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Bushfire Assessment

Residential Subdivision

10 Col Drewe Drive,
Bowenfels

J. Wyndham Prince Pty Ltd

29 November 2022

(Ref: 22108)

report by
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FPA AUSTRALIA (NO.BPAD18882)
BPAD LEVEL 3 ACCREDITED PRACTITIONER
ABN 28 607 444 833

Contents

1 Introduction

Street or property name:	10 Col Drew Drive		
Suburb, town or locality:	Bowenfels	**Postcode:**	2790
Lot/DP no:	Lot 1 DP 1268778		
Local Government Area:	Lithgow City Council		
Type of development:	Residential subdivision		

1.1 Background

J. Wyndham Prince Pty Ltd commissioned Peterson Bushfire to prepare a Bushfire Assessment Report for a proposed residential subdivision located on bushfire prone land in Bowenfels, south-west of Lithgow. 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 of subject land and description of proposal

The subject land is located approximately 3.5 km south-west of Lithgow adjacent the Lithgow Hospital as shown on Figure 1. Consisting of a single lot with an area of just over 6 hectares in size, subject land is a cleared and vacant. The lower portion of the subject land that adjoins the northern and western boundaries of the Lithgow Hospital site is zoned R2 Low Density Residential and is the subject of the subdivision proposal. The higher portion in the western part of the subject land is zoned C3 Environmental Management.

The bushfire hazards consist of undeveloped paddocks adjoining the R2 zoned land located to the east, north and west. A description of the bushfire hazard is provided in Section 2.

The proposal consists of the subdivision of the subject land into residential allotments, including superlots subject to integrated housing, and the creation of public roads. The plan of subdivision is included as Figure 2.

1.3 Assessment requirements

The subject land is identified as 'bushfire prone land' on the Lithgow Bushfire Prone Land Map (refer to Figure 3). Section 4.46 *Environmental Planning and Assessment Act 1979* requires a bushfire assessment of residential subdivision proposals on bushfire prone land following the process and methodology set out within Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2022* and the NSW Rural Fire Service (RFS) document *Planning for Bush Fire Protection 2019* (referred to as 'PBP' throughout this report).

Legend

- Watercourse
- Subject Land

N

DKGIS

Date: 23/11/2022

0 125 250 500

Metres

Figure 1: Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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Legend

- Watercourse
- Subject Land
- Cadastre

N

DKGIS

Date: 15/11/2022

0 20 40 80

Metres

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

Figure 2: The Proposal

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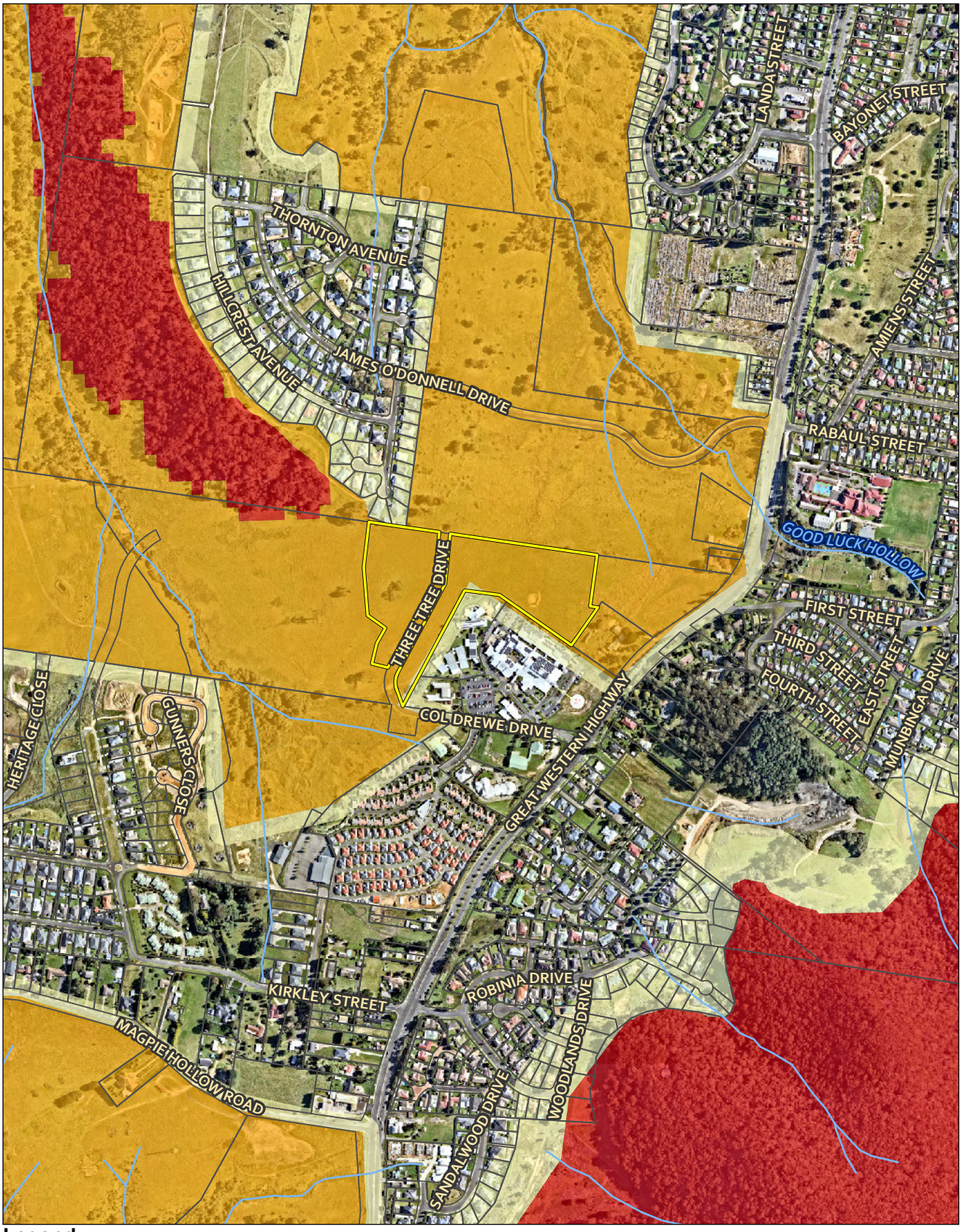

