



Bushfire Assessment

Planning Proposal

'Meadow Views'

**142 & 144 Calderwood Road,
Calderwood**

Illawarra Land Corp Pty Ltd

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(Ref: 20147)

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

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1 Introduction

Street or property name:	142 & 144 Calderwood Road	
Suburb, town or locality:	Calderwood	Postcode: 2527
Lot/DP no:	Lot A DP 382471 and Lot 2 DP 651377	
Local Government Area:	Shellharbour City Council	
Type of proposal:	Rezoning for future residential subdivision	

1.1 Background

Illawarra Land Corp Pty Ltd commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to inform the preparation of a Planning Proposal for the 'Meadow Views' site at 142 and 144 Calderwood Road in the Shellharbour local government area. This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation and policy.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 Location and description of subject land

The subject land is comprised of two lots located on the northern side of Calderwood Road at the corner of Calderwood Road and Cattle Road as shown on Figure 1. At approximately 91 hectares in size, the subject land is cleared grazing land and is surrounded by the same for hundreds of metres.

Marshall Mount Creek dissects the subject land from west to east placing the northern third of the subject land into the Wollongong LGA. The creek line supports sporadic vegetation on incised banks, consisting of She Oaks, Coral Trees and Lantana.

The subject land is accessed by Calderwood Road on the southern boundary and Cattle Road on the western boundary.

1.3 Description of development proposal

This Bushfire Assessment Report has been prepared to inform and support a Planning Proposal that seeks to rezone a portion of land south of Marshall Mount Creek from RU1 Primary Production to allow low density residential subdivision and medium density residential development fronting Calderwood Road. The project is referred to as 'Meadow Views' and a concept lot layout plan is included as Figure 2.



Legend

Subject Land



Date: 22/10/2020

0 250 500 1,000
Metres



Figure 1: The Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap



Legend

-  Site Plan
-  Subject Land



Date: 22/10/2020

0 50 100 200
Metres

Figure 2: The Proposal

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

2 Assessment requirements

Planning Proposal submissions involving bush fire prone land (refer to Figure 3) must have regard to Section 9.1(2) Direction 4.4 – ‘Planning for Bush Fire Protection’ of the *Environmental Planning and Assessment Act 1979* as well as the NSW Rural Fire Service document ‘Planning for Bush Fire Protection 2019’ (referred to as ‘PBP’ throughout this report).

2.1 Direction 4.4 requirements

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:

