Premise

Bushfire Risk Assessment

STAGE 12C CAERLEON ESTATE

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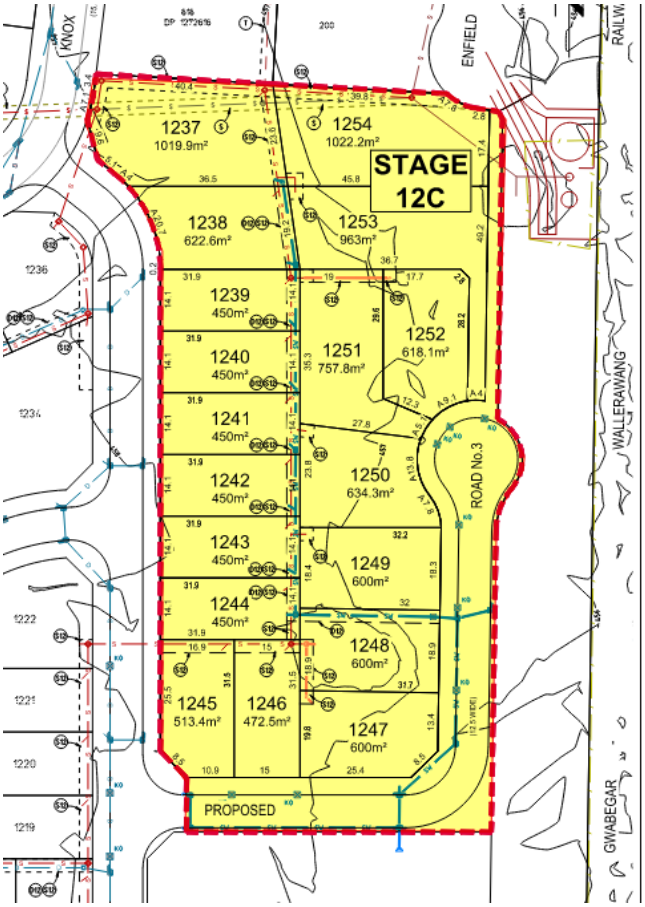
1. INTRODUCTION

Premise has been commissioned by Caerleon Mudgee Pty Ltd to prepare a Bushfire Risk Assessment to accompany a Development Application (DA) for a proposed subdivision in relation to land at 26 Hone Creek Drive, Caerleon. The development is described as Stage 12 of the Caerleon development and will be undertaken over three stages. This application is for Stage 12C as shown in **Figure 1** below.

Figure 1 – Stage 12C



In accordance with Clause 4.46(1) of the *Environmental Planning and Assessment Act 1979*, the proposed development requires authorisation under Section 100B of the *Rural Fires Act 1997* by way of a Bush Fire Safety Authority (BFSA). In accordance with Section 100B of the *Rural Fires Act 1997*, a BFSA is required to be obtained prior to developing bush fire prone land for the purpose of residential or rural residential subdivision. The proposal is for the subdivision of bushfire prone land for residential purposes. Section 100B (4) of the *Rural Fires Act 1997* requires an application for such an authority to be made to the Commissioner of the NSW Fire Service in accordance with Clause 44 of the *Rural Fires Regulation 2013*. The NSW Rural Fire Service is the agency authorised to issue a BFSA.

This report has been prepared in accordance with the requirements of Planning for Bush Fire Protection 2019 and the application is made pursuant to Clause 44 of the Rural Fires Regulation 2013 and the NSW Rural Fire Services' "Submission Requirements". This report is set out in the following format:

- **Section 2** provides a description of the site subject to the DA.
- **Section 3** provides a description of significant environmental features at the site.

