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BUSHFIRE ASSESSMENT REPORT

Site Specific Bushfire Hazard Assessment

Site Address

156 Ainsworth Road, MONGOGARIE

Lot and DP

9//755625

Client

A. & J. Bevan & M. Ludlow

Local Government Area

Richmond Valley

Proposed Development

Dwelling House with Secondary Dwelling House

Commissioned by

Metricon Homes

Assessment Date

22/11/2023

Reference Number

23110582

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DISCLAIMER

This report was prepared for the purposes and exclusive use of the stated client to accompany an application to the relevant Council for the specified development application and is not to be used for any other purpose or by any other person or corporation.

This report is prepared on the basis the subject land is identified to be 'at risk' of bushfire. Any buildings or structures located on such land subsequently inherit this risk. This report does not seek to remove this risk, but provide detailed siting, layout, building and / or servicing information to assist the ability of the land-owner to manage the threat of this risk.

The information contained in this report is based on independent research undertaken by Senica Consultancy Group. To the best of our knowledge, it does not contain any false, misleading or incomplete information.

Senica Consultancy Group accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may rely on or use this report in contravention of the terms of this clause.

The report has been based on the relevant Council, NSW Government and NSW Rural Fire Service Guidelines; however, recommendations given in this report are based on a site inspection at the time of this report.

However, it is important to note that whilst bushfires generally maintain certain scientific attributes, bushfire events vary in intensity, duration, location and 'typical' behavioural characteristics. Bushfires do not always conform to scientific and widely-understood predictabilities and remain subject to variation across fire seasons by virtue of changes in ground fuel loads and vegetation, prevailing weather and wind conditions and topography.

In some cases site conditions may change dramatically due to rapid vegetation growth or re-growth and invading weed species.

This report is dependent on ongoing maintenance of building materials, asset protection zones, water supply and landscaping as recommended in this report.

The content of this report is based on the assumption, as per the provisions of *Planning for Bushfire Protection 2019*, that all doors and windows will be closed during a bushfire event.

It remains the land owner's responsibility to understand and prepare for the event of bushfire, which requires year-round property maintenance, a proficient understanding of local bushfire knowledge and what to do in the event of a bushfire. A personal bushfire safety plan is recommended, and decisions regarding what to do in an event should be made well in advance of any particular bushfire threat. Regular contact with your local fire authority is advised.

Senica Consultancy Group does not accept responsibility for how the information within this report is applied or relied upon.

Whilst every care has been taken in the preparation of this report to advise upon the bushfire risk of the property, it forms no guarantee with respect to the safeguard of life and property.

EXECUTIVE SUMMARY

Senica Consultancy Group has been commissioned by A. & J. Bevan & M. Ludlow to prepare a Bushfire Threat Assessment for a Development Application to Richmond Valley Council for the proposed Residential Development on Lot 9 in DP 755625, 156 Ainsworth Road, Mongogarie.

The development proposal is for the construction of a dwelling house with an attached garage, unattached secondary dwelling house and ancillary site works.

The development site is located on the northern side of Ainsworth Road. The subject site is in a well established rural area. The proposed building site is generally sloped and has been cleared of significant vegetation.

The land surrounding the proposed building site has areas of classified vegetation. This area contains Category 1 Bushfire Prone Vegetation and the 100 metre wide buffer zone to the bushfire prone vegetation impacts upon the subject site.

A large section of this vegetation has been removed for residential purposes.

The development, involving the construction of a dwelling house with an attached garage within a bushfire prone area is required to comply with the provisions of Section 4.14 of the Environmental Planning & Assessment Act 1979 and provide bushfire protection measures in accordance with Planning for Bushfire Protection 2019.

The provisions of Section 100B of the Rural Fires Act 1997 apply to Infill Development and the development is required to comply with the deemed-to-satisfy provisions of Planning for Bushfire Protection 2019.

This report therefore examines the proposed development against these requirements and provides advice on the suitability of the development in addressing the availability of complying Asset Protection Zones/Defendable Spaces, access and water supplies for fire-fighting operations and the requisite level of construction to the building in order to address the potential levels of radiant heat exposure on the building.

1 INTRODUCTION

This report has been prepared on behalf of A. & J. Bevan & M. Ludlow, to provide supporting information to enable Council and the NSW Rural Fire Service to assess the proposal against the requirements of section 4.14 of the Environmental Planning and Assessment Act 1979 and Planning for Bushfire Protection 2019.

This report is prepared for the proposed construction of a dwelling house with an attached garage on a developed allotment with a dwelling entitlement.

1.1 SUMMARY

The purpose of this report is to establish suitable measures to provide bushfire mitigation in order for Council to make a determination of the proposed development pursuant to the requirements of section 100B of the *Environmental Planning and Assessment Act 1979*.

This report addresses the matters identified in Appendix 2 of *Planning for Bushfire Protection 2019*. The report will demonstrate that the proposal satisfies the aims and objectives of *Planning for Bushfire Protection 2019* through compliance with the performance criteria of section 6.2 of *Planning for Bushfire Protection 2019*.

The specific objectives for infill development are listed as:

- Provide a defensible space to enable unimpeded access for firefighting around the building;
- Provide better bush fire outcomes on a redevelopment site than currently exists, commensurate with the scale of works proposed;
- Design and construct buildings commensurate with the bush fire risk;
- Provide access, services and landscaping to aid firefighting operations;
- Not impose an increased bushfire management responsibility on adjoining landowners; and
- Increase the level of bushfire protection to existing dwellings based on the scale of the proposed work and level of bush fire risk.

The proposed development is classified as infill development and will require specific assessment to analyse the risk and the requirements to limit the risk of damage and/or ignition of the dwelling during a bushfire event.

The recommendations within this report address the aims and objectives of *Planning for Bushfire Protection 2019*, utilising the prescriptive requirements of Australian Standard 3959:2018.

