



Bushfire Assessment

Planning Proposal

**Lot 442 Henry Parkes Drive,
Kiama Downs**

Indesco

31 January 2020

(Ref: 20005)

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Executive summary

Objective

This Bushfire Assessment Report was commissioned by Indesco to inform a Planning Proposal application seeking approval to rezone Lot 442 DP 1201831 Henry Parkes Drive, Kiama Downs 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 Bush Fire Protection 2006*.

Bushfire hazard and risk

The hazard consists of a narrow, low hazard corridor of roadside vegetation between the subject land and the Princes Highway to the west. Pasture and She Oaks along the edge of Terragong Swamp to the north of the subject land do not present a threat to the subject land.

Beyond the subject land, the bushfire threat is assessed to be low due to the lack of existing hazards. The Illawarra Bush Fire Risk Management Plan (Illawarra Bush Fire Risk Management Committee 2017) reports a low bushfire risk for Kiama Downs and the absence of landscape-wide fire within the surrounding area since recorded history. A risk rating of future residential development at the subject land would also be low and will also benefit from 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 a minimum 11 m wide APZ along the western boundary of the subdivision to the low hazard corridor of vegetation located between the Princes Highway and shared pathway.
- A subdivision perimeter road along the western boundary between future lots and the low hazard corridor of vegetation.
- Compliant road widths and design.
- 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

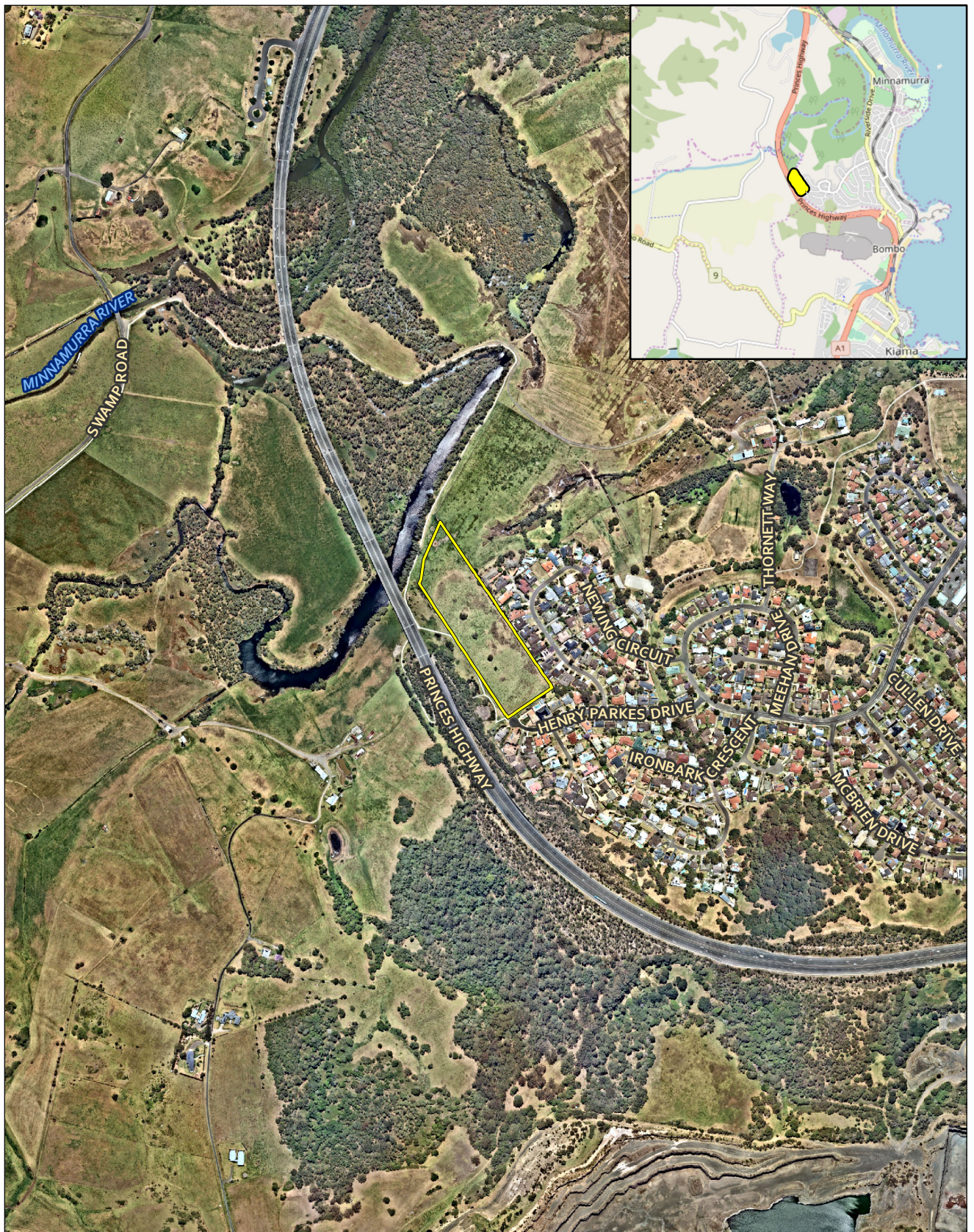
Indesco commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to accompany a Planning Proposal to rezone land in Kiama Downs to allow future subdivision for residential development. This report addresses the requirements for assessment of rezoning proposals involving bushfire prone land, 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 442 DP 1201831) is located at the western edge of Kiama Downs as shown on Figure 1. At just over 3 hectares in size, the subject land is bound by the existing residential area of Kiama Downs to the east and south, as well as the Princes Highway to the west and the Terragong Swamp and the Minnamurra River system to the north.