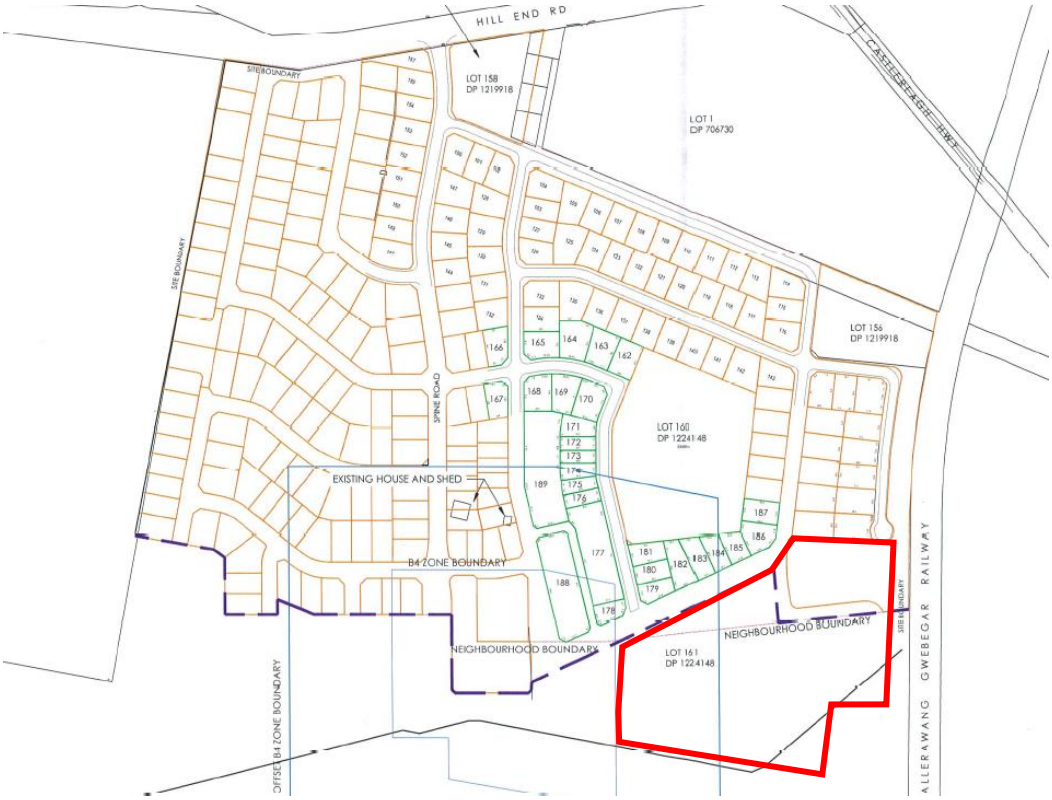
- **Section 4** provides a Bushfire Risk Assessment for the proposed development.
- **Section 5** concludes the report.

2. BACKGROUND

2.1 The Site

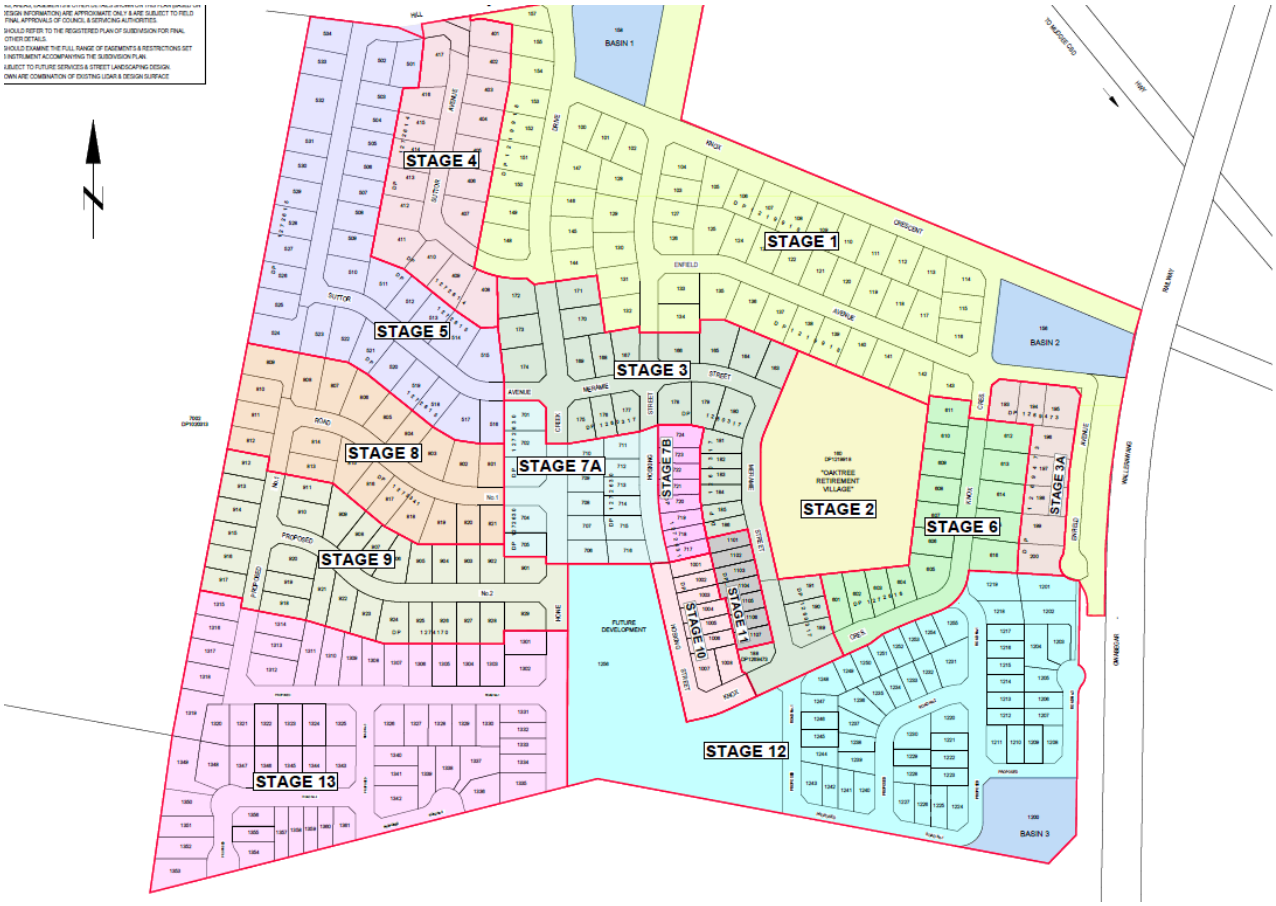
The site on which this application is made is Lot 201 DP 1269473 known as 26 Hone Creek Drive, Caerleon. The subject site is a residue lot created as part of a previous application. It is located south of Hill End Road and the existing residential lots/ dwellings constructed as part of earlier stages of the Caerleon development. A plan of the approved subdivision is provided in **Figure 2** below which is located directly north of the subject site (residential lots outlined in red).