It is to be noted that bushfires are a natural phenomenon, which can be largely unpredictable and uncontrollable. There can be no guarantee that a building or its occupants will not be adversely affected during a bushfire event.

1.2 STATUTORY REQUIREMENTS

This report has been prepared having regard to the following legislative and planning requirements:

1.2.1 LEGISLATION

(A) ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (EPA ACT)

Planning and development within NSW is regulated by the Environmental Planning & Assessment Act, 1979 (EPA Act). This Act was amended in August 2002 by the Rural Fires & Environmental Assessment Legislation Amendment Act, 2002. In relation to bushfire planning for new residential, rural residential and special fire protection developments in bushfire prone areas in NSW, the following sections of the Act apply:

(i) Section 4.14:

Section 4.14 requires a consent authority to determine if a proposed development that is located within a designated Bushfire Prone Area, or the buffer zone to the Bushfire Prone Land, complies with Planning for Bushfire Protection 2019.

(ii) Section 4.15:

“In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

- The likely impacts of the development (e.g. natural hazards such as bushfire threat);
- The suitability of a site for development (e.g. bushfires)

(B) RURAL FIRES ACT 1997

The objectives of the Rural Fires Act are to provide:

- The prevention, mitigation and suppression of fires;
- Coordination of bushfire fighting and prevention
- Protection of people and property from fires; and
- Protection of the environment.

In relation to the management of bushfire fuels on public and private lands within NSW, Sections 63(1) and 63(2) require public authorities and owners / occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimize the danger of, the spread of bushfires.

(C) RURAL FIRES REGULATION 2008.

Section 44 of the Rural Fires Regulation 2008 relates to planning for new residential, rural residential and special fire protection purpose developments in bushfire prone areas in NSW and provides details of the matters that are required to be addressed for the issue of a Bushfire Safety Authority under Section 100B of the Rural Fires Act.

(D) THREATENED SPECIES CONSERVATION ACT 1995 (TSC ACT).

The TSC Act aims to protect and encourage the recovery of threatened species, populations and communities as listed under the Act.

The TSC Act is integrated with the EP&A Act and requires consideration of whether a development or an activity (such as the implementation of hazard reduction and asset protection) is likely to significantly affect threatened species, populations and ecological communities or their habitat.

1.2.2 PLANNING POLICIES*PLANNING FOR BUSHFIRE PROTECTION – 2019*

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for development in bushfire prone areas.

In addition to the provisions of the *Planning for Bushfire Protection 2019* document, the Commissioner may determine, under Section 100B of the *Rural Fires Act*, additional measures for rural residential and residential subdivisions and ‘*Special Fire Protection Purpose*’ development that are considered necessary to protect the development against the impact of bushfire.

2 SITE CHARACTERISTICS

2.1 SITE DESCRIPTION

The site is identified legally as Lot 9 of Deposited Plan 755625. It is commonly known as 156 Ainsworth Road, Mongogarie. The subject site has an area of 39.15 hectares.

Please refer to the below cadastral image.

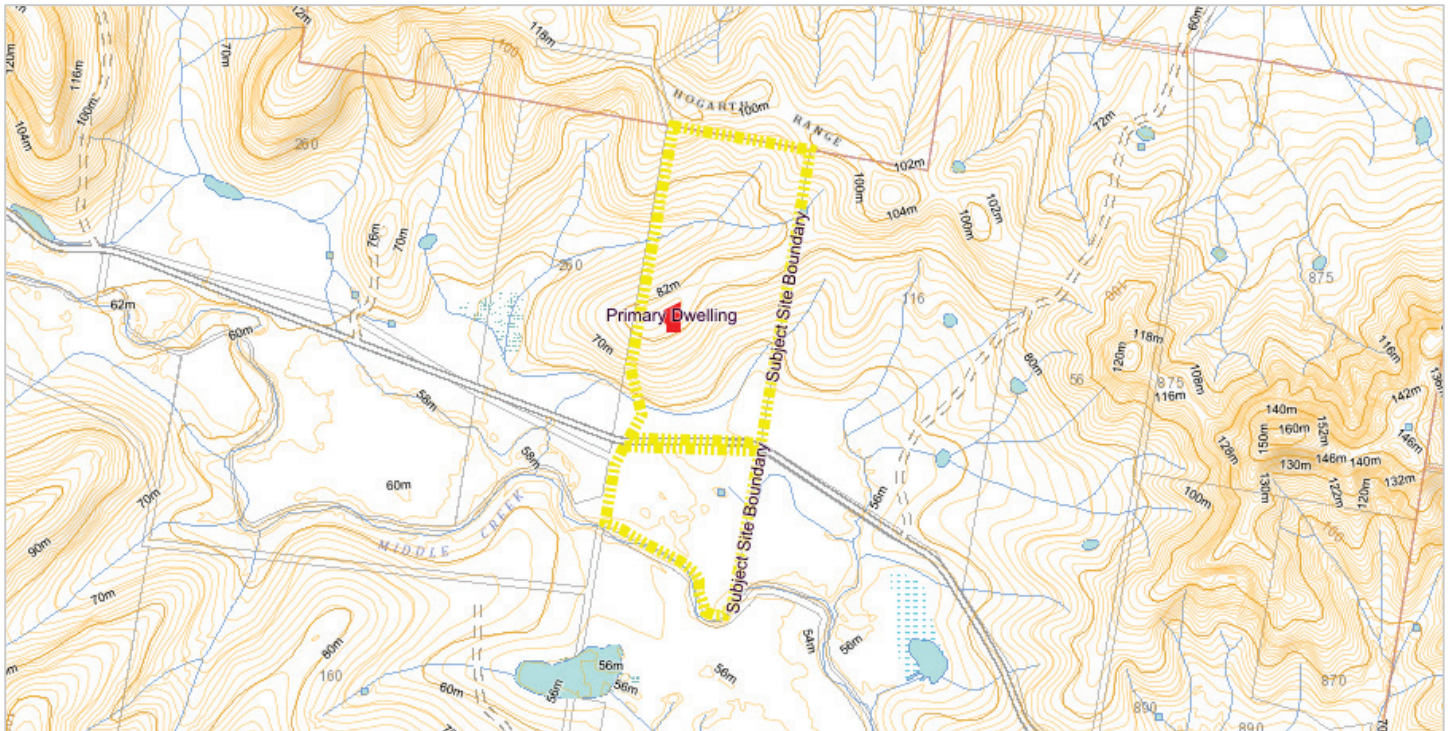


Figure 1 - Subject Site

2.2 SITE ANALYSIS

A site analysis has been prepared for the proposed development.