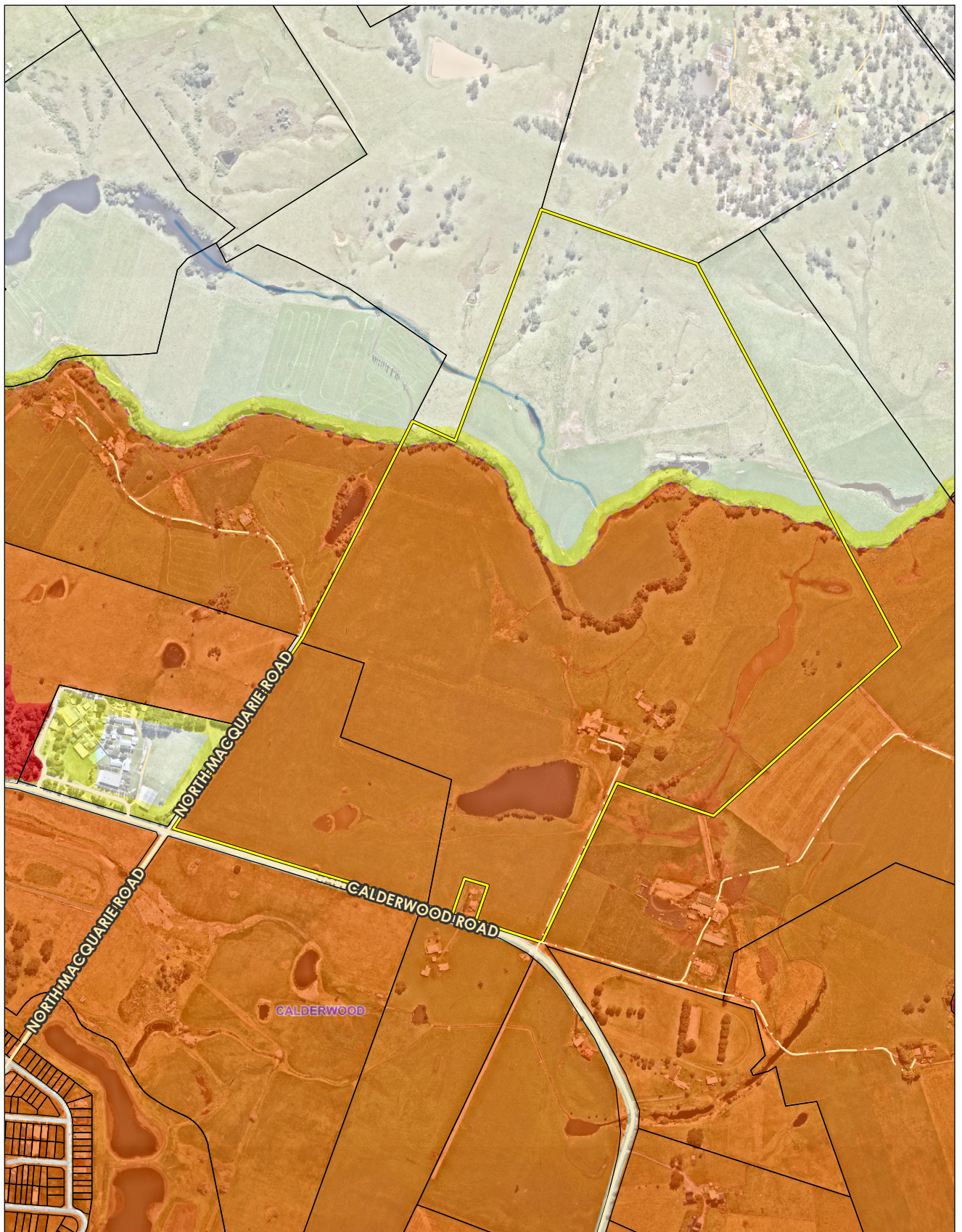
- *A draft LEP shall:*
 - *have regard to the document Planning for Bush Fire Protection;*
 - *introduce controls that avoid placing inappropriate developments in hazardous areas; and*
 - *ensure that bushfire hazard reduction is not prohibited within the asset protection zone.*
- *A draft LEP shall, 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.*







2.2 Planning for Bush Fire Protection 2019 (PBP) requirements

Most of the Direction 4.4 provisions regarding Asset Protection Zones and access are specified within PBP. This report addresses both Direction 4.4 and PBP, combining responses to requirements where there is commonality.

PBP also specifies the type of bushfire assessment and level of information and detail required for Planning Proposal submissions. PBP Section 4 'Strategic Planning' outlines the submission requirements. The Planning Proposal is to be assessed in accordance with PBP Section 4.4.1 whereby the nature, scale and risk of the proposal and its potential impact on the wider infrastructure network is such that a Strategic Bush Fire Study (SBFS) is not required in accordance with PBP Section 4.2. A SBFS is required for strategic development proposals whereby development is introduced into otherwise new areas. The proposed rezoning is essentially an extension of the Calderwood Valley development by Lendlease bordering to the west and south and is partially within a Regional Growth Area.



Legend

	Subject Land		Vegetation Category 1		Vegetation Category 3
	Bushfire Prone Land		Vegetation Category 2		
	Vegetation Buffer				



Date: 22/10/2020

0 125 250 500
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.

The subject land and bushfire hazard were inspected on 23rd September 2016.