Figure 2 – The Subject Site



The subject site is an irregular shaped parcel and will have access from adjoining access roads to the north. Registration of Stage 12 will follow the registration of Stages 1-11 of Caerleon Estate which is illustrated in **Figure 3** below.

Figure 3 – Staging Plan



3. THE DEVELOPMENT

3.1 Proposed Development and Zoning

The proposed development comprises a subdivision creating 18 residential lots known as Stages 12C. The proposed subdivision involves construction of a cul-de-sac, earthworks, servicing and stormwater works.

All lots within Stage 12C are not located on bushfire prone land, however it is noted the subject site is located on a residue lot is partly identified as bushfire prone land. It is noted the bushfire threat is located approximately 500 metres from the bushfire mapped land.

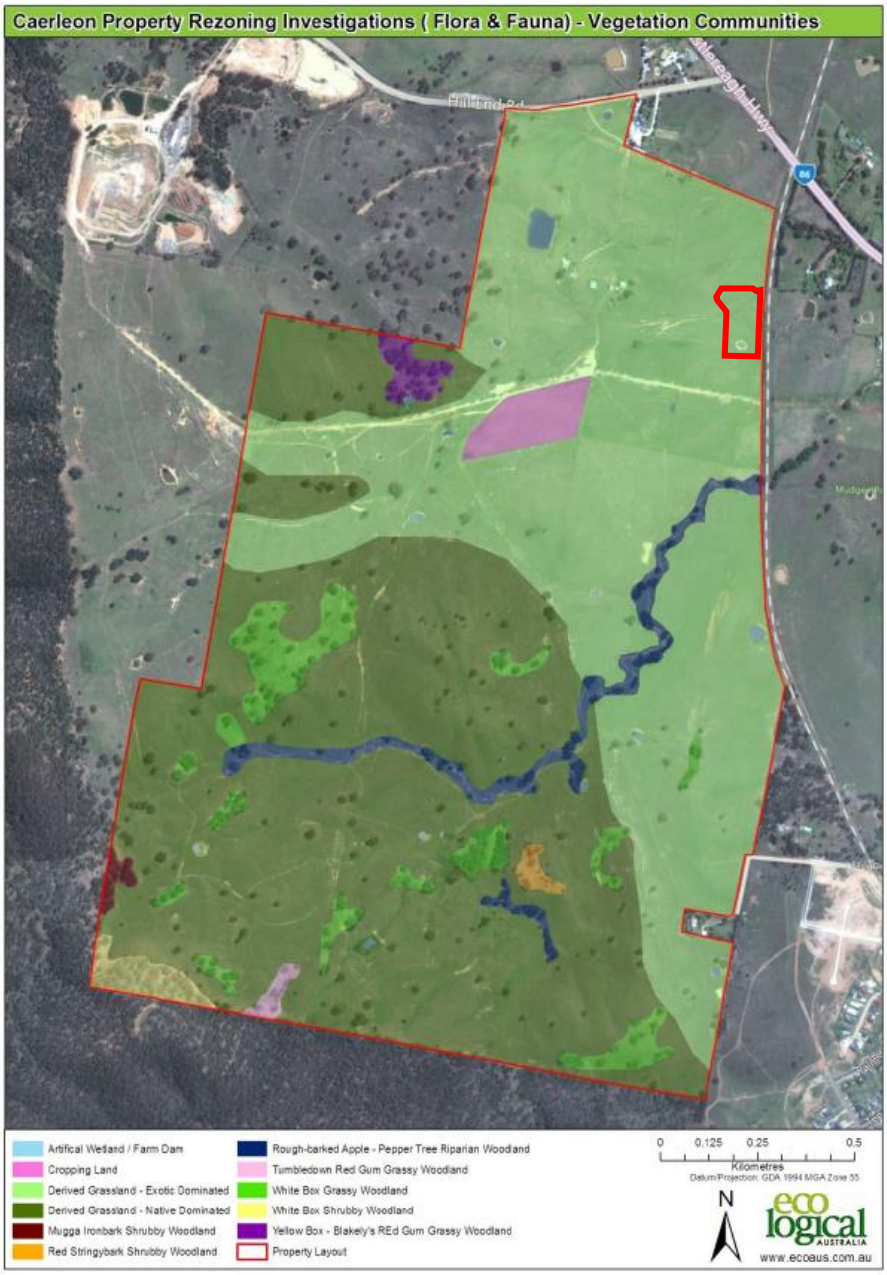
3.2 Vegetation

Vegetation in and directly surrounding the subject site is identified as grassland. Further to the west, the vegetation identified in this area is woodland.

Intact bushfire prone vegetation on the western and southwestern portion of Lot 201 currently consists of small patches of woodland and large areas of grassland. According to the vegetation formations for the purposes of determining hazard levels of vegetation communities, the main hazard affecting the site was considered as "Grassland" whilst the smaller areas of woodland were assessed as "Woodland (Grassy)"

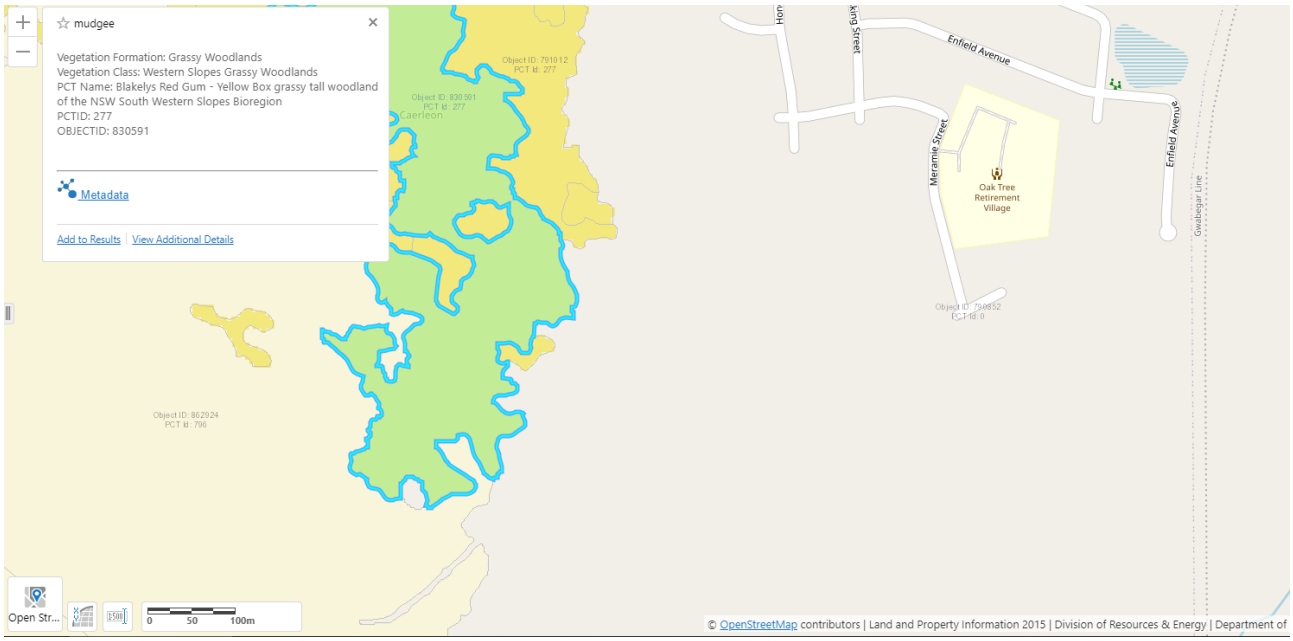
By reference to the ecological assessment prepared for the rezoning of the site, vegetation formations within Caerleon Estate development are mapped as per **Figure 4** – Vegetation Communities below.

