



BUSHFIRE THREAT ASSESSMENT

FOR

REZONING PROPOSAL

AT

**40 RAYFORD STREET & 19 DAYDAWN
AVENUE, WARNERS BAY, NSW**

Prepared for: PULVER COOPER & BLACKLEY

June 2017

AEP Ref 1495



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1.0 Introduction

It is proposed to rezone part of lands at 40 Rayford Street, Warners Bay (Lot 6 DP 814499), and 19 Daydawn Avenue, Warners Bay (Lot 100 DP1173625) from E2 Environmental Conservation to R2 Low-density Residential. At the request of Pulver Cooper & Blackley (the client), Anderson Environment & Planning (AEP) have undertaken necessary investigations to prepare a Bushfire Threat Assessment (BTA) report addressing the proposed rezoning.

Lot 6 DP1173625 and Lot 100 DP1173625 (the study area) together total approx. 12.9 hectares (ha). The proposed rezoning area (the subject site) occupies approx. 5.8ha, most of which is cleared and/or has been extensively farmed or managed over a long period of time. Approx. 0.95ha of disturbed remnant native vegetation patches occurs within the lands proposed for rezoning, while approx. 6.72ha of lands will remain E2 - *Environmental Conservation* in accordance with Lake Macquarie City Council (LMCC) *East Munibung Hill Area Plan 2016*.

This report is specifically intended to assess the bushfire protection measures required by “*Planning for Bushfire Protection 2006*” (PBP) and the construction requirements of the proposed development in accordance with the provisions of the Building Code of Australia – Volume 2, Edition 2010 and Australian Standard 3959-2009 (AS 3959) – “*Construction of buildings in bushfire-prone areas*”.

As the proposed development will eventuate in residential subdivision, it is classed as ‘Integrated Development’ under Section 91 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). In combination with Section 100B of the *Rural Fires Act 1997* (RF Act), a Bushfire Safety Authority (BSA) is required from the Rural Fire Service (RFS) to enable the development to proceed. This report addresses the required heads of consideration relevant to obtaining a BSA.

For the purposes of referencing, this document should be referred to as:

Anderson Environment & Planning (2017). *Bushfire Threat Assessment for Proposed Rezoning and Residential Subdivision at 40 Rayford and 19 Daydawn Avenue, Warners Bay, NSW*. Unpublished report for PCB Surveyors, Newcastle NSW.



2.0 Site Particulars

- **Proposal Location** – 40 Rayford Street and 19 Daydawn Avenue, Warners Bay, NSW.
- **LGA** –Lake Macquarie.
- **Title Details** Lot 6 DP 814499 - 40 Rayford Street (Lot 6); and
Lot 100 DP 1173625 - 19 Daydawn Street (Lot 100).
- **Subject site** –the subject site are occupies E2 lands within the eastern (downslope) portion of both Lot 6 (approx. 4.8ha) and Lot 100 (approx. 1.0ha). The subject site totals approx. 5.8ha.
- **Study area** – Comprises the subject site and the remainder of the parent lots. The study area comprises approx. 12.9ha.
- **Zoning** – The subject site and upslope (western) lands of both lots are zoned E2 – Environmental Conservation (LMLEP 2014). A small portion in the south-east of Lot 6 is zoned R2 – Low Density Residential.
- **Current Land Use** – The study area presents as a mosaic of managed and grazed pastures, apiaries, orchards, gardens, and scattered, disturbed remnant vegetation. A dam occurs centrally within the downslope areas. An unmapped 1st Order Stream runs west to east near the southern boundary of 40 Daydawn Street (Lot 6) towards Lake Macquarie (see **Figure 1**).
- **Surrounding Land Use** – Land to the east includes the well-established suburb of Warners Bay, and the small area of remnant vegetation within Lot 6 that is zoned R2 and currently subject to a Development Application. Land to the north and west is zoned E2 – Environmental Conservation and is subject to LMCC “East Munibung Hill Area Plan”. This land consists of some remnant native vegetation, but areas have been subject to anthropogenic disturbance and management for agricultural and grazing purposes.