3.1.1 *Predominant vegetation (fuels)*

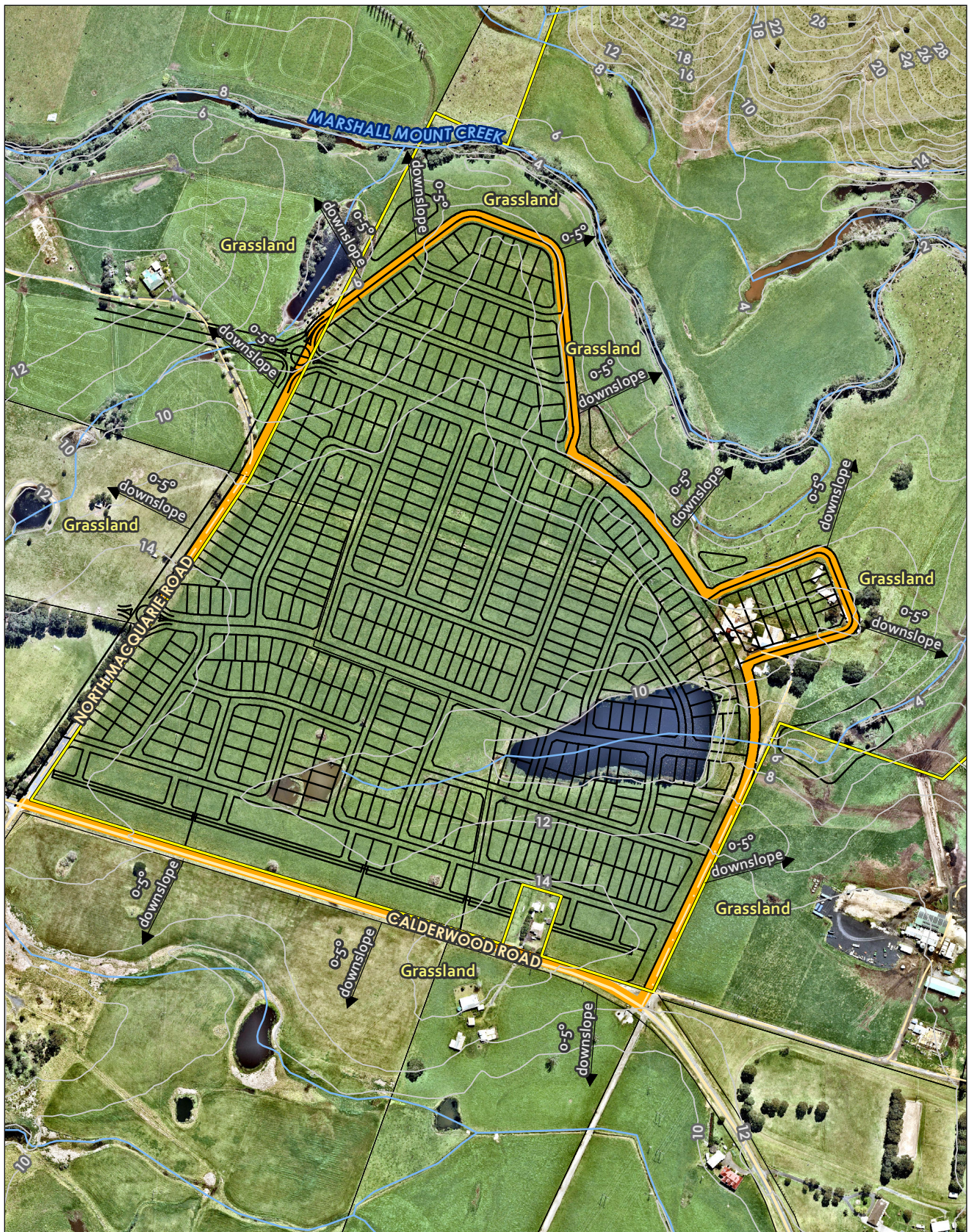
The vegetation within 140 m of the proposed rezoning area has been assessed in accordance with the methodology specified by PBP.