Figure 4 – Vegetation Communities



Vegetation formations on the adjoining property to the west are identified as Western Slopes Grassy Woodlands as shown in the map in **Figure 5**.

Figure 5 – Vegetation Formations on Adjoining Property



3.3 Slope

Slopes across the subject site are minor and directly adjoin land being generally flat. The subject site is located upslope from the vegetation. The subject site is located at 458 metres AHD with the bushfire threat located at 482 metres AHD. The distance from the vegetation is 694 metres, resulting in an average slope of 3.45 percent. **Figure 6** depicts the slope at the site.

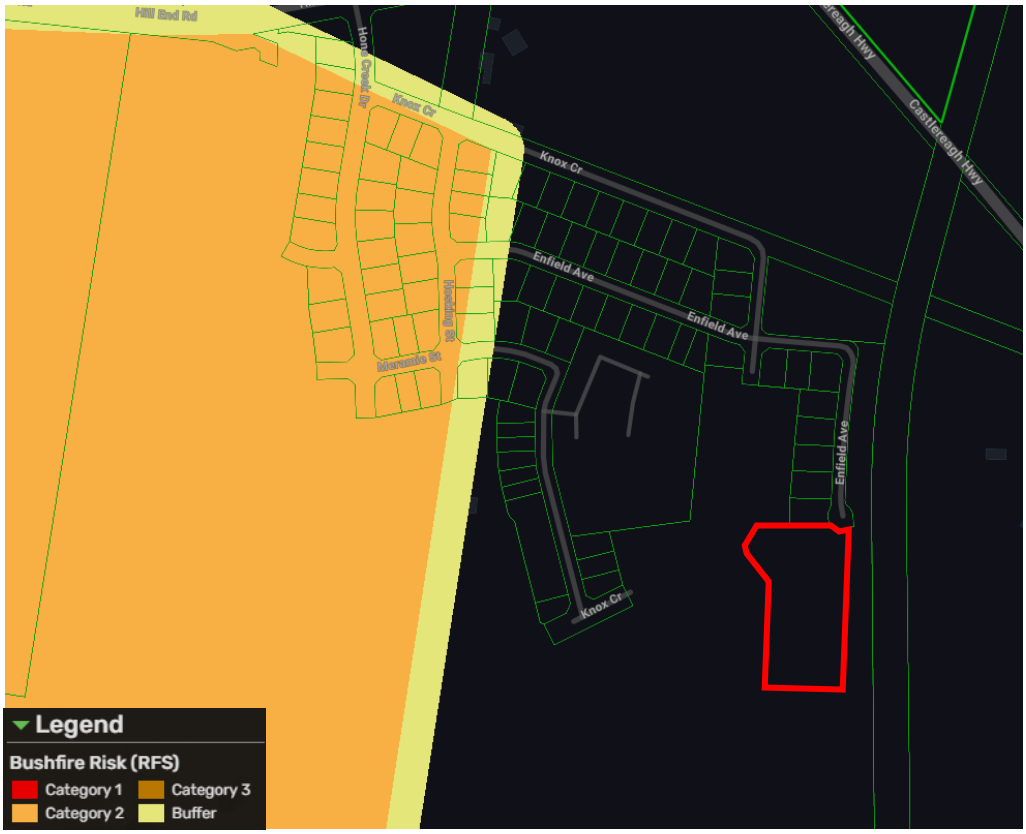
Figure 6 – Slope at the Subject Site

3.4 Bushfire Prone Land

There is no land within proximity which is identified as Category 1 bushfire prone land. The subject site and surrounds are predominantly located in areas of grassland which has been approved for residential

development. The vegetation on the adjoining property to the west consists of scattered trees and does not provide a connecting canopy. The subject site will be separated from the bushfire threat by residential lots/ dwellings which form part of future Stages 12A, 12B and Stage 13, as shown on the Staging Plan in **Figure 3**. The western extent of the subject site is mapped as 'buffer' with the land further west identified as Category 2 - refer to Error! Reference source not found.**7**. It is noted the subject site is located within an area with a Forest Fire Danger Index (FFDI) of 80.