Figure 1 depicts the extent of the subject site and study area overlain with an aerial photograph of the locality.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information



Legend

Study Area

-  Lot 6 DP 814499
-  Lot 100 DP 1173625
-  Subject Site
-  Cadastre
-  1st Order Watercourse (Indicative)



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan

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Title: Figure 1 - Site Location

Date: 21.6.17

Location: Warners Bay

Client: PCB

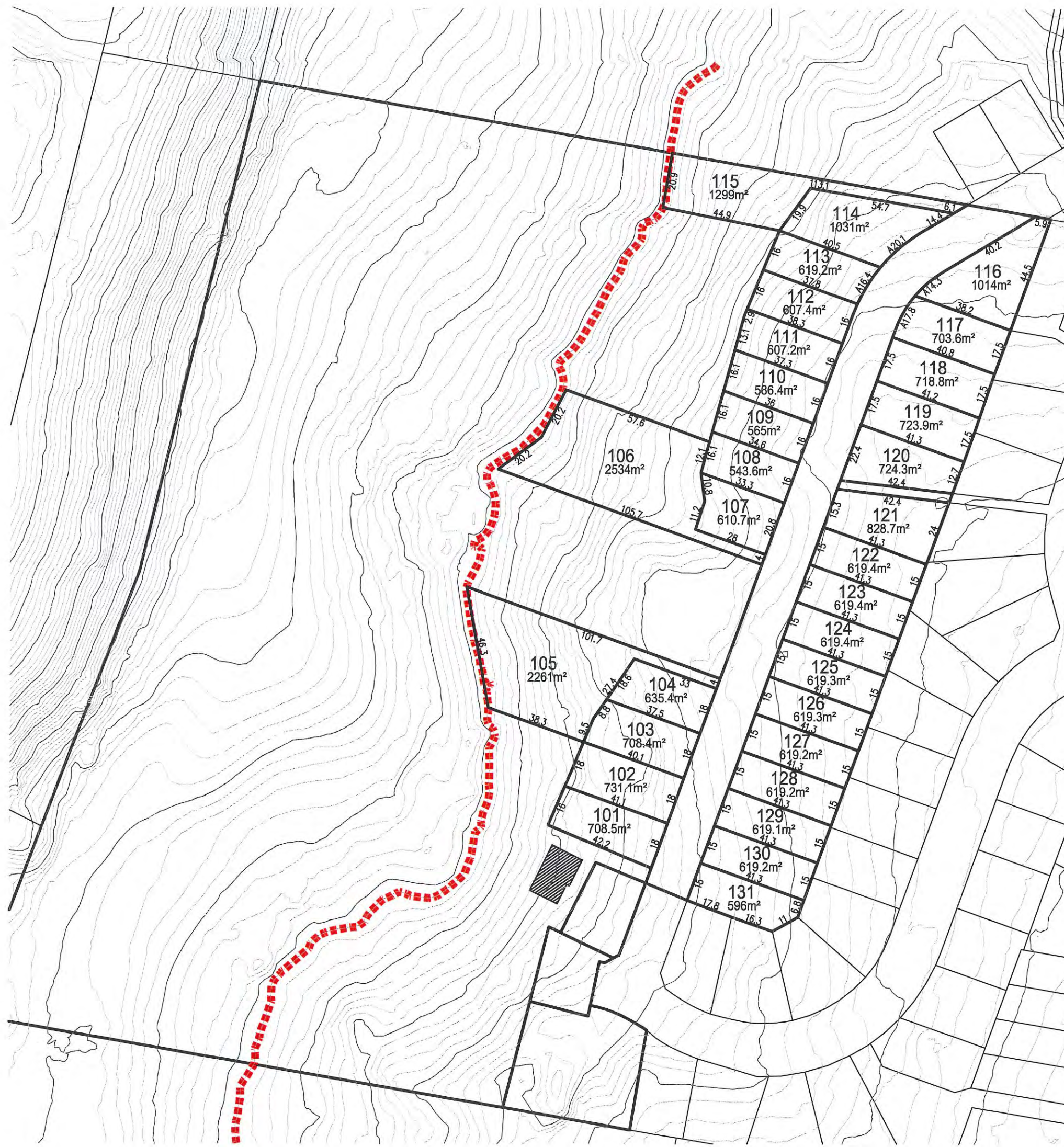
Our Ref: 1495

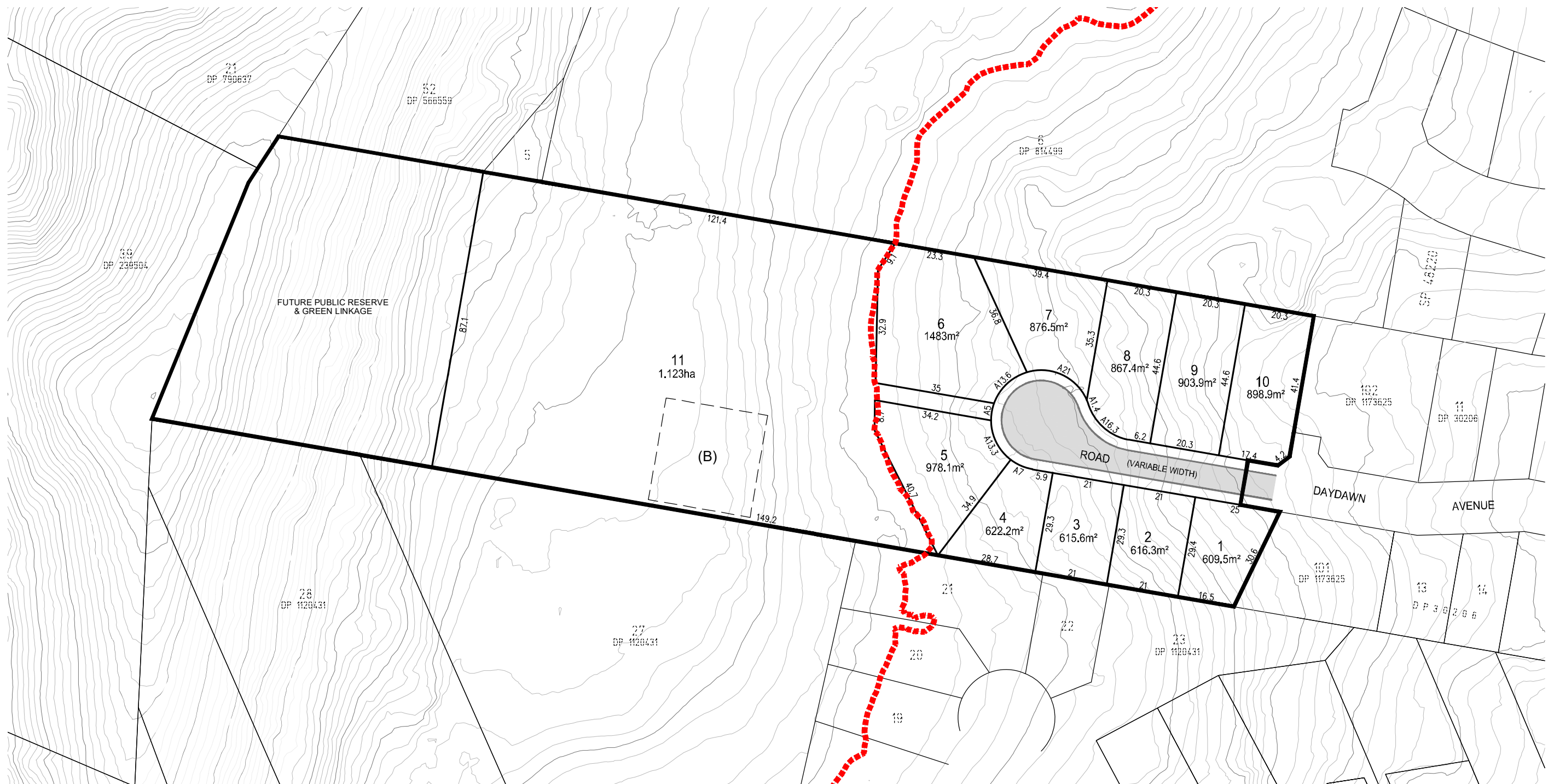


3.0 Proposed Development