Legend

Watercourse
Subject Land
Cadastre

Bushfire Prone Land

Vegetation Category 1
Vegetation Category 3
Vegetation Buffer

N

DKGIS

Date: 15/11/2022

0 50 100 200
Metres

Figure 3: Bushfire Prone Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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2 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone (APZ) location and dimension. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

2.1 Predominant vegetation

The vegetation within 140 m of the subject land has been assessed in accordance with the methodology specified within PBP. Figure 4 maps the current distribution of the identified hazards.

The bushfire hazard consists of potential grassland hazard within cleared and vacant paddocks adjoining to the east and north, and within the C3 zoned land to the west. The grass within these lands could act as a potential grassfire hazard depending on growth and curing rates as well as grazing regimes.

The adjoining property to the north is subject to an approved subdivision therefore the grassland hazard in that direction is temporary only. Similarly, the adjoining property to the east is likely to be developed in the near future.

2.2 Effective slope

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 slope underneath the identified grassland hazards is within the PBP slope class of ‘downslope 0-5 degrees’ to the east and north, ‘upslope’ within the C3 zoned land to the west, and ‘downslope 5-10 degrees’ to the south-west.

Legend

- Contour - 2m
- Watercourse
- Subject Land
- Cadastre
- Vegetation Assessment Area

Vegetation Formation

- Grassland

Asset Protection Zone

- Asset Protection Zone - 10m
- Asset Protection Zone - 12m
- Asset Protection Zone - 13m

N

DKGIS

Date: 16/11/2022

0 25 50 100

Metres

Figure 4: Bushfire Hazard Analysis and Asset Protection Zone (APZ)

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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3 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for residential subdivision. The measures required to be assessed are listed in Table 1 below and are discussed in detail in the remainder of this section.

Table 1: PBP bushfire protection measures

Measures	Considerations
Asset Protection Zones (APZ)	Location and dimension of APZ building setbacks from vegetation including prescriptions of vegetation management within the APZ.
Access	Assessment to include access and egress, perimeter access and design standards of public roads.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for fire-fighting.

3.1 Asset Protection Zones (APZ)

Using the vegetation and slope information presented in Section 2 and mapped on Figure 4, an Asset Protection Zone (APZ) suitable for residential subdivision has been calculated. The APZ determination is listed in Table 2 below and the APZ is mapped on Figure 4.

Table 2: APZ determination

Location[1]	Vegetation[2]	Slope[3]	APZ[4]	How will the APZ be accommodated
East	Grassland	Downslope 0-5˚	12 m	Within adjoining property (Lot 2 DP 1082148) by a temporary s88B easement until hazard is removed by adjoining development
North	Grassland	Downslope 0-5˚	12 m	Within adjoining property (Lot 2 DP 10499398) by a temporary s88B easement until hazard is removed by adjoining development
West	Grassland	Upslope	10 m	Within subject land by a temporary s88B easement until hazard is removed by the next stage of development
South-west	Grassland	Downslope 5-10˚	12 m	Within subject land by a temporary s88B easement until hazard is removed by the next stage of development

[1] Direction of assessment from subject land. Refer to Figure 4.

[2] Predominant vegetation classification over 140 m from subject land.

[3] Effective slope assessed where the bushfire hazard occurs.

[4] APZ required by Table A1.12.2 of Planning for Bush Fire Protection 2019.

The APZs to the north and east will be temporarily placed within the adjoining properties by way of a s88B easement until the hazards are removed during the process of development of the adjoining land.

The APZs to the west and south-west are contained within the subject land and are also temporary measures to be placed within a s88B easement until development progresses generally in the west direction removing the need for the APZs

3.2 Vegetation management

Earthworks and construction of the proposal will ensure the subdivision complies with the standard of an Inner Protection Area (IPA) as described by Section A4.1.1 of PBP.

Maintenance of the APZs and landscaping proposed across the subdivision, such as street trees, are to achieve the principles listed in Section A4.1.1 of PBP.