Figure 6 – Bushfire Prone Land Map



The land to the east of the subject site is zoned RE1 Public Recreation and will be maintained by Council which will comprise street tree planting, footpaths and the existing drainage channel.

4. SIGNIFICANT ENVIRONMENTAL FEATURES

4.1 Ecology

The site does not contain any significant vegetation worthy or required for retention. As identified in **Figure 4**, the subject site surrounding land contains derived exotic grassland. The surrounding land has been approved for residential subdivision which will result in the removal of the unmanaged exotic grassland and construction of new roads and residential lots with future dwelling construction and managed landscaped surrounds. The proposal does not include removal of any trees within or surrounding the site.

4.2 Indigenous Heritage

A search of the subject site (including a 200 m buffer) of the Aboriginal Heritage Information Management System (AHIMS) did not identify any recorded Aboriginal sites or places.

No Aboriginal places were identified on or near the site in the Office of Environment and Heritage's NSW Atlas of Aboriginal Places. No Aboriginal places or objects were identified on or near the site in the State Heritage Register (SHR).

There is an item located approximately 750 metres to the northwest of the subject site, however the proposal will not result in any impact on this item.

4.3 Extractive Resources

A review of the MinView DIGS database confirms no current exploration or mining leases (or applications) cover the subject site.

4.4 Contamination

A review of available database information, including the EPA contaminated land record and the List of NSW Contaminated Sites Notified to EPA as of 15 March 2021 (both accessed on 15/03/21) confirms the site is not known or likely to contain instances of contamination would require remediation.

The land use at the site remains consistent with the current arrangement and no change to receptor pathways for contamination would be expected as a result of the application.

5. BUSHFIRE RISK ASSESSMENT

5.1 Introduction

There are currently no dwellings on the site. The proposed subdivision would allow for up to 18 dwellings to be developed.

5.2 Asset Protection Zones

5.2.1 DEFINITIONS

An Asset Protection Zone (APZ) is:

An APZ is a buffer zone between a bush fire hazard and buildings. The APZ is managed to minimise fuel loads and reduce potential radiant heat levels, flame, localised smoke and ember attack. The appropriate APZ distance is based on vegetation type, slope and the nature of the development (NSW RFS 2019).

APZs consist of:

- Inner Protection Area (IPA): The component of an APZ which is closest to the asset (measured from unmanaged vegetation). It consists of an area maintained to minimal fuel loads so a fire path is not created between the hazard and the building.
- Outer Protection Area (OPA): located between the IPA and the unmanaged vegetation The outer component of an APZ, where fuel loads are maintained at a level where the intensity of an approaching bush fire would be significantly reduced.

- A defendable space: an area within the Inner Protection Area (IPA) of an APZ adjoining a building. This space provides a safe working environment in which efforts can be undertaken to defend the structure, before and after the passage of a bush fire (NSW RFS 2019).

5.2.2 OBJECTIVES

Table 5.3a of *Planning for Bushfire Protection 2019* (PBFP) identifies the performance criteria and acceptable solution applicable for determining appropriate APZ's for rural and residential subdivision. These are summarised and addressed in Error! Reference source not found..

Table 1 – Asset Protection Zones

Performance Criteria	Acceptable Solutions	Assessment
Potential building footprints must not be exposed to radiant heat levels exceeding 29 kw/m² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	✓
APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4.	This would be achieved.
The APZs is provided in perpetuity.	APZs are wholly within the boundaries of the development site	This would be achieved.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.	✓
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	– Landscaping is in accordance with appendix 4; and – Fencing is constructed in accordance with section 7.6.	This would be achieved.

5.2.3 REQUIRED SETBACKS

Appendix 1 of PFBP provides the following procedure for determining bush fire attack assessment on a building within a designated bushfire prone area:

1. Determine vegetation formation in all directions around the building to a distance of 140 metres (refer to A1.2).
2. Determine the effective slope of the land from the building for a distance of 100 metres (refer to A1.4 and A1.5).
3. Determine the relevant FFDI for the council area in which the development is to be undertaken (refer to A1.6); and
4. Match the relevant FFDI, vegetation formation and effective slope to determine the APZ required from the appropriate table of this Appendix (refer to A1.7).

In response to point 1, the vegetation within 140 metres of the subject site is grassland. In response to point 2, the average slope for 100 metres around the subject site is 2 percent. In response to point 3, the FFDI for the subject site is 80.