The proposal involves the rezoning of approx. 5.8ha of land on the eastern side of the study area to allow the development of approximately 26 residential housing lots. The land that will be affected by the proposal has largely been managed and cleared, however some small patches of highly degraded remnant native vegetation remain, including riparian vegetation associated within the drainage line in the south-east of Lot 6 which will be retained as part of the proposal.

Figure 2 depicts the proposed development within the subject site.





■■■■■■■■■■ CONTOUR RL 54
(B) PROPOSED BUILDING ENVELOPE

10 5 0 10 20 30 40
Horizontal Scale 1:600 (A1)
1:1200 (A3)
14/06/2014 - 16/155



4.0 Bushfire Prone Land Mapping

Examination of LMCC Bushfire Prone Land (BPL) mapping (2011) confirms that the study area is mapped as “Bushfire Prone Land – Vegetation Category 1, Vegetation Category 2 and Buffer”. This designation has triggered the need for this BTA.

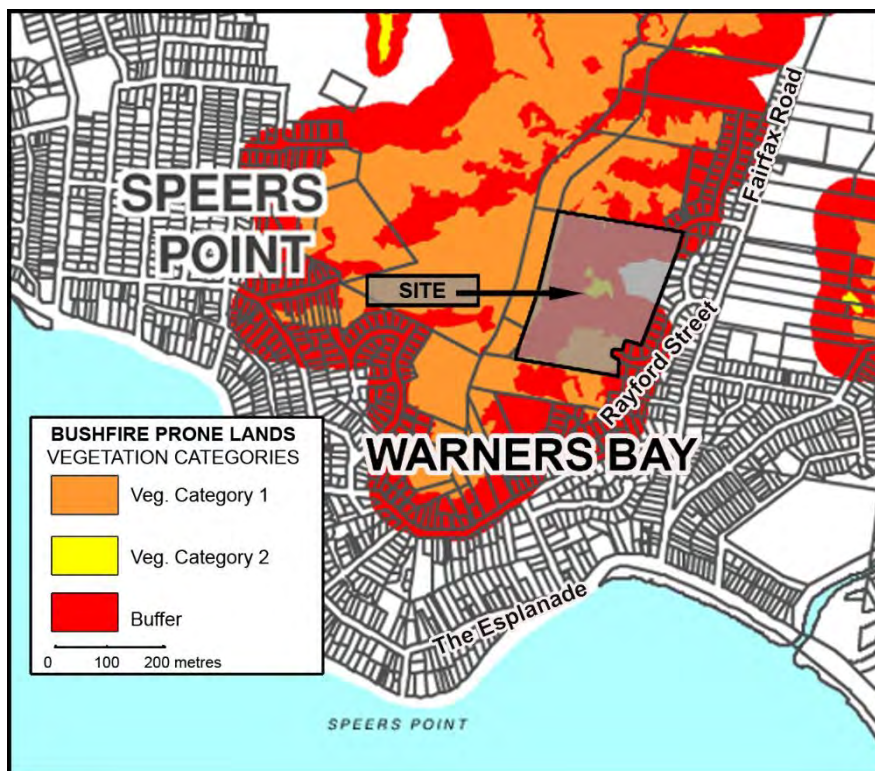


Figure 3 - Extract from LMCC Bushfire Prone Land Map (2011)

Appendix 3 of the PBP (2006) provides the steps required to determine the level of bushfire hazard that applies to the site. Factors influencing the hazard level include:

The formation of vegetation surrounding the site (as defined by Keith 2004);

- The distance between vegetation and the site (or proposed buildings therein);
- The effective slope for each patch of vegetation; and
- The Fire Danger Index (FDI) of the council area within which the development occurs.