2.2.1 SITE AND DRAWING DESCRIPTION

The plans submitted as part of the development application clearly indicate the location of site boundaries, navigational bearings which include a north point, dimensions of the subject site, scale and date of the relevant drawings, noting any amendments and their dates.

2.2.2 SITE DETAILS

Sheet 1 of the submitted plans, which forms part of this development application, clearly identifies topographical elements with contours and levels identified at 250mm intervals.

The location of essential services such as reticulated water, Council sewer lines, electrical and telecommunication infrastructure are clearly identified on the aforementioned sheet.

The overland flow of stormwater is anticipated to follow the contours of the site under gravity. Sufficient stormwater control infrastructure will be installed on site consistent with the expectations for a residential dwelling with a similar slope of the subject site.

Stormwater will be contained within the site with no flows directed onto adjoining properties. Where possible stormwater will be collected on site or directed to the landscaped area to be absorbed on site.

2.2.3 SITE CLIMATIC DETAILS

The orientation of the site including solar paths for summer and winter and the prevailing wind directions has been included in the submitted plans.

2.2.4 SITE CONTEXT

The subject site is in a well established rural agricultural area. The property has street frontage to Ainsworth Road, which runs largely parallel to the southern-most property boundary of the northern section of the subject site.

Adjoining properties are undeveloped and as such adjacent buildings and existing fences are not identified in the submitted plans. It is anticipated that once the proposed development will be consistent with the expectations for development in the area.

The subject site is identified as being Bushfire prone as per Council's records.

2.3 SURROUNDING LAND-USE

The land is situated within a residential subdivision which is characterised by a mix of single and multi-storey residential dwellings. The adjoining and adjacent land uses include:

- Residential buildings
- Nearby Scrubland
- Open Pasture land

3 DESCRIPTION OF PROPOSAL

3.1 PROPOSED DEVELOPMENT

The proposed development includes the construction of a dwelling house with an attached garage, unattached secondary dwelling and ancillary site works.

The buildings will be brick veneer cladding with a metal sheet roof and concrete slab on ground construction.

3.2 SITE ACCESS

Vehicular access to the site is via a formed driveway from Ainsworth Road. Ainsworth Road is a formed maintained roads and are consistent with the provisions of *Planning for Bushfire Protection 2019*.

An access road consistent with the provisions of Planning for Bushfire Protection 2019 is to be created as part of the proposed development.

It is contended that the Access is consistent with Table 5.3b of Planning for Bush Fire Protection.

3.3 SITE SERVICES

The site has access to limited access to electricity and telecommunications infrastructure. The site is not connected to Council's reticulated sewer or water infrastructure. Large rainwater tanks are present on the site with additional large rainwater tanks to be constructed and installed on the site consistent with the requirements of *Planning for Bushfire Protection*.

4 BUSHFIRE PROTECTION MEASURES

4.1 BUSHFIRE ATTACK LEVEL ASSESSMENT METHODOLOGY

4.1.1 BUSHFIRE ATTACK LEVEL ASSESSMENT METHODOLOGY

Assessment methodology for the subject site has been conducted in accordance with a Method 1 Assessment per the Australian Standard 3959:2018; *Construction of buildings in Bushfire-prone areas* including amendments, with reference to and as modified by *Planning for Bushfire Protection 2019*.

4.1.2 DESKTOP ASSESSMENT

A desktop assessment of the subject site and surrounds using high resolution imagery was conducted to broadly assess the site characteristics and relevant information. FireMaps NSW and ePlanning Spatial Viewer were utilised to produce site-specific Bushfire Prone Area mapping, site topography and vegetation hazard class mapping as per Planning for Bushfire Protection. This is followed by an on-site field assessment and verification.

4.1.3 FIELD VERIFICATION

A site assessment was conducted by Senica Consultancy Group staff on 15th of November 2023. The site inspection was conducted to make a visual assessment of the subject site, and surrounds and quantitatively assess the bushfire hazard, slope, aspect, vegetation and associated risk.

4.2 SITE ASSESSMENT

The subject site is a newly created lot within a well established rural area. The proposed building site has a slight slope and has been cleared of significant vegetation. The site is bordered to the south by a formed road and on the other three property boundaries by rural properties.

The subject site is identified as being Bushfire prone as per Council's records.