As mapped on Figure 4, the only bushfire hazard is 'grassland', being the adjacent grazing paddocks. The vegetation along Marshall Mount Creek is not wide enough to constitute a bushfire hazard. The land to the north of the rezoning area, including Marshall Mount Creek will be retained as grazing land, and as such, a revegetated riparian corridor is not proposed as part of future development.







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 significantly influence fire behaviour where the hazard occurs. The slope was determined using a 2 m contour layer as shown on Figure 4.

The effective slope is predominantly the gentle downslopes surrounding the subject land. The gradient is within the PBP slope class of 'downslope 0-5°'. The slope classes are indicated on Figure 4.



Legend

-  Contour - 2m
-  Watercourse
-  Site Plan
-  Subject Land
-  Cadastre
-  Asset Protection Zone - 12m



Date: 22/10/2020

0 50 100 200
Metres

Figure 4: Bushfire Attack Level

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

3.2 Bushfire threat

Beyond the subject land, the bushfire threat is assessed to be low due to the lack of bushfire hazards and the predominance of cleared and managed land uses (grazing land and residential properties). The closest bushfire hazards are remnant patches of Illawarra Lowlands Grassy Woodland over 700 m to the north and 300 m to the west. The forests associated with Johnston Spur is located over 1.5 km to the south-west.

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 subject land or adjoining areas most likely due to the low risk 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 also 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'.

4 Addressing compliance

This section details how compliance with the assessment requirements listed in Section 2 are addressed. The response to requirements is set out following the structure of Direction 4.4, followed by PBP. There is duplication 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 (Section 4.1.2). Statements of how the objectives are achieved are as follows:

4.1.1 Objectives

Objective 1

“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 PBP, legislation or related policy. To guide an assessment, reference should be made to the measures specified by *Planning for Bush Fire Protection 2019* (see Section 4.2), 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.

Objective 2

“To encourage sound management of bushfire prone areas”

The recommended bushfire protection measures demonstrate sound management of the subject land for residential use. The provisions and how they are to be addressed are listed in Section 4.1.2.

4.1.2 Provisions

Provision 1

“have regard to Planning for Bush Fire Protection”

Addressing this provision is detailed in Section 4.2. The Planning Proposal complies with PBP.

Provision 2

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

The proposed zoning is not considered inappropriate for the level of bushfire hazard in the area. Controls (bushfire protection measures) will be set in place to ensure compliance with PBP. The controls are set out in Section 4.2.

Provision 3

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

Proposed APZs will be contained wholly within the subject land or road reserves that will be routinely managed.

Provision 4

“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 will be provided to comply with the distances prescribed by PBP as detailed in Section 4.2. Perimeter access is also proposed.

Provision 5

“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”

Section 4.2 details APZs compliant with the Acceptable Solutions.

Provision 6

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

The Concept Lot Layout Plan features two-way roads and a compliant road layout. More detail on the proposed access is detailed in Section 4.2.

Provision 7

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

All aspects of future development will have a hydrant supply that complies with PBP. More details are provided at Section 4.2.

Provision 8

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

The perimeter of the rezoning area is defined by Calderwood Road to the south and Cattle Road to the west, both of which form the boundary of the future stages of the Calderwood Valley development by Lendlease. The northern and eastern perimeters of the rezoning area are influenced by the 100 year flood limit and are not excessive in regard to the adjacent grassland hazard.

Provision 9

“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 Bush Fire Protection 2019 (PBP)

Compliance with *Planning for Bush Fire Protection 2019* (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 (e.g. 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 determined. The minimum required APZ distance is 12 m and extends around the entire perimeter, with exception of the boundary opposite the Calderwood Christian School to the south-west. The APZ is accommodated within existing and proposed perimeter roads as shown on Figure 4.