These factors together provide an indication of the level of threat posed to the development from any vegetation retained within the site and surrounding vegetation in the event of a bushfire, and the required mitigation measures to be taken in the form of Asset Protection Zones (APZs) and building construction standards. These measures are detailed further in **Section 5**.



5.0 Bushfire Hazard Assessment

As outlined above. The identification of proximate hazards post development has resulted in the need for APZ's, and hence consideration of related construction standards.

5.1 Vegetation

The site and surrounds occurs within the Greater Hunter region, with existing vegetation subsequently classified with a Fire Danger Index (FDI) of 100 as per Appendix 2 of the PBP. Although the development seeks to minimise vegetation removal within the study area, all vegetation within the subject that occurs outside of the 20m wide strip of riparian vegetation (Vegetated Riparian Zone; VRZ) will be removed or modified to the extent that it no longer constitutes a hazard (i.e. will exist in a managed state akin to that of an APZ). Furthermore, vegetation within Lot 6 that occurs south-east of the subject site is zoned residential (R2), is currently managed as part of the front yard of the existing homestead (see photos in **Appendix A**), and is subject to a subdivision DA. This vegetation is likely to be removed as part of subdivision works, however the vegetation will be isolated and continually managed given the proximity to existing residences even if retained and, therefore, it is considered appropriate to remove the vegetation as a future hazard for this assessment.

Conversely, areas immediately west / upslope of the subject site are highly disturbed and largely devoid of vegetation, however the area has been slated by LMCC as a future rehabilitation corridor (LMCC 2014) to reflect its E2 zoning, and all areas west of the subject site have subsequently been assessed as 'Forest' vegetation as per the PBP. Within the subject site, the VRZ will remain post-development and will also constitute a potential hazard. Despite including a Eucalyptus overstorey that would otherwise constitute Forest vegetation under PBP, the riparian nature of the vegetation and narrow (20m) width allows for the vegetation to be classified as 'Rainforest' vegetation as per Section A2.3 of the PBP.

Vegetation as it applies to the proposed rezoning and indicative development is shown in **Figure 4**.

5.2 Slope Analysis

Examination of effective slope class for the relevant hazard areas reveals the study area slopes east towards Lake Macquarie. Site slope detail is presented in **Figure 4**.

The effective slope relevant to the hazards on and surrounding the subject site exists as:



- Flat / upslope towards current and future (rehabilitated) vegetation to the west of the study area. This slope is also considered to be of most influence for the VRZ as it extends upslope to the west.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information

Legend

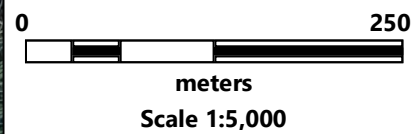
- Lot 6 DP 814499
- Lot 100 DP 1173625
- Subject Site
- Cadastre

Assessment Buffers

- 140m Vegetation Assessment
- 100m Slope Assessment
- 1st Order Stream (Indicative)
- 2m Contour

Vegetation

- Current / Future Hazard**
- Rainforest
 - Forest
 - Forest (Rehabilitated)
- Hazard to be removed**
- Forest (current subdivision DA)



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Title: Figure 4 - Vegetation and Slope Assessment

Location: Warners Bay

Client: PCB

Date: 21.6.17

Our Ref: 1495



5.3 Applicable Asset Protection Zones

Based on the information presented previously, the following derivation of APZs apply to the proposed development.