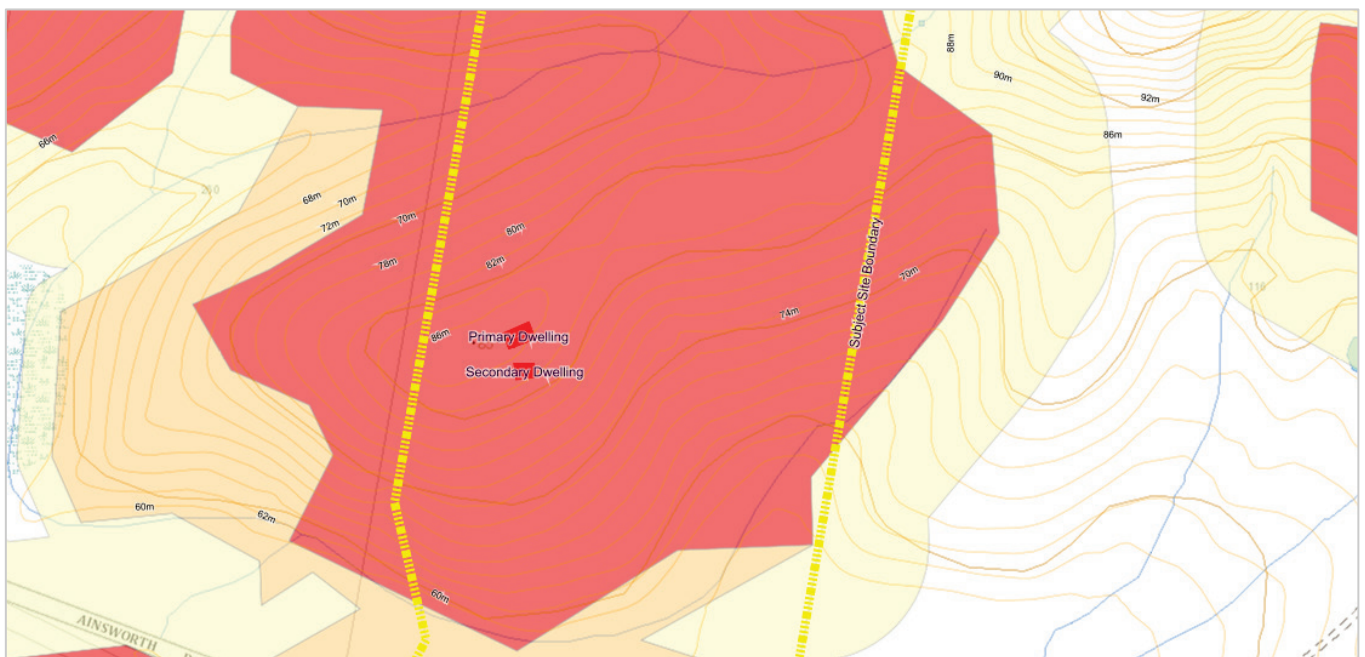


Figure 2 - Bushfire Prone Vegetation Mapping

The Bushfire Prone Land Map has been certified by the NSW Rural Fire Service and is based on specifications provided by the Service.

Within the Map are three vegetation categories:

VEGETATION CATEGORY 1 (HIGH RISK)

Vegetation Category 1 is considered to be the highest risk for bush fire. It is represented as red on the bush fire prone land map and will be given a 100m buffer. This vegetation category has the highest combustibility and likelihood of forming fully developed fires including heavy ember production.

Vegetation Category 1 consists of areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations.

VEGETATION CATEGORY 2 (LOW RISK)

Vegetation Category 2 is considered to be a lower bush fire risk than Category 1 and Category 3 but higher than the excluded areas. It is represented as light orange on a bush fire prone land map and will be given a 30 metre buffer. This vegetation category has lower combustibility and/or limited potential fire size due to the vegetation area shape and size, land geography and management practices.

Vegetation Category 2 consists of:

- Rainforests;
- Lower risk vegetation parcels. These vegetation parcels represent a lower bush fire risk to surrounding development and consist of:
 - Remnant vegetation;
 - Land with ongoing land management practices that actively reduces bush fire risk. These areas must be subject to a plan of management or similar that demonstrates that the risk of bush fire is offset by strategies that reduce bush fire risk; AND include:
 - Discrete urban reserve/s;
 - Parcels that are isolated from larger uninterrupted tracts of vegetation and known fire paths;
 - Shapes and topographies which do not permit significant upslope fire runs towards development;
 - Suitable access and adequate infrastructure to support suppression by firefighters;
 - Vegetation that represents a lower likelihood of ignitions because the vegetation is surrounded by development in such a way that an ignition in any part of the vegetation has a higher likelihood of detection.

VEGETATION CATEGORY 3 (MEDIUM RISK)

Vegetation Category 3 is considered to be medium bush fire risk vegetation. It is higher in bush fire risk than category 2 (and the excluded areas) but lower than Category 1. It is represented as dark orange on a Bush Fire Prone Land map and will be given a 30 metre buffer.

This category consists of grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands.

VEGETATION BUFFER

The Vegetation Buffer spatially represents the associated 100 m and 30 m buffers from Vegetation Categories 1, 2 and 3 respectively.

The NSW Bushfire Prone Land Mapping was used to determine the preliminary bushfire hazard categories of the vegetation within 140m of the proposed building sites.

The subject site is affected by Vegetation Category 1 (High Risk) and its related buffer areas.

Accordingly, further investigations of the site-specific bushfire hazard characteristics has been undertaken to determine the potential hazard of the subject site and locality, in accordance with the NSW Planning for Bushfire Protection 2019.

Large areas of the classified vegetation have been removed prior to the site inspection.

4.2.1 FOREST FIRE DANGER INDEX (FFDI)

Forest Fire Danger Index (FFDI) is a measure of many variables that originate from weather that are known to influence fire behaviour such as recent rainfall, current wind speed and direction, relative humidity and temperature.

Due to the complexity of these variables, they are commonly combined to provide a single weather index that can be used to estimate potential fire behaviour. The McArthur Forest Fire Danger Index is a commonly used fire weather index adopted by fire authorities Australia and used in regulatory instruments including AS3959:2018 and Planning for Bushfire Protection.

AS3959:2018 prescribes an FFDI of 80 for the majority of NSW outside of Greater Sydney, Greater Hunter, Illawarra, Far South Coast and the Southern Ranges.