4.2.2 Vegetation management and landscaping

Future subdivision and development applications will need to demonstrate that the APZs and building envelopes can be managed and landscaped to achieve the fuel management standard of an Inner Protection Area (IPA) as described within Appendix 4 of PBP. The following guide has been designed to achieve an IPA standard at this site:

Trees

- Tree canopies at maturity should not be within 2 m of a dwelling roofline.
- Tree canopies should not be connected between the hazard and a dwelling. Gaps between crowns or groups of crowns are to be maintained at distances of 2 to 5m.

Shrubs

- Shrubs are to be limited and be within managed garden beds to prevent the spread of fire towards buildings.

Groundcovers

- Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height).
- Fine fuels on the ground such as leaves and twigs should be regularly removed.
- Organic mulch is not to be used within 1 m of a dwelling.

4.2.3 Access

Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response.

Alternate access is provided at the south-eastern and south-western corners of the subject land onto Calderwood Road. Additional access is provided onto Cattle Road on the western boundary, which will be complemented by additional links through the Calderwood Valley development.

The level of alternate access and egress is considered to be adequate given the low risk nature of the threat posed by the surrounding paddocks.

Perimeter access

The Concept Layout Plan provides perimeter access roads at all interface locations complemented by the existing Calderwood Road to the south and Cattle Road to the west.

Design and construction standards

The Concept Layout Plan shows that all future roads can comply with the PBP Acceptable Solutions for public roads in bushfire prone areas as required by PBP Table 5.3b. The requirements are repeated below.

PBP design standards for roads servicing residential subdivision:

- *Property access roads are two-wheel drive, all weather roads.*
- *Perimeter roads are provided for residential subdivisions of three or more allotments.*
- *Subdivisions of three or more allotments have more than one access in an out of the development.*
- *Traffic management devices are constructed to not prohibit access by emergency service vehicles.*
- *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.*
- *All 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.*
- *Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.*
- *Where access/egress can only be achieved through forest, woodland or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.*
- *The capacity of perimeter and non-perimeter road surfaces and any bridges and causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); Bridges/causeways to clearly indicate load rating.*
- *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 AS 2419.1:2005.*
- *There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.*
- *Perimeter roads are:*
 - *two-way sealed roads;*
 - *8 m carriageway width kerb to kerb;*

- *parking is provided outside of the carriageway width;*
 - *hydrants are located clear of parking reserves;*
 - *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
 - *curves of roads have a minimum inner radius of 6 m;*
 - *the maximum road grade is 15° and average grade is 10°;*
 - *the road crossfall does not exceed 3°;*
 - *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*
- *Non-perimeter roads are:*
 - *Minimum 5.5 m width kerb to kerb;*
 - *parking is provided outside of the carriageway width;*
 - *hydrants are located clear of parking reserves;*
 - *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
 - *curves of roads have a minimum inner radius of 6 m;*
 - *the road crossfall does not exceed 3°;*
 - *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*

4.2.4 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).

5 Conclusion and recommendations

The information presented in this Bushfire Assessment Report demonstrates that the proposal to amend the zoning at the subject land for future residential development can satisfy the Ministerial Direction No. 4.4 – ‘Planning for Bush Fire Protection’ and the requirements of *Planning for Bush Fire Protection 2019*. This is achieved by providing compliant bushfire protection measures such as APZs and adequate access.

The Concept Layout Plan demonstrates the application of compliant APZs and access and will facilitate future subdivision applications.

Bushfire protection measures for the proposed rezoning recommended within this report to achieve the requirements are listed below:

- Provision of a minimum 12 m APZ to potential grassland hazards surrounding the proposed rezoning area.
- Compliant road widths and design including perimeter roads between future lots and potential grassland hazards as shown on the Concept Layout Plan.
- Adequate water supply to allow fire-fighting operations by fire authorities.



David Peterson



References

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

NSW Rural Fire Service (RFS) 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, and Developers*. State of New South Wales through the NSW Rural Fire Service, 2019.

Standards Australia 2005. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Fourth edition 2005, Standards Australia International Ltd, Sydney.