Fire Danger Index Rating = 100

Rainforest vegetation

- Effective slope – flat / upslope
- Required Minimum APZ – 10m

Forest vegetation

- Effective slope – flat / upslope
- Required Minimum APZ – 20m

Note that the derived APZ setbacks are based upon the need to conform to Level 3 construction as per AS 3959 for a building of Class 1 or 2 under the BCA. Construction standard options are discussed further in **Section 6.1**.

APZs as they apply to the subject site are provided in **Figure 5**.

5.4 Water Supply

It is expected that the development will be serviced by a reticulated water supply system extended from existing and proposed residential areas.

The reticulated water supply and street hydrant access will need to be delivered in accordance with AS 2419.1-2005.

5.5 Access and Egress

The proposed development will be predominantly serviced from Rayford Street and Daydawn Avenue via Fairfax Road to the east, and roads proposed within the subject site will need to comply with Section 4.1.3 of PBP 2006 to provide adequate access and egress arrangements.

Emergency response times would be expected to be prompt with NSW Fire Brigade Stations approximately 5km away in Teralba and Cardiff.



6.0 Bushfire Hazard Determination

6.1 Construction Standards – AS 3959-2009

As outlined above, the identification of proximate hazards post development has resulted in the need for APZ's, and hence consideration of related construction standards.

Bushfire Impact and AS-3959-2009

The Australian Standard 3959-2009 Construction of Buildings in Bushfire Prone Areas, details six (6) levels of BAL construction standards that are required for buildings, depending upon the expected impact of a bushfire from adjacent areas. These BALs are measured from the edge of the hazard and incorporate vegetation type and slopes (see above) to determine the relevant distance for each BAL rating (and associated construction standard).

The relationship between the expected impact of a bushfire and the BAL rating is provided in **Table 1** below.

Table 1 – BAL Construction Standard

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction standard under AS 3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL – 12.5
19	12.6 to 19.0	BAL – 19
29	19.1 to 29	BAL – 29
40	29 to 40	BAL – 40
Flame Zone	≥40	BAL – FZ (Not deemed to satisfy provisions)

Figure 5 depicts the BAL construction standards applicable for the proposed development. Specifically, these BALs are:

Rainforest vegetation – flat/upslope

- <8m: BAL - Flame Zone
- 8 to <11m: BAL – 40
- 11 to <16m: BAL – 29
- 16 to <23m: BAL – 19
- 23 to <100m: BAL – 12.5








Forest vegetation – flat/upslope

- <19m: BAL – Flame Zone
- 19 to <25m: BAL – 40
- 25 to <35m: BAL – 29
- 35 to <48m: BAL – 19
- 48 to <100m: BAL – 12.5






These BALs are to be adopted as the minimum requirement for each specific zone. Any lessening of these requirements would require reassessment to ensure increased APZ's are provided, or other acceptable mitigation measures are in place.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information




Legend

-  Lot 6 DP 814499
-  Lot 100 DP 1173625
-  Subject Site
-  Proposed Lot Layout
-  1st Order Stream (Indicative)

Vegetation

-  Forest
-  Forest (Rehabilitated)
-  Rainforest
-  Required APZ
-  Cadastre

BALs

-  BAL - FZ
-  BAL - 40
-  BAL - 29
-  BAL - 19
-  BAL - 12.5

N

AREA
SUBJECT TO
SEPARATE DA

0 200
meters

Notes:
1. Boundaries are not survey accurate
2. Do not build off the plan

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Title: Figure 5 - Required APZ and BALs

Date: 21.6.17

Location: Warners Bay

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7.0 Other Considerations

The following analysis applied to the site in reference to environmental features present.