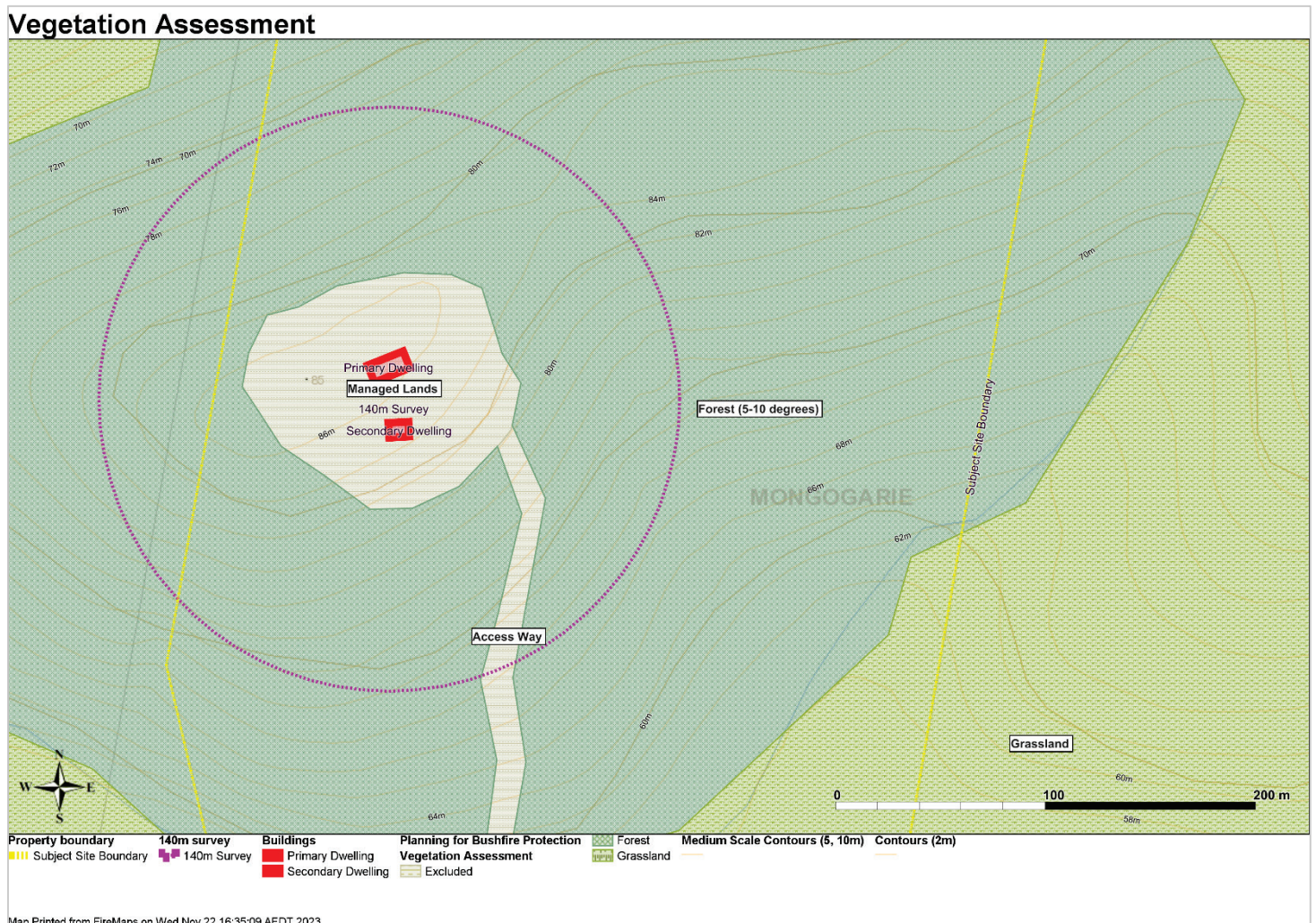


Figure 3 - 140m Vegetation Survey

4.2.2 VEGETATION

All vegetation within 140m of the proposed building site has been assessed and classified as per the provisions of Planning for Bushfire Protection.

The following vegetation was identified via Council's aerial photography:

- Managed lands;
- Dry Sclerophyll Forests.



Figure 4 - Classified vegetation

Council's mapping identifies one area of classified bushfire prone land to the east of the subject site. These areas have largely been cleared as part of the subdivision process, creating an area of cleared land between the subject site and the classified vegetation.

Aerial photography and mapping show the classified vegetation extending away from the subject site to the north.

The classified vegetation to the east is identified in Council's 2008 Vegetation mapping as North Coast dry Sclerophyll Forest.

Dry Sclerophyll Forest is defined in *Planning for Bushfire Protection 2019*, as being "Open tree canopy dominated by eucalypt species (typically 10- 30m in height) with crowns that touch and overlap. Canopy allows most sunlight to penetrate supporting growth of a prominent understorey layer varying between hard-leaved shrubs to luxuriant soft leaved shrubs, ferns and herbs.

This is an accurate representation of classified vegetation viewed during the site inspection.

4.2.3 SLOPE ASSESSMENT

Slope assessment is derived from the most detailed contour data available, such as topographic maps displaying contour intervals determined when the land is surveyed.

A desktop assessment of the subject site identified that the site was considered to be generally sloped across its length and the classified vegetation was upslope of the subject site. A site inspection of the classified vegetation determined that this was accurate, with the land generally sloping upwards, away from the subject site.



Figure 5 – Subject Site

4.3 ASSET PROTECTION ZONES

The intent of Asset Protection Zones is to provide sufficient space and maintain reduced fuel loads, so as to ensure the radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.



Asset Protection Zones are established and maintained to ensure that bushfire fuels are progressively reduced between the development and the bushfire hazard.

Table 5.3a of *Planning for Bushfire Protection 2019* identifies methods for compliance with the relevant performance criteria. Please refer to Table 2 below.

Table 1 - Performance Criteria

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
Asset Protection Zones APZs are provided commensurate with the construction of the building; and A defensible space is provided.	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.
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 of PBP.
The APZs is provided in perpetuity	APZs are wholly within the boundaries of the development site
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.

Home-based child care: the building must not be exposed to radiant heat levels exceeding 29kW/m² (1090K). an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.