Proposed dwellings would all be located on land is not bushfire prone. **Figure 7** below provides an overlay of the plan of subdivision and the bushfire prone land map. All dwellings on lots within Stage 12 will achieve BAL-LOW or less with reference to Table A1.12.6 (NSW RFS 2019) prior to, and once the surrounding land has been developed.

Figure 7 – Bushfire Prone Land and Subdivision Overlay

With reference to Table A1.12.6 (NSW RFS 2019), all proposed lots will be located in excess of 100 metres from the nearest grassland/ bushfire threat. The land to the west will continue to be developed which will further increase the setback from the proposed lots to the threat of bushfire.

5.3 CONSTRUCTION STANDARDS

Part 2.3.4 of the *Building Code of Australia* states a Class 1 building is constructed in a *designated bushfire prone area* must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes.

Australian Standard A.S. 3959 - 2009 is the enabling standard addresses the performance requirements of Part 2.3.4 of the *Building Code of Australia*.

Therefore, Class 1 buildings within the development shall be constructed to comply with the specifications of this Standard.

Identify construction requirements:

1. Follow steps 1 - 4 in Section 5.2.3 of this report.
2. Determine the separation distance by measuring from the edge of the unmanaged vegetation to the closest external wall.
3. Match the relevant FFDI, appropriate vegetation, distance and effective slope to determine the appropriate BAL using the relevant tables at the end of this section (A1.12.5, A1.12.6 and A1.12.7); and
4. Refer to Section 3 in AS 3959 and NASH Standard to identify appropriate construction requirements for the calculated BAL.

There are five levels of bushfire construction with deemed-to-satisfy arrangements accepted by the NSW Rural Fire Service. These are BAL 12.5; BAL 19; BAL 29, BAL 40 and BAL Flame Zone as defined by A.S 3959 – 2018.

The resulting BAL determines the nature of the construction standard applies to a development by reference to the provisions of AS3595-2018.

The future dwellings on lots within Stage 12C have been calculated to achieve BAL-LOW status. The land subject to Stage 12C is not bushfire prone land and once the development to the west is complete/ has been constructed, there will be even greater separation between the subject site and the bushfire threat.

The Asset Protection Zones provided to the dwellings on all lots have been determined to mitigate the impact of bushfires to the extent radiant heat levels will be less than 29 kW/m2.

5.3.1 ASSOCIATED STRUCTURES

No structures form part of the associated development application.

5.4 ACCESS

PBFP provides control in relation to site access in relation to new roads, property access and fire trails. As no new roads or fire trails are required or proposed, the focus of this element of the assessment is property access.

Table 2 outlines the performance criteria and acceptable solutions for property access. The table also outlines how the proposed development achieves the requirements.

Table 2 – Property Access

Performance Criteria	Acceptable Solutions	Comments	Compliance
ACCESS (GENERAL REQUIREMENTS)			
Firefighting vehicles are provided with safe, all-weather access to structures.	Property access roads are two-wheel drive, all-weather roads;	Individual property access would be addressed in subsequent DAs for dwelling construction on each lot.	✓
	Perimeter roads are provided for residential subdivisions of three or more allotments;	A centre access road is provided with an appropriately managed APZ.	N/A

Performance Criteria	Acceptable Solutions	Comments	Compliance
	Subdivisions of three or more allotments have more than one access in and out of the development;	A single, central access road is provided in the short term. Future access roads will be provided with the development of the estate. The proposed subdivision remains compliant with BFSA issued under the subdivision creating the subject residue lot (DA 0428/2013).	✓
	Traffic management devices are constructed to not prohibit access by emergency services vehicles;	Emergency vehicle access would not be prohibited in any form.	✓
	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;	The grade of the proposed road would not exceed 15 degrees, or an average of 10 degrees.	✓
	All roads are through roads;	The proposed road is not a through road in the short term. Temporary turning heads will be provided, and the road will be continued south to provide additional through roads within the site.	✓
	Dead end roads are not recommended, but if unavoidable, 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:	The proposed road is not greater than 200m. A minimum 12m turning circle would be provided.	✓
	Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road;	A perimeter road is not required or provided to the subject site.	✓
	Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and	Access and egress are achieved via formed public roads.	✓