- **Riparian Corridors** – none present.
- **SEPP 14 Coastal Wetlands** – none present.
- **SEPP 26 Littoral Rainforests** – none present.
- **SEPP 44 Koala Habitat** – the site was not determined to constitute Potential Koala Habitat under SEPP 44. As such, no further provisions of SEPP 44 apply to the proposed development.
- **Areas of geological interest** – none present.
- **Environmental protection zones or steep lands (>18°)** – none present.
- **Land slip or flood prone areas** – none known to be present.
- **National Parks estate or various other reserves** – the site is fringed by Tomaree National Park to the north, east, and south-east.
- **Threatened species matters** – none present.
- **Aboriginal Heritage** – none known to be present.



8.0 Conclusion

Investigations undertaken for this Bushfire Threat Assessment report have revealed that the proposed development will be affected by bushland hazard adjoining the site.

The proposed subdivision will be designed to wholly clear the land to be rezoned R2 – Low Density Residential outside of the identified VRZ. Tree retention within the proposed rezoning should be encouraged where possible. APZs have been fully incorporated into the subdivision design and are wholly located within land zoned R2.

Suitable access / egress would be provided via Rayford Street and Daydawn Avenue via Fairfax Road, and the proposed road network within the site is considered to be compliant with Section 4.6 of the PBP (2006).

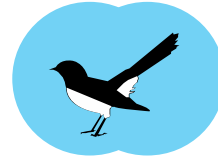
It is expected that the development will be serviced by a reticulated water supply system extended from existing and proposed residential areas, while the reticulated water supply and street hydrant access will need to be delivered in accordance with AS 2419.1–2005.

It is considered that the proposed protection measures, principally APZ's and relevant construction standards, comply with the relevant requirements of Planning for Bushfire Protection and AS-3959. When applied, these measures should provide adequate protection to life and property within the proposed development in the event of a bushfire occurring in the immediate locality. However, it can never be guaranteed that the site and residents and property therein will not at some stage be affected by a bushfire event.



9.0 References

- Australian Building Codes Board. *International Fire Engineering Guidelines*. Edition 2005.
- Environmental Planning & Assessment Act 1979*. NSW Government.
- Keith D (2004). *Ocean Shores to Desert Dunes: the Native Vegetation of NSW and the ACT*. NSW Department of Environment and Conversation, Hurstville, NSW.
- Lake Macquarie City Council (2011). *Bushfire Prone Land Map*. Lake Macquarie City Council, Speers Point, NSW.
- Lake Macquarie City Council (2014). *Development Control Plan Part 12 – Precinct Area Plans -East Munibung Hill*. Lake Macquarie City Council, Speers Point, NSW. <https://www.lakemac.com.au/development/city-planning/development-control-plans>.
- NSW Rural Fire Service (2017). *Planning for Bushfire Protection: A guide for councils, planners, fire authorities and developers*. Draft for public consultation. April 2017.
- NSW Rural Fire Service (2006). *Planning for Bushfire Protection*. NSW RFS / DoP, December 2006.
- OEH (2017). *Threatened Species, Populations and Ecological Communities* website. (<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/>).
- Rural Fires Act 1997*. NSW Government.
- Rural Fires Act Regulation 2008*. NSW Government.
- Standards Australia (2009) AS-3959 *Construction of Buildings in Bushfire-Prone Areas*.



Appendix A – Site Photographs



Plate 1. Study area with subject site in foreground, looking west along the north boundary and showing highly disturbed and managed pasture lands with scattered canopy trees, absence of native understorey vegetation, and Munibung Hill in the background



Plate 2 –Subject site Lot 6 looking south from north boundary fence showing highly disturbed and managed pasture lands with absence of understorey vegetation, existing residence on Lot 6 in the background, and residential development along the eastern boundary on the left



Plate 3. – Lot 100 subject site looking east from Munibung Hill, showing apiaries, vegetated riparian zone within Lot 6 on left, managed grasslands and remnant native vegetation patch in the south-east corner of the subject site



Plate 4. – Area of managed vegetation south-east of the subject site that is subject to an existing subdivision DA.