Table A2.5 of *Planning for Bushfire Protection* identifies the required minimum specification for Asset Protection Zones, for Class 1 buildings, in FDI 80 Fire Areas, to have the APZ designated in Table 3.

Table 2

Aspect	Slope (°)	Vegetation Classification	Required APZ (m)	Description
N	5 – 10	Forest	31	APZ achievable within the site.
E	5 – 10	Forest	31	APZ achievable within the site.
S	5 – 10	Forest	31	APZ achievable within the site.
W	5 – 10	Forest	31	APZ achievable within the site.

As per the above Table, the proposed development requires a 31 metre APZ as per the provisions of Table A1.12.3 in *Planning for Bush Fire Protection*. This APZ is to be established around each dwelling and maintained in perpetuity.

The area around the proposed dwellings is considered to be able to be maintained in a low fuel state which satisfies the requirements for an APZ and it is considered that this state will be maintained in perpetuity in accordance with the provisions of Appendix 4 of *Planning for Bush Fire Protection 2019*.

Given that the classified vegetation is identified as Forest, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA). These requirements are identified as per below:

Table 3 - IPA and OPA requirements

Requirements	
Inner Protection Area	<p>Trees</p> <ul style="list-style-type: none"> 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.
	<p>Shrubs</p> <ul style="list-style-type: none"> 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.
	<p>Grass</p> <ul style="list-style-type: none"> 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.
Outer Protection Area	<p>Trees</p> <ul style="list-style-type: none"> tree canopy cover should be less than 30%; and canopies should be separated by 2 to 5m.
	<p>Shrubs</p> <ul style="list-style-type: none"> shrubs should not form a continuous canopy; and shrubs should form no more than 20% of ground cover.
	<p>Grass</p> <ul style="list-style-type: none"> grass should be kept mown to a height of less than 100mm; and leaf and other debris should be removed.

It is considered that the proponent would be able to achieve the APZ requirements as per the provisions of Planning for Bushfire within the subject site.

Landscaping is identified as being a major factor in determining the level of possible impact from a bushfire event on a dwelling and its occupants. The majority of dwellings impacted during bushfire events are the result of ember attack.

Therefore landscaping surrounding the house can play a significant role in reducing the potential for impact on the building from a bushfire. It follows that management of this landscaping is just as important.

It is anticipated that in the proposed residential subdivision and any future development landscaping is in accordance with Appendix 4 and any fencing is constructed in accordance with section 7.6 of Planning for Bush Fire Protection.

This is achievable through conditioning of the proposed Development Consent and any future Development Consent.

4.3 ACCESS

Access is required to meet an adequate level of performance to allow emergency services vehicles to gain access to the development for the purpose of property protection and evacuation procedures for occupants and fire fighting personnel.

Performance Criteria		Acceptable Solutions
The intent may be achieved where:		
Access	Firefighting vehicles are provided with safe, all-weather access to structures	property access roads are two-wheel drive, all-weather roads.
	The capacity of access roads is adequate for firefighting vehicles.	the capacity of 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.
	There is appropriate access to water supply.	<ul style="list-style-type: none"> hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

firefighting vehicles can access the dwelling and exit the property safely.

at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;

There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.

In circumstances where this cannot occur, the following requirements apply:

- minimum 4m carriageway width;
- in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;
- property access must provide a suitable turning area in accordance with Appendix 3;
- curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;
- the minimum distance between inner and outer curves is 6m;
- the crossfall is not more than 10 degrees;
- maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and
- a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way.

Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.

The proposed access incorporates utilising the public road system. The proposed access road from Emu Park Road to the proposed building site are proposed to be two wheel drive accessible, all weather roads with no traffic management devices proposed as part of the proposed development.

As the subject site is located in a forest situations, the access road is to have a passing bay every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;

The access road is to be a minimum of 4m carriageway width, with a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. Curves are to have a minimum inner radius of 6m and a minimal in number.

The proposed access road is to have a maximum grade of 10 degrees and 5 degrees of crossfall.

The access road to the subject site are 8m wide carriageway width from kerb to kerb. They are designed and constructed in manner consistent with the requirements to carry fully loaded firefighting vehicles (up to 23 tonnes).

Parking is anticipated to be provided within the residential lot in a garage appurtenant to the proposed future dwelling house with additional visitor carparking provided in a stacked arrangement in front of the anticipated garage.

The existing roads have a maximum grade of less than 15 degrees and an average grade of less than 10 degrees. The cross fall of the roads does not exceed 3 degrees and a minimum vertical clearance of four metres to any overhanging obstructed shall be provided.

It is considered that the proposed development satisfies and is able to achieve the acceptable solutions for access.

4.4 WATER AND UTILITY SERVICES

Adequate and reliable water supply is generally acknowledged as an integral part of fighting and preventing the spread of bushfires. The protection of electrical supply is critical in preventing the change of further ignition by sparking as well as ensuring the protection and safety of occupants during an evacuation.

Performance Criteria		Acceptable Solutions
The intent may be achieved where:		
Water Supplies	An adequate water supplies is provided for firefighting purposes.	reticulated water is to be provided to the development where available; and a static water supply is provided where no reticulated water is available.
	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; hydrants are not located within any road carriageway; and reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
	Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.
	The integrity of the water supply is maintained.	all above-ground water service pipes are metal, including and up to any taps; and above-ground water storage tanks shall be of concrete or metal.
	a static water supply is provided for firefighting purposes in areas where reticulated water is not available.	where no reticulated water supply is available water for firefighting purposes is provided in accordance with Table 5.3d; a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet; ball valve and pipes are adequate for water flow and are metal; supply pipes from tank to ball valve have the same bore size to ensure flow volume; underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank;

		<p>a hardened ground surface for truck access is supplied within 4m;</p> <p>above-ground tanks are manufactured from concrete or metal;</p> <p>raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959);</p> <p>unobstructed access can be provided at all times;</p> <p>underground tanks are clearly marked;</p> <p>tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;</p> <p>all exposed water pipes external to the building are metal, including any fittings;</p> <p>where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and</p> <p>fire hose reels are constructed in accordance with installed in accordance with the relevant clauses of AS 2441:2005.</p>
Electricity Services	location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	<p>where practicable, electrical transmission lines are underground;</p> <p>where overhead, electrical transmission lines are proposed as follows:</p> <ul style="list-style-type: none"> o lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and o no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing 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.	<p>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;</p> <p>all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;</p> <p>connections to and from gas cylinders are metal;</p> <p>polymer-sheathed flexible gas supply lines are not used; and</p> <p>above-ground gas service pipes are metal, including and up to any outlets.</p>

The property does not have access to reticulated water supplied by the water authority. Concrete or steel rainwater tanks are proposed as part of the development.