The IPA requirements stated within PBP are repeated below:

> ***A4.1.1 Inner Protection Areas (IPAs)***
>
> *The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.*
>
> *In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.*
>
> *When establishing and maintaining an IPA the following requirements apply:*

- ***Trees***
  - *tree canopy cover should be less than 15% at maturity;*
  - *trees at maturity should not touch or overhang the building;*
  - *lower limbs should be removed up to a height of 2m above the ground;*
  - *tree canopies should be separated by 2 to 5m; and*
  - *preference should be given to smooth barked and evergreen trees.*
- ***Shrubs***
  - *create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;*
  - *shrubs should not be located under trees;*
  - *shrubs should not form more than 10% ground cover; and*
  - *clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.*

- ***Grass***
  - *grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and*
  - *leaves and vegetation debris should be removed.*

3.3 Access

3.3.1 Alternate access and egress

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

The access to the subdivision will initially be from a single access point from Col Drewe Drive to the south. A second access point road will be provided through the approved subdivision to the north will which ensure alternate access. Any temporary period of a single access point to the south, should development of the subject land be completed prior to the land to the north, is acceptable in this instance due to the low risk nature of the bushfire threat consisting of cleared paddocks only. It is highly unlikely for Col Drewe Drive to be severed by the impacts of bushfire impact.

3.3.2 Perimeter access

Perimeter access roads are not required for temporary and low risk grassland hazards.

3.3.3 Design and construction standards

The road design is to comply with the PBP Acceptable Solutions (Table 5.3b of PBP) for the design and construction of non-perimeter roads in bushfire prone areas as listed below.

The extension of Col Drewe Drive will be 11 m wide kerb-to-kerb and will therefore comply with the 5.5 m carriageway width requirement of a non-perimeter road, allowing parking either side. The remainder of the roads will be 8 m wide kerb-to-kerb and will temporarily have 'No Parking' restrictions on one side of the road to ensure a 5.5 m wide carriageway until such time that the adjoining properties to the north and east have had the grassland hazards removed as part of an approved development. Removal of the adjoining grassland hazards will ensure that the lots accessed by the remaining roads are not within bushfire prone land, therefore removing the requirement for the provision of parking outside of the 5.5 m carriageway width.

<u>PBP design standards for roads servicing residential subdivision:</u>

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

3.4 Water supply and utilities

3.4.1 Water supply

Fire hydrants are to be installed along road reserves 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).

3.4.2 Electricity supply

Electricity will be provided below ground, therefore complying with PBP.

3.4.3 Gas supply

Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.

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4 Conclusion and recommendations

4.1 Summary

The proposal consists of a residential subdivision south-west of Lithgow adjoining the Lithgow Hospital site. The bushfire hazard consists of cleared paddocks adjoining to the east, north and west. It is proposed to temporarily place APZs within adjoining properties to the east and north within s88B easements to ensure maintenance of an APZ until development of the adjoining lands occur. Similarly, the APZs to the west that fall within the subject land will be placed within a s88B easement until the adjoining grassland is removed as part of the next stage of development.

The single road access point to the south will be complemented by a second access to the north with the development of the adjoining land. The proposed roads are to comply with the PBP Acceptable Solutions until the removal of the grassland hazards on the adjoining lands to the north and east which will see the lots and roads removed from bushfire prone land and the ability to allow parking within the carriageway width.

4.2 Conclusion

This report presents an assessment of a residential subdivision at 10 Col Drewe Drive, Bowenfels. The assessment demonstrates that the proposal, together with the recommendations (see below), complies with *Planning for Bush Fire Protection 2019*.

4.3 Recommendations

The recommendations made within this assessment are repeated below:

1. A 12 m APZ is to be maintained within the adjoining lot to the east (Lot 1 DP 1082148) and north (Lot 2 DP 1082148) as shown on Figure 4 by way of a s88B easement until the hazards are removed during the process of development of the adjoining lands.
2. A 10 m and 13 m APZ is to be maintained within the subject land to the west of the proposed lots as shown on Figure 4 by way of a s88B easement until the hazards are removed during the process of development of the adjoining lands.
3. APZs are to be maintained to achieve the standard of an Inner Protection Area (IPA) as listed in Section A4.1.1 of *Planning for Bush Fire Protection 2019*.
4. Landscaping across the subdivision is to achieve the standard of an Inner Protection Area (IPA) as listed in Section A4.1.1 of *Planning for Bush Fire Protection 2019*.
5. The proposed roads are to comply with the PBP Acceptable Solutions (Table 5.3b of PBP) for the design and construction of non-perimeter roads. With the exception of the extension of Col Drewe Drive, the roads are to temporarily have ‘No Parking’ restrictions on one side until such time that the adjoining properties to the north and east have had the grassland hazards removed as part of an approved development.

6. Fire hydrants are to be installed along road reserves to achieve compliance with AS 2419.1 – *2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).

7. Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.

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References

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.

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

Standards Australia. 2014. *The storage and handling of LP Gas*, AS/NZS 1596-2014, Fifth edition, Standards Australia International Ltd, Sydney.

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