Performance Criteria	Acceptable Solutions	Comments	Compliance
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	Access road would be two-way and meet the 10m width requirements.	✓
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.	Roads will be constructed to support fully loaded firefighting vehicles (up to 23 tonnes).	✓
There is appropriate access to water Supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;	This will be achieved.	✓
	Hydrants are provided in accordance with the relevant clauses of as 2419.1:2005 - fire hydrant installations system design, installation and commissioning; and	This will be achieved.	✓
	There is suitable access for a category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	This will be achieved.	✓
PERIMETER ROADS			
access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Are two-way sealed roads;	No perimeter roads are proposed	N/A
	Minimum 8m carriageway width kerb to kerb;	As above	N/A
	Parking is provided outside of the carriageway width;	As above	N/A
	Hydrants are located clear of parking areas;	As above	N/A
	Are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	As above	N/A
	Curves of roads have a minimum inner radius of 6m;	As above	N/A

Performance Criteria	Acceptable Solutions	Comments	Compliance
	The maximum grade road is 15 degrees and average grade of not more than 10 degrees;	As above	N/A
	The road crossfall does not exceed 3 degrees; and	As above	N/A
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	As above	N/A
NON-PERIMETER ROADS			
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5m carriageway width kerb to kerb;	Carriageways will achieve the 5.5m minimum.	✓
	Parking is provided outside of the carriageway width;	This will be achieved.	✓
	Hydrants are located clear of parking areas;	This will be achieved.	✓
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	The temporary access arrangement includes a temporary turning head until the road network is complete.	x
	Curves of roads have a minimum inner radius of 6m;	This will be achieved.	✓
	The road crossfall does not exceed 3 degrees; and	This will be achieved.	✓
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	This will be achieved.	✓

5.5 SERVICES

All proposed lots have adequate access to required services (provided by extension of the existing services adjoining the site).

The intent of the measures for services, including water, electricity and gas 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.* (NSW RFS 2019:47).

Table 3 outlines the performance criteria and acceptable solutions for services.

Table 3 – Services

Performance Criteria	Acceptable Solutions	Comments	Compliance
WATER SUPPLIES			

Performance Criteria	Acceptable Solutions	Comments	Compliance
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development where available;	The site is located in an area with existing reticulated water availability.	✓
	A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and	Reticulated water would be provided.	N/A
	Static water supplies shall comply with Table 5.3d.	This would be addressed during development of each individual lot.	N/A
– Water supplies are located at regular intervals; and – The water supply is accessible and reliable for firefighting operations	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian standard as 2419.1:2005;	This will be achieved.	✓
	Hydrants are not located within any road carriageway; and	This will be achieved.	✓
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	This will be achieved.	✓
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses. Of as 2419.1:2005.	This will be achieved.	✓
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps; and	All pipes will be underground.	N/A
	Above-ground water storage tanks shall be of concrete or metal.	N/A	N/A
ELECTRICITY SERVICES			
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground;	This will be achieved.	✓
	Where overhead, electrical transmission lines are proposed as follows: – Lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and – No part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing	No overhead power lines ae proposed.	N/A

Performance Criteria	Acceptable Solutions	Comments	Compliance
	Vegetation Near Power Lines.		
GAS SERVICES			
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with as/nzs 1596:2014 - the storage and handling of lp gas, the requirements of relevant authorities, and metal piping is used;	This will be achieved.	✓
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;	Gas connections to buildings do not form part of the proposal.	N/A
	Connections to and from gas cylinders are metal;	Gas connections to buildings do not for part of the proposal.	N/A
	Polymer-sheathed flexible gas supply lines are not used; and	Gas connections to buildings do not for part of the proposal.	N/A
	Above-ground gas service pipes are metal, including and up to any outlets.	Gas connections to buildings do not for part of the proposal.	N/A

5.6 ON-GOING MANAGEMENT

On-going maintenance of the APZs (if required) is to ensure regrowth and fuel load replacement does not occur. This will be the responsibility of the property owners and would be required as a condition of consent for dwellings on the proposed lots and imposed as a restriction to user on new land titles.

As noted, each lot created with this development will be cleared of any vegetation. Any future landscaping of each lot will be maintained to ensure there is no fuel load present.

6. CONCLUSION

As the subject site has been identified as being partly bushfire prone land, an assessment of the site has been undertaken in accordance with PBFP (NSW RFS 2019). The results of this assessment are outlined in this report indicate the site is suitable for the proposed residential development from a bushfire perspective. Each lot is capable of achieving compliance with the requirements of PBFP.

7. REFERENCES

Table 4 – References

Mecone *Mosaic* [ONLINE] Available at: https://www.mecone.com.au/mosaic/ [Accessed 15 March 2021]
NSW Department of Planning and Environment (DoPE), n.d. NSW Planning Portal. [ONLINE] Available at: https://www.planningportal.nsw.gov.au/ [Accessed 20 October 2020}
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