One rainwater tank consistent with the provisions of PBP with a minimum volume of 20 kilolitres will be fitted with a 65mm STORZ ball gate fitting and be dedicated to firefighting purposes.

Any above ground water service lines in the proposed development or any future proposed development are to be metal, including and up to any taps.

Where practicable, electrical transmissions lines will be underground. Where this can not practicably be achieved, they will be compliant with the requirements of Planning for Bush Fire Protection 2019.

Electrical transmission lines and water supply lines will be located underground. Gas services will be installed and maintained in accordance with AS1596-2002 and the provisions of PBP.

It is considered that the proposed development can achieve the acceptable solutions.

4.5 CONSTRUCTION STANDARDS

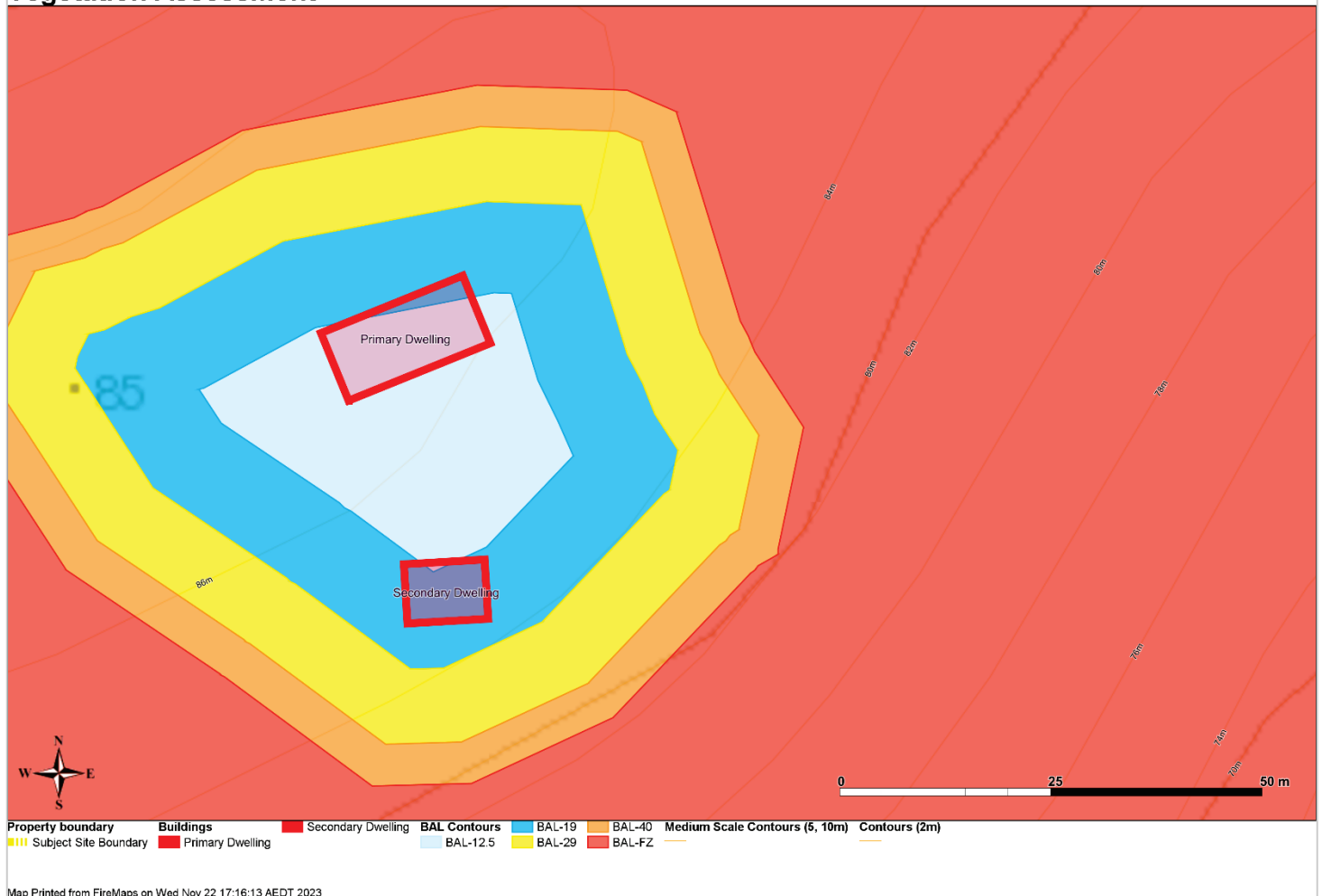
The proposed future dwelling on the subject site is required to be able to withstand bushfire attack in the form of embers, radiant heat and flame contact. This is achieved by determining the required Bushfire Attack Level (BAL) in accordance with the provisions of Clause 7.7 and Tables A1.12.5-A1.12.7 of *Planning for Bush Fire Protection 2019*.

The construction requirements of AS3959:2018 *Construction of Buildings in Bushfire Prone Areas*, are accepted by *Planning for Bushfire Protection* as the deemed to satisfy construction standards for buildings in designated bushfire prone areas.

Construction standards, consistent with AS3959:2018 are applied to buildings to resist, as best possible, the impact of ember attack, direct flame and radiant heat.