1.3 The proposal

The proposal seeks to rezone the subject land to allow residential subdivision. A concept subdivision layout is included as Figure 2. Future development will include subdivision into residential lots, the construction of a loop road to service the lots, and associated infrastructure.



Legend

Subject Land



Date: 31/01/2020

0 50 100 200

Metres


Figure 1: The Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap



Legend

 Subject Land



Date: 31/01/2020

0 20 40 80
Metres

Figure 2: The Proposal

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

2 Assessment requirements

The subject land is identified as 'bushfire prone land' 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 Bush Fire 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 Bush Fire 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 |  | Bush Fire Prone Land |  | Vegetation Category 3 |
| | |  | Vegetation Category 1 |  | Vegetation Buffer |
| | |  | Vegetation Category 2 | | |



Date: 31/01/2020

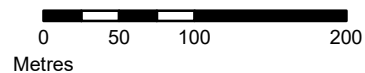


Figure 3: Bushfire Prone Land

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.

Site assessment occurred on 29th January 2020. Photographs are provided in Appendix 1.

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. There are two bushfire hazards within the assessment area as mapped on Figure 4 and described below:

Low hazard to the west

A narrow corridor of roadside vegetation extends along either side of the Princes Highway to the west of the subject land. Both corridors are less than 50 m wide and are therefore classified as 'low hazard vegetation' in accordance with PBP. The vegetation is separated from the subject land by a shared pathway.

Forested Wetland to the north

Terragong Swamp to the north supports 'forested wetland' on the northern side of the estuary channel. The southern side of the channel is lined with She Oaks that do not form a size large or wide enough to be classified as a bushfire hazard.

The pasture to the north of the subject land is not considered to be a grassland hazard due to lack of native grass species and growth height managed by grazing.

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 slopes upon which the hazard is situated is within the PBP slope class of 'upslope/flat' for the low hazard to the west and forested wetland to the north. The slope classes are indicated on Figure 4.

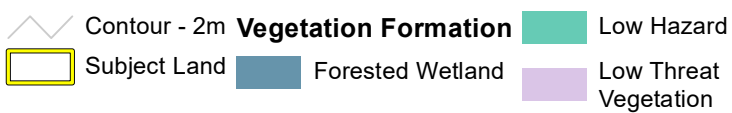
3.2 Bushfire threat and risk

Beyond the subject land, the bushfire threat is assessed to be low due to the hazard being separated from the subject land and the lack of forest within proximity. The surrounding land is either developed, cleared pasture or estuarine environment.

