inputs			
Veg./Flame Width(m):	100	**Flame Temp(K):**	1090
Calculation Parameters			
Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	7.36
Radiant Heat(kW/m2):	27.37	**Flame Angle (degrees):**	64
Flame Length(m):	16.38	**Maximum View Factor:**	0.426
Rate Of Spread (km/h):	2.07	**Inner Protection Area(m):**	15
Transmissivity:	0.845	**Outer Protection Area(m):**	4
Fire Intensity(kW/m):	26264		

Run Description:	West		
Vegetation Information			
Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	7 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	14	**Overall Fuel Load(t/ha):**	24.6
Vegetation Height(m):	0.9	Only Applicable to Shrub/Scrub and Vesta	
Site Information			
Site Slope:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	23
Fire Inputs			
Veg./Flame Width(m):	100	**Flame Temp(K):**	1090
Calculation Parameters			
Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100
Program Outputs			
Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	9.12
Radiant Heat(kW/m2):	28	**Flame Angle (degrees):**	62
Flame Length(m):	20.65	**Maximum View Factor:**	0.44
Rate Of Spread (km/h):	2.72	**Inner Protection Area(m):**	18
Transmissivity:	0.837	**Outer Protection Area(m):**	5
Fire Intensity(kW/m):	34611		

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