Performance Criteria		Acceptable Solutions
The intent may be achieved where:		
Construction Standards	the proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).
	proposed fences and gates are designed to minimise the spread of bush fire.	fencing and gates are constructed in accordance with section 7.6.
	proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2.
	Home-based child care: the proposed building can withstand bush fire attack in the form of wind, localised smoke, embers and expected levels of radiant heat.	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure; and the existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.

Vegetation Assessment



The construction standards for the proposed dwelling have been determined in accordance with Tables A1.12.5 to A1.12.7 of Planning for Bushfire Protection. These are identified in table below.

Aspect	Vegetation Classification	Distance to Hazard (m)	Slope under Hazard (°)	APZ Required	APZ Achievable	BAL Rating
N	Forest	41	5 - 10	31	Yes	BAL-29
E	Forest	34	5 - 10	31	Yes	BAL-29
S	No Vegetation	35	5 - 10	31	Yes	BAL-29
W	No vegetation	38	5 - 10	31	Yes	BAL-29

4.6 LANDSCAPING

Landscaping is identified as being a major factor in determining the level of possible impact from a bushfire event on a dwelling and its occupants. The majority of dwellings impacted during bushfire events are the result of ember attack.

Therefore landscaping surrounding the house can play a significant role in reducing the potential for impact on the building from a bushfire. It follows that management of this landscaping is just as important.

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
Construction Standards	<p>landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.</p> <p>compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4);</p> <p>a clear area of low-cut lawn or pavement is maintained adjacent to the house;</p> <p>fencing is constructed in accordance with section 7.6; and</p> <p>trees and shrubs are located so that:</p> <ul style="list-style-type: none"> • the branches will not overhang the roof; • the tree canopy is not continuous; and • any proposed windbreak is located on the elevation from which fires are likely to approach.

It is recommended that any vegetation and landscaping is completed in accordance with NSW RFS 'Asset protection zone standards' and Appendix 4 of *Planning for Bushfire Protection 2019*. Any vegetation or landscaping is to be managed and maintained in a manner consistent with the above document in perpetuity.

4.7 EMERGENCY MANAGEMENT

The intent of Emergency Management planning is to provide suitable Emergency and evacuation arrangements of occupants within Bushfire prone areas. Early warning and egress are both strongly identified as preferable solutions to surviving a possible bushfire event.

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Emergency Management</p>	<p>Home-based child care: a bush fire emergency and evacuation management plan is prepared.</p> <p>a Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: A</p> <p>Guide to Developing a Bush Fire Emergency Management and Evacuation Plan, and the AS 3745:2010.</p>

Emergency planning arrangements are not required for residential infill developments. However, anyone living in a bush fire prone area should prepare a Bush Fire Survival Plan.

Adequate means for escape and egress are considered to be present for the subject site, however bushfires are unpredictable in nature. It is therefore recommended that the owner develops a bushfire survival plan with respect to the site.

The decision to stay and defend or to leave should be made well in advance of the arrival of the bushfire and current and any future owners should consider triggers such as extreme or catastrophic days to enable early evacuation.

It is highly recommended that a bushfire survival plan is created for all developments situated on BFPL. A plan can be downloaded via www.rfs.nsw.gov.au/resources/bush-fire-survival-plan.

5 CONCLUSION

It is considered that this report has satisfactorily addressed the issues required by section A4.1 of Planning for Bushfire Protection 2019.

Adequate means of access/egress and reticulated water are available to the site, whilst a potentially defensible space is provided around the building with a means of escape available in a worst case scenario.

It is regarded that the following summary of recommendations will satisfy the minimum requirements to address the aims and objectives of Planning for Bushfire Protection 2019.

The following recommendations are made to reduce the potential for ignition of the proposed dwelling and to promote the safety of occupants and emergency services personnel during a bushfire event.

Recommendations:

1. That an area around each dwelling with a minimum distance of 31 metres shall be established as an APZ, in accordance with Appendix 4 of Planning for Bushfire Protection and related standards, and maintained in perpetuity.
2. The proposed buildings are to be constructed in accordance with the requirements of BAL-29 as per the provisions of AS3959-2018.
3. Any electricity supply work shall comply with the requirements of Table 7.4a of Planning for Bushfire Protection, as follows:
 - a. Where practical, electrical transmission lines are underground,
 - b. Where overhead, electrical transmission lines are proposed as follows:
 - i. Lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian zones, and
 - ii. No part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 – Guideline for Managing Vegetation Near Power Lines.
4. Any gas service which is installed must satisfy the following:
 - a. Reticulated or bottled gas installed and maintained in accordance with AS 1596 with metal piping used;
 - b. Fixed gas cylinders to be kept clear of flammable material by a distance of 10m and shielded on the hazard side of the installation;
 - c. Gas cylinders close to the dwelling are to have the release valves directed away from the building and at least 2 (two) metres from flammable material with connections to and from the gas cylinder being of metal;
 - d. Polymer sheathed flexible gas supply lines to gas meters adjacent to the building are not used.
5. All new fences in bush fire prone areas should be made of either hardwood or non-combustible material. Where the fence is within 6m of the building or in areas of BAL 29, they should only be made of non-combustible material.
6. Landscaping surrounding the existing dwelling is to be undertaken in accordance with Appendix 4 of Planning for Bushfire Protection 2019 and managed and maintained in perpetuity.
7. Owners to prepare a Bushfire Evacuation Plan in accordance with NSW Rural Fire Services “A guide to Developing a Bushfire Evacuation Plan”.

6 REFERENCES

- Australian Building Codes Board (ABCB). (2011). *The Building Code of Australia*. Canberra: Australian Building Codes Board.
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- New South Wales Rural Fire Service. (2019). *Planning for Bushfire Protection, A guide for Councils, planners, fire authorities and developers*. Sydney: NSW Rural Fire Service.
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