Assessing the impact of bushfire is often better addressed by measuring risk. Bushfire risk is defined (Illawarra Bush Fire 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 Bush Fire Risk Management Plan (Illawarra Bush Fire Risk Management Committee 2017) states that the existing Kiama Downs residential community (Asset No. 205) is at 'low' bushfire risk and 'not applicable' priority. The risk ranking, which includes the subject land, is due to the current lack of bushfire hazards, as well as the absence of landscape-wide fire within the surrounding area since recorded history. A risk rating of future residential development at the subject land would also be low. A new residential subdivision will also have compliant bushfire protection measures in accordance with PBP. Required measures to achieve compliance are discussed in the following Section 4 – 'Addressing Compliance'.



Legend



Date: 31/01/2020

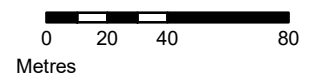


Figure 4: Bushfire Hazard Analysis

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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 Bush Fire 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 Bush Fire 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 under a management regime. APZs will be placed within lots, road reserves, and designated open space so that they can be maintained without conflicting with any environmental objectives.

“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 compliant 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”

The hazard interface is uniform and consists of low hazard only. The perimeter is not excessive and does not create ‘pinch-points’ or ‘bottle-necks’ amongst the hazard.

“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 2006 (PBP)

Compliance with *Planning for Bush Fire 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 determined (see Table 1 below). The APZ dimensions are based on the document ‘Planning for Bush Fire Protection 2019’ (PBP 2019) as subdivision of the subject land would occur after March 2020 when the document is due to become legislated. The APZ distances specified within PBP 2019 meet or exceed those specified within PBP 2006, therefore achieving compliance with Direction 4.4.

Only one APZ is required, being 11 m minimum along the western interface of the subject land adjacent the low hazard corridor. The separation between the dwellings and the hazard will exceed this distance, comprised of the shared pathway, proposed subdivision perimeter road and building setbacks within proposed lots.

Table 1: APZ determination

Location ¹	Vegetation ²	Slope ³	APZ ⁴	APZ placement ⁵
Northern boundary	Pasture: non-hazard	Not required	Not required	Not required
Eastern boundary	Existing lots: non-hazard	Not required	Not required	Not required
Southern boundary	Existing lots: non-hazard	Not required	Not required	Not required
Western boundary	Low hazard	Upslope/ Flat	11 m	Shared pathway, perimeter road and dwelling setbacks

¹ Direction of assessment from proposed development.

² Predominant vegetation classification over 140 m from proposed development.

³ Effective slope assessed over 100 m from proposed development where the bushfire hazard occurs.

⁴ Minimum APZ required by ‘Planning for Bush Fire Protection 2019’ Table A1.12.2.

⁵ Land use that will accommodate the APZ.

4.2.2 Access

Alternate access and egress

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

The concept subdivision layout shows a logical pattern of access featuring a loop road connected to Henry Parkes Drive. The loop road provides an alternate route to the Henry Parkes Drive connection. Although there is only one connection to the existing road system, it is considered acceptable as the hazard only consists of roadside vegetation forming a narrow low hazard corridor.

Perimeter access

A continuous perimeter road along the length of the low hazard corridor is not essential due to the low threat presented. Notwithstanding, a perimeter road has been included in the design along the western interface.

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 compliant bushfire management, the proposal can coexist within the surrounding lands which are assessed to present a low bushfire risk.

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

- Provision of a minimum 11 m wide APZ along the western boundary of the subdivision to the low hazard corridor of vegetation located between the Princes Highway and shared pathway.
- A subdivision perimeter road along the western boundary between future lots and the low hazard corridor of vegetation.
- Compliant road widths and design.
- Adequate water supply to allow fire-fighting operations by fire authorities.



David Peterson



References

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 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 November 2019.

Illawarra Bush Fire Management Committee (WWBFMC) 2017. *Bush Fire Risk Management Plan*. Prepared by the IBFMC pursuant to section 52 of the Rural Fires Act 1997.

Appendix 1 - Photographs



Photograph 1: Southern entry to subject land from Henry Parkes Drive (looking north)



Photograph 2: Low hazard corridor to the west beyond the shared pathway (looking north)



Photograph 3: Low hazard corridor to the west (looking north)



Photograph 4: Grass between shared pathway and subject land at northern end (looking east)



Photograph 5: Pasture at northern end of subject land (looking south-east)



Photograph 6: Line of She Oaks along southern bank of estuary (looking east)



Photograph 7: Line of She Oaks along southern bank of estuary (looking east)



Photograph 8: Forested wetland on northern side of estuary (looking north)

